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THE MAGICAL CURATIVE POWER OF WATER

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday,
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by

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I promised to read you an extract of Dr. Wiley's account of the Cola drinks you are buying so much of at the soda fountains nowadays. Dr. Wiley has been carrying on an investigation for some months on these cola drinks. While he does not say anything about Coco Cola specifically, he speaks of drinks of the cola class. This is what he says:

"During the year the properties of the beverages of the 'cola type' have been ascertained by chemical research and their composition determined by careful chemical analysis. The results have been ~~vary~~ of very distinct value in a practical way. The influence of such a drug as caffeine often present in medicated beverages of this kind, varies greatly with different individuals, making it desirable that the public should know the character of the stimulant they are buying.

"It is generally believed that an alkaloid, like caffeine, when its natural form of combination is destroyed and it is administered in a pure state, is made much more active thereby, and this should be remembered when considering the amount of caffeine present in medicated beverages of this type as compared with that in coffee or tea.

"Moreover a person who drinks tea or coffee is aware of the fact that he has taken into his system alkaloidal material which when used in excess

may prove injurious, while the drinker of the cola beverages is wholly unaware of the nature of the drug consumed. Investigations have shown that the continued use of such beverages may be injurious and their indiscriminate use by those ignorant of their nature should be controlled. This is especially true in view of their excessive use by individuals and the rapid increase of beverages of this type varying in harmfulness.

"Approximately 80 samples of these products have been examined. The investigation was undertaken for the purpose of ascertaining the nature and character of the beverages sold principally at soda fountains, and special attention was given to the detection and estimation of caffeine, cocaine, and coloring matter. A complete analysis has been made in every case, not only to determine the composition of the product, but also to ascertain whether the ingredients claimed to be present were actually used in preparing the drinks. With few exceptions, all contain caffeine added as such. In fact, the caffeine is rarely introduced by using an extract of the plant or article containing the caffeine in natural combination. Cocaine was also found to be present in a large number, and many were artificially colored with coal-tar dyes and agents derived from vegetable and animal sources.

"The caffeine present in an ounce of medicated soft-drink syrups, the quantity usually entering into a glass of the drink, varied from a trace to 1.2 grains. A considerable number of the medicated soft drinks were free from cocaine; and when its presence was established the amount varied from a trace to 0.05 grain to the ounce, the average amount used in preparing a glass of the beverage. Fifty-four cups of tea and coffee, as served at representative hotels, cafes, and restaurants of Washington, were collected and analyzed for the purpose of ascertaining the quantity of caffeine present and comparing it with the amounts contained in the medicated soft drinks. The average amount

of caffeine per cup of coffee was 2.2 grains, varying from 1.55 grains to 3.74 grains. The average content of caffeine per cup of tea was 0.98 grain, varying from 0.31 grain to 2.15 grains. An interesting point brought out is that tea and coffee served at the better-class hotels as a rule contain a greater per cent of caffeine."

Caffeine, you know, is a drug obtained from coffee, and it is the active principle of coffee. Tea contains caffeine also. Two grains of caffeine is a dose, and in one cup of one of these drinks you are getting more than half a medicinal dose. In two cups, you get a full medicinal dose of caffeine. You noticed in what I read, that it is shown that the better the coffee or the tea, the worse it is, that is, the more caffeine it contains.

Now, I am going to talk to you tonight about some of the wonders of water. Two hundred years ago, an English clergyman ~~was~~ wrote a book entitled "The Curiosities of Common Water." I think it would be more appropriate if we should talk about the wonders of water, if you please, and not common water, but uncommon water. Water is one of the most remarkable of all the elements. The chemists today don't understand water. The last word about it is that there are really two or three different kinds of water; that water is not a simple thing as it seems to be, at all, but there are several different kinds of water. Water seems to assume different forms at different temperatures, but we haven't time to go into the physics of water nor the chemistry of it; but we are going to talk tonight about the medical properties of water, or the therapeutic properties of water, if you please; so I am going to have a few pictures on the screen here to focus your attention while we talk about it.

This doctor I was telling you about who wrote about the curiosities of common water 200 years ago, did not make very much impression. You can

find his book at the present time in some of the great libraries, but I think you will find it in very few medical libraries. The doctors repudiated the book, of course, because a clergyman wrote it. Doctors don't like to take cues about the treatment of the sick from clergymen any more than clergymen would like to take cues in theology from doctors. And yet, John Wesley wrote a book on "Primitive Physic" 200 years ago that had very great vogue indeed. The copy which I have in my library I think is the 17th edition of the book, and it is a wonderfully sensible little book, brimful of practical ideas. We find about fomentations in it, and water drinking, and wet sheet packs, and wet sheet rubs, shower baths, and a whole lot of things we are using here at the Sanitarium, ~~that~~ many of you ~~have perhaps~~ think perhaps are rather modern innovations,--you will find a considerable number of them used in John Wesley's time, and described in his book written 200 years ago. John Wesley, by the way, was a vegetarian along with the rest of things. If John Wesley was here I think he would belong to my church, or I would belong to his church; that is, if he were alive and he kept his church in line with what he taught, I think perhaps I might think it worth while to join it, though I don't belong to any church at all; or I might perhaps invite him to join my church.

Now, some of you, I think, will hardly be able to guess what that is. It is an illustration showing the effect of water. What you see there is the impression left behind by a fomentation. This is the skin of the trunk upon which fomentations have been applied for about three months--fomentations applied every day for three months produced that coloration, this mottled appearance which you see here, of the skin. How did they do it? By stimulating the cells of the skin, the pigment cells of the skin; by stimulating the circulation of the skin so that a large amount of blood was brought into it; and if the fomentation is applied to the skin of any person's body for two or three

months, it will produce just that effect. If we had a picture of this for every person, it would answer as a means of identification, because no two persons would produce exactly the same coloration here. You see, then that water in any form, heat in any form, hot or cold water applied to the skin makes an impression upon it through the seven different sets of nerves with which the skin is supplied. There are seven distinct sets of nerves in the skin, and these are all influenced by water.

Here we have some little surfaces marked out, you see. These are to show the relation of different parts of the skin surface to internal parts. Now you have had like experiences. I am sure all of you have had this very common experience. Sometimes you have felt a little tired, or weary, or depressed, and you bathed your face with cold water, or your hands with cold water, and how much better you felt. I notice a lady over here is using a fan now because it is a little warm. Why does she use it? Because the fan moves the air a little more rapidly against the face, which promotes the evaporation of moisture upon the face, and that cools the face a little. That is the reason why movement of the air is refreshing, why the electric fan, or the fan we use by hand is refreshing when applied to the face here,--because the skin of the face is connected with the brain. The skin of the face is connected with the brain; nerves go from the face to the brain. This connection by nerves between the face and the brain is exceedingly intimate. We are scarcely aware how close this really is. Did you ever stop to think how the face changes with the varying emotions of the brain and the mind? You can tell very often by looking at a person's face what he is thinking about. If you meet a person and you don't make a good impression upon him, you know right away,--something tells you, you have seen the expression of the face, and some

folks are very acute in reading the face. Perhaps very often a baby not more than six months old gets an impression from the face, because the face is somehow a mirror of the mind. The brain is connected with the face by a great number of strings,--little nerve filaments connect the nerves of the face and the muscles of the face with the brain. Many of them are attached by one end to the bones, and by the other end to the skin; and some are attached to different parts of the skin; and these little muscles are all the time dragging and pulling the skin around into different shapes in harmony with the changing and varying emotions of the mind. When the mind changes, the face changes. For instance, when a person has a scornful feeling, is in a scornful, disdainful state of mind, you know it right away. There is a sort of pulling up of the nose, an elevation of the nose; we say the person turns up his nose. That is exactly what he really does. There are little muscles here attached to the nose, the ~~levator~~ levator labii superioris alaeque nasi muscles--please don't repeat that to anybody. They are attached to the edge of the nose, and when this muscle is contracted, it pulls up the edge of the nose. Here is another little muscle attached to the corners of the mouth, and when these muscles at the corners of the mouth--some pull them up, and some pull them down,--when the muscles pull them down we are unhappy, miserable; and when the other muscles work and pull the outer corners of the mouth up, we are happy; we say a person smiles, or is grinning from ear to ear, because these muscles attached to the outer corners of the mouth are working hard, and stretching the mouth out as wide as possible. So you see the only difference between being happy and unhappy, is turning the corners of the mouth up or down. Contract these levator anguli oris muscles, and your state of mind will change at once. I only mention this incidentally to place before you this one thought--that very much all we have to do in the world is to keep our faces straight. If we just keep

our faces straight, everything will be all right with us; because we can not keep our faces entirely straight without keeping straight inside.

Now this relation of the face, then, with the brain, is very minute, you see, very intimate. The muscles and nerves of the face are associated with the brain in such a way that all these changing mental emotions are mirrored in the face. We can utilize that fact, and do utilize it. That is why so many of these ladies are fanning themselves, you see, why so many are fanning themselves in a church often, when the air is a little warm, because ~~xxxxxx~~ by hastening the evaporation from the skin, they are able to make themselves more comfortable, feel far more quiet and comfortable, and their hair passes along more agreeably when the face is cooled in this way. It is because of the influence of sensations upon the face upon the brain. Now the brain has a face, then, here, for the countenance is the face of the brain; but it is larger than the face. Perhaps the ladies do not know that these little spaces around the eyes and the eye lids, are worth more than all the rest of the face, in their influence upon the brain; and the spaces around the ears are worth a great deal more than the rest of the face outside of the eyes; and the neck is of just as much importance as the face. The neck and the face, the eyes, and the ears have a very similar relation to the brain. When you feel depressed, feel sleepy, or you feel tired, and you apply cold water to your face, immediately the brain is relieved of its weariness, because the brain is stimulated. When you stimulate these nerve endings of the face, the stimulation travels back to the brain; and the brain is immediately lifted a little, elevated, stimulated, able to put out more energy; the nerve tone is raised by the application of cold to the face.

Now, the important thing I want to call your attention to is the fact

that every organ of the body has its face. It is not simply the brain that has a face, but every organ of the body has a face. The heart has its face in the skin of the chest which lies over the heart. The lungs have a face. The whole of the skin covering the chest and back both are the face of the lungs. I will illustrate this to you by a very common experience, which you are all familiar with. Perhaps somebody dropped a little bit of ice down the back of your neck, ~~perhaps~~ sometime when you were not thinking, and immediately you took a deep breath and perhaps did something else too. I don't know just what you did do,--you can explain that better perhaps; or the other person can tell better about that, perhaps; but a little ice or cold water dropped down the back of your neck, coming in contact with the skin, just instantly caused a strong inspiratory movement. That is what happens when you take a shower bath and the cold water first strikes you. When the boys go in swimming in the spring, just the minute the feet come in contact with the cold water,--some of the gentlemen here remember just how that was. Why is that? It is because the effect of cold water upon any part of the skin is to stimulate the respiratory nerves. That is the function of the lungs. Just so, when you put cold over the heart, it makes the heart bound, contract with greater vigor. Here is a person who has faded away, lying down here in a state of insensibility, the face pale as death, just a little bit of flickering pulse, and you say he is ~~xxxx~~ nearly dead. If he is not quite dead, he would be pretty soon if there wasn't something done. Now what would you do? Everybody knows that cold water is the thing. Dash some cold water in his face, percuss him in the face, slap ~~his~~ face, or slap him over the heart is a great deal better. If it is a lady that has fainted away, you know what happens then. If a lady has fainted away in church, you will hear somebody whispering, "Cut her corset strings." Now if it is a man who has fainted away, you don't hear somebody say, "Rip up the back

of his vest, quick." Everybody knows what is the matter with that woman; she has no room to breathe. When a woman faints away, everybody knows the average woman dressed up to go to church simply to hear the preacher is not going there to breathe.

Now, here is the face of the stomach, you see; here is the face of the spleen; here is the face of the left kidney, here of the right kidney, and of the liver; here of the intestine; and here is the bladder face; here are faces in the hands. The inner surfaces of the hands and the soles of the feet have very extensive and remarkable relations. They are related to the bladder; they are related to the bowels; they are related to the stomach, to the brain, to the lungs--these faces of the hands have an important relation to the lungs. I shall never forget a very tragic scene in which I had to act a part some years ago. I was called to see a lady who had hemorrhage of the lungs. Everything almost had been done. I said what have you done. Have you used salt? "Yes, I have taken salt!" "Have you inhaled turpentine?" "Yes, I have inhaled turpentine." "Have you applied ice to the chest?" "Yes, I have applied ~~xx~~ ice to the chest." Yet she was just spitting out blood, quantities of it, and I knew she could not live but a few minutes, from the way she was losing blood from this terrible hemorrhage; and it was a most appalling sight--coughing out quantities of blood. I immediately seized a block of ice--practically everything had been done, and I knew of only just one more thing to do for her, as the other things had been all done,--I seized a block of ice and put a block of ice in each hand, and shut the hands up over those blocks of ice. That bleeding ceased in ten seconds; it ceased right away. It was almost a magical thing to see that hemorrhage stop; and that woman

who looked up to me with a look of despair on her face, like a person just going down the last time beneath the water, was the happiest woman I had ever seen in my life, and I was happy too, because this ice, this principle I am explaining to you, had saved that woman's life. I just recall a circumstance I must tell you about. Some ten years ago I was giving an address at a large gathering somewhere in the west, I think it was Portland, a lot of people gathered together there, I think perhaps 1200 or 1500 people, and I was talking to them about these same things I am telling you about, and I said, "Now, I wonder if there is somebody here who can testify to the value of water, of simple water, in saving life,--that has had some experience." A man got up, and he said, "Doctor, I can tell you of a case," and he immediately began telling about it, and it was such an interesting story I am sure you would like to hear it. He said, "Doctor, we have just one child, and when that little boy was about two years old, he was taken sick, and we thought certainly he would die. He was very sick; he kept getting worse and worse and worse, and we were ten miles away from a doctor, and finally my wife said, 'John, go for the Doctor.' She said 'We have done all we can; just go for the doctor.' When I got there, the doctor said, 'It is no use to go; that child will be dead by midnight. It is no use for me to go, because the child will certainly die.'" "So," he said, "I went home with a very heavy heart, and I got home about ten o'clock, and the child was getting worse, and kept getting worse, and worse and worse and worse, and by and by midnight came, and the little one just about midnight, within a few minutes of midnight the little one breathed its last; its breath seemed to be gone, and my wife says, 'O John, O John, he is dead, he is dead.'" And I said, 'Let us try one thing more,' so I seized him, and I held him up, and I said, to my wife, 'Throw some water on him,' and she just emptied

the water pail on that little boy as I held him up there, and you know as that water struck him, he just took a deep breath like that (Illustrating), and he has been breathing ever since." (Applause). "Now," I said to him, "What made you do that? What made you do that? That was a strange thing to do to a baby." He said, "I don't know"; he said, "it just came to me just that minute to do it." You see it was an instinct that told him that; it was the same instinct that told that little monkey I was telling you about some time ago to climb up a hot water pipe and take a fomentation when it had been swallowing some green fruit. It was the very same thing. The monkey did it. I saw it with my own eyes.

I was out some little time ago in the country, and I found a horse that had backed up against a scythe and had cut~~x~~ its foot half off, had hurt it very badly, and one of the ladies who saw it fainted away, and other people said it was a hopeless case, that the horse was a cripple; ~~and~~ the accident happened two weeks ago, and I saw that horse the other day capering about the pasture, and the only thing in the world that had been done for it was to have a wet rag kept around his ankle all the time. A sensible man came along, saw the horse, put a wet rag on it, had a boy change it regularly three or four times a day and keep it wet all the while, and that horse is capering around the pasture as lively as any other horse there. It did not cut the tendon entirely off, but cut it about half off. The skin still lacks a little bit of healing, but it is getting well.

There is an instinct that tells us how to use these forces of Nature. We call it instinct. Suppose a boy has got stomachache--he always curls up, gets his knees as close to his chin as he can. The little fellow curls up in bed,

and gets his knees and his chin as close together as he can. That is exactly what the dog does when he has stomachache. When the dog gets earache, he puts a paw up to his ear. The baby does the same thing. That is the way the mother knows when the baby has got earache when it is not old enough to talk. That is the sign of ear trouble with the baby, as I suppose every mother knows. Every organ of the body, with a single exception, has a spot upon the surface of the body at which it can express itself and through which it may be reached. Now just think of that. We can reach the brain; we can touch the brain through the face; we can touch the heart through this heart surface. The precordial region, the chest, and all these other areas are areas by which we can reach the different organs of the body.

Now, we will look at the other side. Here is the back side of the body. Here we have the very same thing again in the other way. Here are the spinal centers. One has charge of the lungs, another of the stomach, another of the bowels, another has charge of the pelvic organs, of the bladder, and another of the brain. When these surfaces are treated, we are treating those very organs without touching them through the nerve fingers which reach out into the skin--we can make a most forcible appeal to them. Now, for instance, the heart is going too slow,--we can stir it up in this way; we can awaken the heart to greater activity. Some thirty years ago I was called out of the city to see a man who had taken an over-dose of opium, and his heart was beating sixteen times a minute. His respiration had gotten down to four a minute, and he was almost dead. He had been given up. I was asked to take down a battery. I knew it would not do any good; but I took some wet cloths, threw them on top of a stove to get them hot right away quick, and I put them on so hot that we found after while the skin was coming off a little bit in two or three spots. I put that fomentation on for fifteen or twenty seconds, then rubbed on a piece

of ice, then fomentations again, and had three or four people running back and forth to the kitchen stove bringing those hot flannels. Now, then, it was not five minutes before that man aroused so he was rolling around in bed and talking. It was a most amazing thing to everybody there. They had all given him up for dead, and it was almost like a resurrection to see that man talking in five or ten minutes; and there was such excitement as I never saw before in my life among the friends who had all given him up for dead. I have seen many a resurrection of that sort, or a transformation which was almost a resurrection.

There is no agent I know of that has such power as water. Now let us talk a little more about the principles by which water operates. This represents, if you please, a congested skin. When we apply cold to the skin, it causes contraction of the blood-vessels of the skin, and not only contraction of the blood-vessels of the part to which the cold is applied of the skin, but of the internal organ which is related with that portion of the skin. For instance, if cold is applied to the face, it makes the skin of the face pale, and it makes the brain pale also. That is the beautiful thing about it,--that the organ which is related to that portion of the skin,--the organ of which that part of the skin is the face,--the blood-vessels of that organ contract the same as those of the skin.

Here is an illustration of a boil. You see what great congestion there is there. It is very red where the boil is. Suppose you put on a fomentation on the skin outside of the boil, the boil becomes paler also, because the blood which comes up to that region is distributed through a larger area, you see; and there is less blood, now, in the boil and more outside of it. If you want to get the best effects, you put a piece of oiled paper or a little piece of rubber cloth over the boil; then the heat will be applied to the part

outside of the boil, and by distributing the blood around outside of the boil, the boil will be relieved.

That is the way pain is relieved in part, but heat and cold have very different effects. Heat has the effect to kill pain, while cold has the effect, generally, to increase pain. Now, this is supposed to represent the skin of the surface and the muscles lying under the skin; and here is a large blood-vessel which comes down here and sends one branch up to the skin, and sends another branch down to the muscles beneath the skin. This shows a normal state of things. When you apply a fomentation to the skin, that draws the blood, which has been going down to the muscle ~~thru~~ through this branch, and throws off a large part of the blood to the skin. It diverts the blood, and produces what is called collateral hyperemia. On the other hand, if we put cold on the skin, it contracts the skin, and drives the blood down into the muscle. So more blood comes to the muscles than to the skin. That is collateral anemia. When we apply cold to the surface of the skin, there is instantaneous contraction of the blood-vessels of the skin and of the muscles, and of all the internal organs. These blood-vessels contract at the same instant; and by this means there is a sudden start through every organ, an impulse given to every organ and function of the entire body, when cold is applied to the entire surface. This is the reason cold becomes the most powerful of all tonics--because it is the most powerful of all alteratives. Think of every single drug, and every single medicine you can take, and you can not think of one that will do such a thing as that--~~ixix~~ contract instantly every blood-vessel of the body and drive it all into the veins. Then a moment after, the blood-vessels dilate, ~~razaxax~~ reaction takes place, and when reaction takes place, there is such a splendid feeling of well being. When you take that cold morning douche, especially the plunge into water, you come out with a fine glow and feelings of exhilaration.

Why is it? It is because of this new impulse that has been given to every single drop of blood in the body; it has been sent forward with greater vigor. It is exactly like turning a whole lot more water over the water wheel, and it turns with greater velocity.

Here are a few of the ways in which it acts upon the skin. Here is the thermophore blanket which has German silver wire woven in along with the wool of the blanket, so that every once in so often the wire goes in, and it runs all through it; so the electric current is transmitted through this little wire into that blanket and it runs everywhere all through the blanket, and the wire is heated, and in that way the blanket is heated. We used to heat the skin by wringing the blanket out of hot water, and it can be done that way. You can do that at home; but this is a simple and convenient way of doing it more scientifically. When you wring a blanket out of hot water and apply it to a patient, it begins to get cold right away, and it keeps getting colder, and colder, and colder, and colder all the while, so you have to have it at the start so hot you can not stand it; it will almost burn, cook you at the beginning; but pretty soon the heat works off and it gets cool. But in the electric blanket, the heat starts rather low, and your tolerance is increased as the heat is applied, and it keeps getting hotter and hotter as you want it, and you can turn it off and keep the heat just where you want it and as long as you need it. We find this of very great service in the surgical ward. By means of the thermophore blanket, and by other means, we are able to dispense with the use of opium and other narcotics, almost entirely, in our ward. We hardly ever have to use them.

This patient is having a fomentation applied to the spine. This is supposed to be a patient suffering from visceral neuralgia. Somehow, by the

application of heat to the spine, the ~~influx~~ impulse is sent to every part of the body where these spinal nerves run to. Every part of the body that receives a nerve from the spine is influenced by this fomentation. There is nothing that produces such a general effect on the whole body as a fomentation to the spine. The spine is a sort of piano forte on which the hydriatic musician can play, because every part of the body is represented in the spinal cord. From the spine branches run into the arms, the face, the neck, further down into the chest and abdomen, the internal organs, the gastric organs, and down the legs; so every organ of the body receives nerves from the spine. Every one of these nerves that starts out from the spine sends a little branch back to the skin of the back, a little branch turns back, so the skin of the back has nerves which are connected with every nerve in the body, and every organ of the body. That makes the back, as I said, a sort of keyboard on which the physician can play and produce any effect desired. If you want to stimulate the action of the heart and lungs, apply hot and cold applications to the upper part of the spine. If we want to stimulate the stomach, we apply hot and cold to the middle of the spine; and if we want to stimulate the bowels or other pelvic organs, we apply hot and cold to the lower part of the spine; so we can make the application anywhere we want to. Suppose it is pain in some of these internal parts, then we apply the fomentation along the back.

The osteopath profits by this wonderful mechanism without being himself aware of ~~xxx~~ the reason for it. The osteopath rubs the back and the patient feels better, and the osteopath supposes it is because he has been putting some vertebra into place; that he has been doing something to the spinal column, the vertebra, and that is his explanation. His explanation is altogether wrong, because the vertebra is intended to get out of place. Here is a vertebra that

twists and wobbles about in every sort of way naturally. To say that a vertebra is an eighth or a quarter or an inch out of place is ridiculous, because they get a half inch out of place every ~~day~~ time the person bends over. They are continually being put out of place. So when the osteopath finds somebody who has got a pain in his chest, he says, "Well, there must be some displacement of vertebrae into the spinal column;" and he examines ~~ax~~ it, and he says, "Yes, it is here; here is a vertebra that is a quarter of an inch out of place"; and he pushes, and rubs, and in so doing manipulates the nerves of the back and so affords relief. The fomentation does the same thing by influence of the posterior spinal nerves. The fomentation is a wonderful means of destroying pain. Heat kills pain. Whether it is the fomentation, hot water, the photophore, the thermophore blanket pack, the electric light bath, the arc light bath,--no matter how the heat is communicated--a hot bath, a sand bag, a mustard poultice, or a bread and milk poultice,--no~~x~~ matter what it is, it relieves pain, because heat kills pain. Cold, on the other hand, excites the nerves; while heat is a sedative to the nerves, cold is an excitant.

Here is one of the most old fashioned of all the means of producing tonic effects--a sheet wrung out of cold water, wrapped about the body, then rubbing applied on the outside of it. This was invented by Priessnitz, one of the first water cure doctors, and this shows the effect upon the skin after this rubbing has been done for a little while; you see the contrast between the skin of the two persons here,--the skin becomes red because of the dilatation of the surface vessels.

Now, the man who has a congested brain or spinal cord, with a congested liver, who gets his skin reddened in this way--here are other means of doing it, by means of the cold mitten friction, or the salt glow. It is the same thing.

Here is another means of doing it, by means of the cold spray applied to the surface of the body, producing a stronger reaction. Remember that the skin is capable of holding two thirds of all the blood in the body; and when the blood is brought to the skin in this way, the internal parts are relieved of their surplus blood. You can not have the blood in two places at the same time. We have got only about so much blood, ~~say eight or ten~~ ten or fifteen pints of blood according to the size of the person; and if half of this blood or two thirds of it is in the skin, there is less inside. It is most all inside when the skin is pale, and we see so many chronic invalids with the skin generally pale in those cases, so the internal parts must be congested.

This shows a congested kidney; and here is a kidney that has been relieved of congestion by the ice bag in front, and the heating compress behind--that is a cloth wrung out of cold water quite dry, applied to the skin, a mackintosh over it, and allowed to get warm, to warm up; and that diverts the blood into the vessels of the skin and produces venous congestion there. It draws the blood away from the skin. Cold in the back by means of the ice-bag there causes tonic spasm of the vessels of the kidney, and so relieves the arterial congestion; and by putting the two together, a remarkable effect is produced upon the kidney.

Here is a congested stomach. We apply an ice bag here over this little nerve I was telling you about, and that causes contraction of the vessels of the stomach and so relieves that congestion. This is accomplished through the nerve centers of the spine, because the nerve that comes here to the outside of the skin,--a branch of that same nerve goes to the stomach within. Thus these external applications effect changes in the conditions of the internal parts.

This shows another remarkable thing,--the hot and cold trunk pack,-- the hot and heating trunk pack. A towel is wrung out of cold water, wrapped clear around the body, and a fomentation or hot bag is put on the front or over the stomach. This will relieve vomiting when nothing else will. This simple method will relieve vomiting when no drug, no medicine, and no other means known to man will stop the vomiting. This is the method that succeeds in almost every case. I am sure that this simple thing--a towel wrung out of cold water quite dry, wrapped about the body, and a fomentation or hot bag put over it in front, as you see here, has helped me out of trouble more than any other one thing I know of. I don't know of anything that has helped me out of really serious trouble ~~more~~ with patients as that has, and it has helped other people out of trouble too; but when a doctor is brought face to face with a person who is suffering from some acute symptom and needs to get relief, he is in serious trouble, and the doctor is in trouble too, because he may lose prestige if he is not able to relieve his suffering patient; and that is the greatest distress any doctor can suffer.

Here is another simple thing--the hot foot bath. How often that relieves pain. I remember once when I was a small boy, I had a terrible tooth-ache. My mother taught me about the use of hot and cold when I was a boy. I got more good instruction about how to cure sick people from my mother than I got from my medical college study. I don't know that I have ever said that in public before, but, as a matter of fact, my mother gave me a right start in how to treat the sick. She was the family doctor, and practiced on me when I was a boy, I remember, with wet sheet packs, and all sorts of hygienic methods, that were very crudely understood in those days; but my mother had a rare fund of good sense; although she did not understand the scientific part of it, she somehow had an intuition that told her what to do, and she used to help out the

whole neighborhood; so I knew a little something about the use of water when I was a boy; and when I was about twelve years old, I had a terrible toothache, one night. I woke up about three o'clock in the morning, and it seemed as though my tooth was trying to jump out of my mouth. The pain came in great surges, was simply terrific, and I seized my face and ran downstairs, found some hot water in a reservoir behind the kitchen stove, got a pailful of water as quick as I could, and got my feet into it, and it was not fifteen seconds before that pain was gone. Now, how did that hot water to my feet relieve the pain in my tooth? It was simply by diverting the blood into that part. There was too much blood in the nerve of the tooth. And when my feet were in the hot water and the veins began to swell out, and the blood ran down into that region, the congestion was relieved; and, as I have said, there is a magic power in heat to relieve pain. Heat kills pain. Don't forget it. There are twenty-five different ways in which pain can be relieved without the use of drugs. I am going to make that the subject of a lecture one of these days, and tell you about it.

Here is a sitzbath. This is a very much more luxurious method of taking this bath than the old Priessnitz method, which was sitting down in a wooden tub with water at about 60° and staying there two or three hours. The foot bath draws a large amount of blood away from the head.

Here is treatment for cases that do not yield to the foot bath. If there is a terrible pain in the head that is not relieved by the foot bath, the footbath and sitzbath together may sometimes relieve it. A gentleman told me how he was attacked with grip on the Russian frontier. And he told me what he did. He just took a hot sitzbath such as we have just shown you here; then he put a pack upon his chest, a cold compress,--simply a towel wrung out of cold water wrapped around his chest, covered with flannels, and he went to

bed, and when he woke up in the morning he was all right. Here is a congested lung, and there is a lung relieved by this cold compress. There isn't any means so good as this heating compress for relieving an internal congestion. You have all tried it, perhaps, with a piece of pork with a little paper on it, put around your throat. That piece of pork does not do any more good than the heating compress--a little piece of cloth wrung out of water, and put around your throat; and perhaps you have heard of the wonderful relief the skin of a black cat gives in pneumonia. I heard a doctor once tell a story of his first experience when he went out to practice. He had great terror of his first consultation; and he knew when he had that consultation, he would be shown up as a terrible ~~ignoramus~~ ignoramus. And he finally got a case of pneumonia. The patient was not doing very well, and the friends finally suggested they would be glad to have a consultation, and they suggested good old Dr. Jones should come in and advise what better be done. The young man was in perfect terror. He knew that when Dr. Jones came in he would discover a whole lot of things he had not done, and he had perhaps made a mistake in diagnosis, and he was in very much terror about it. The old doctor came, looked very wise, looked at the patient's tongue, etc; said, "This is a very serious case; I am rather doubtful if this patient will recover, but still, I think there is a chance if we can obtain for this patient the skin of a black cat and apply it to the chest, I have some hopes that the patient may recover; but be sure the cat is thoroughly black, and that there are no white spots on it." They got the black skin of a cat, put it on the patient, and the patient began to get well. However, the skin of the black cat might have done good if they had got it quick enough, because it would have been a heating compress simply, nothing more, and that applied to the skin would have retained the heat in the skin. What does that do? We will see later.

Here is the wet girdle applied about the body. Everybody who has trouble with the bowels, better wear the wet girdle at night. It comes the nearest to being a universal remedy of anything I know of. It is good for hyper, and good for hypo. It works equally well for both, because it stimulates the circulation normally of the blood, and increases the movement of blood through the stomach and intestines, and in that way accelerates the healing process. It is the blood that heals, and the heating compress applied to the body accelerates this movement of the blood through the body and so accelerates the healing process. Here is the mitten friction, and here is the roller chest pack.

Now we come to the heart. When cold is applied over the heart, it causes the heart to contract; it sends the blood out through these large tubes here with greater force, and so stimulates the whole circulation. I might tell you some interesting stories of what cold has done in saving lives, but we will ~~skip that~~ save that for another time. Here is another wonderful thing which cold does, which is perhaps the most wonderful of all things that water does. Here are some pictures of the blood-cells, different kinds of blood-cells. Some of these blood-cells capture germs; some of them are scavengers, gather up the debris in the body, and eat up the things that are not needed. Others fight the bacteria of various sorts. Some of these enormous, big ones are scavengers. Here are some others of these cells. We will just pass on quickly without stopping to ~~talk~~ talk about these different kinds of cells. This picture I want you to see again in this connection. These represent the blood-vessels, and these are red cells passing through the center; ~~and here are the white cells~~ and here are the white cells. You see the red

cells going along like a procession of men carrying brick and mortar to the construction of a building. These white cells are always loitering along the walls. They just go loitering along, hitching along, just as though they were loafing there, ~~loaking~~ but they are not loafing; they are looking for germs. These germs are likely to be found along the walls; or for debris,--something that is not needed there; licking up everything along the wall; and they are scavengers. They are clearing the king's highway, if you please, to keep everything clean and sweet in the blood-vessels. Now when these white cells come along to a spot opposite where there are some germs, these little specks here represent germs,--typhoid fever germs, if you please, that have gotten inside, or tubercle germs,--germs which produce consumption have gotten into the tissues. Just as soon as they get opposite the place where these germs are, they immediately begin to escape, and they accumulate, and pile up in great numbers; they begin to huddle up in great numbers, and then they bore holes through the walls, creep out just as you can tuck a pocket handkerchief through a ring; then they pursue these germs. They don't go running all about like a dog trying to catch a rat, but they go right straight to the germ. They go right to the germs at once and swallow them and digest them; and pretty soon the germs have disappeared, because these white cells have gathered them up and eaten them up, and destroyed them completely, killed them; so the disease is cured. The application of water is the most effective means known to man for increasing the activity of these cells. This process is called phagocytosis. Their accumulation in the blood is leucocytosis, and their going out of the blood-vessels is migration, and the capturing of these germs here is phagocytosis. They are known as microphags; they capture the germs and destroy them. By means of a short hot bath, or a short hot application followed by a short cold

application, the number of these white cells in the blood can be increased 30%, or even more than that--even 50%, in thirty minutes. Now think of that, my friends,--to increase these white cells in the blood as much as 30 or 30 or 50 per cent in thirty minutes' time. That thing has been verified by many experiments. Winternitz was one of the first to demonstrate this, Winternitz of Vienna, and since that time, it has been taken up by bacteriologists in this country, by the medical experts of Johns Hopkins University, and in Boston, and other experts in various parts of the country, and in our own laboratory. When it first came out we demonstrated it again and again by experiments, and we found it of very great value as giving a scientific foundation for the hy-driatic treatment of fevers, of infectious diseases. We see now, why it is that the cold bath cures the fever,--provided it is given right.

When I was a medical student, I listened to a lecture in one of the hospitals in New York by a great clinical teacher, the late Prof. Loomis,--one of the ablest physicians in the country, who had not studied the cold bath yet. It was just coming into this country. Dr. Loomis said, "We had a patient suffering from pneumonia in the hospital, and we put him in a cold bath, and kept him there for an hour, and he shivered and shivered perfectly dreadfully; and we took him out, and in half an hour he died; and I am never going to use the cold bath again. I believe that cold bath killed him"; and it did; there is no doubt it killed him. But that is not the way to give the cold bath. You don't want the patient to shiver, and when you put him into a cold bath, he must be rubbed and rubbed and rubbed, every minute while he is there, so that the skin will be kept warm, and he is kept from shivering. Then, when that is done, these phagocytes, the cells that fight the germs, are enormously increased, by improved circulation of the blood, by bringing the blood to the surface.

There is a picture of the man Priessnitz, that simple peasant boy grown

This is a picture of the man Priessnitz, that simple peasant boy grown to manhood, away out in the hills of Graafenburg, in Austrian Silesia, away out on the frontier of Russia, 100 years ago was using water with as great success as the wisest physicians in the world today, yet he could not read or write. He could not write his name until he was forty years of age, but he was given by the Austrian government a special diploma authorizing him to practice the use of water, because he cured people with water that the whole medical profession gave up as absolutely hopeless; and people who traveled to him from all over the world were cured. There was an impulse given to the use of water by this man, who was a genius divinely inspired, and the impetus given to the use of this remedy has extended all over the world until, at the present time, there is not an advanced or up-to-date physician that does not know there is no remedy so valuable in the treatment of fever as water.

One of our doctors told me today that he was called out in the city to see a sick child with a temperature of 106° ; and in just 45 minutes from the time he arrived, that little one's temperature was down to 102° . Three hours afterwards it had risen to $104\frac{1}{2}^{\circ}$, and in a few hours it was down again, and the little one today was well. It would have been dead, doubtless, in a few hours if the hydriatic applications had not been used. A doctor was called from here over to a neighboring town a while ago to see a patient. A doctor there had a patient whose temperature he could not reduce; the temperature of the patient, a child, had been 105° for three days, and the child was likely to die pretty soon. The doctor went over from here, and in three hours' time the temperature was down to 101° instead of 105° , and it did not rise any more; it was kept down. The home doctor was doing something, but did not do it exactly right.

If we could have these rational measures employed in the treatment of fever, typhoid fever, for example, instead of losing 91,000 people every year with typhoid fever, as are now being lost in this country--91,000 citizens wiped out by this one disease, we would only lose 9,000. At least nine tenths of them all could be saved just as well as not by the application of this simple remedy, water.

This is Prof. Winternitz, the pupil of Priessnitz, and at Vienna, or at Kaltenleutgeben, he has an institution there, and he is one of my dearest friends, and I often hear from him, and I always call upon ~~xxx~~ him when I go to Europe, and we exchange ideas, and he has introduced the electric light bath, our Sanitarium electric light bath; and when I visited his institution last, a few years ago, I asked him if there was anything new, and he said, "Come here", and he introduced me to ~~one~~ of our electric light baths, and introduced me to a head sticking out of the top of the bath. This was Prince Hohenlohe, first lord of the treasury of the German Empire, and he was a patient with him at that time. This is Mrs. Winternitz, one of the most charming and accomplished women I ever met. She speaks three or four languages fluently, as does also her husband. He has made these principles acceptable to scientific men of Germany to such a degree that he is now professor in the great Imperial Medical University of Vienna.

Here are some of our Battle Creek Sanitarium scientists. I thought you would like to take a look at them. They don't look as though they needed beefsteak, do they. There is not one of them that eats beefsteak, touches it. Some of them, at any rate, I know whose lives have been saved by adopting the Battle Creek Sanitarium principles in diet. As you are stopping here at the Sanitarium, some of you, I suppose, have doubts arising in your mind whe-

ther you can live on this diet. While you are here I want you to take a look at the doctors and nurses and the people you see about here and see how they work, what they are doing, and make up your minds whether you have to work any harder than some of the people you see around here, when you go home. Here you see people who have been going on for five or ten or fifteen or twenty or twenty-five years, or thirty, thirty-five or forty years without the use of meat, ~~xxx~~ and are still alive and able to do business. It is forty-three years since I gave up the use of meat, and I haven't eaten a pound of meat in all that time, and I am only sorry I ever ate any at all, because I feel sort of polluted, and wish I had some way of getting rid of that reminiscence.

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Aug 19 - Dec 10, 22

The Liver.

Aug. 19, 1909

- Liver, the p-2
- Fasting, (illus.) 2-3-4
- Liver, gin, from use of pepper
(illus.) 6-7
- Meat, decayed 11
- Colon putrefaction, pre-
vention of (illus.) 16
- Bacteria in cooked meat 17
- Cecum^(?), enlarged. 17-18
(“cushion sensation”)

27

"Dead drunk with food," 18, 19

Sunshine, benefits of 20

See for 22

THE LIVER.

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday,

August 19, 1909, at 8:00 P. M.

by

J. H. Kellogg, M. D.

Also short talks

by

Mr. Goodwin Brown, and

Mr. S. S. McClure.



We are to have a little symposium this evening. First I am going to talk to you a little while about the liver; then you are going to hear from Mr. ~~Goodwin~~ S. S. McClure, of McClure's Magazine; also Mr. Goodwin Brown, a very eminent lawyer of New York, who will have some interesting experiences they will tell you about ; so I will hurry up so as to give them more time to talk, for I am sure you will be glad to hear from them.

The greatest enemy of health, in fact the greatest enemy of religion, the greatest enemy of all good things is ignorance, and we are improving these opportunities that we have on Monday night and Thursday night,--I am endeavoring to improve these opportunities the best I can to give you information about the things that have been found out in relation to the causes of disease.

We are all surrounded every moment of our lives with pitfalls of disease that have death at the bottom; and we are likely to step into them, and if we do not know where they are, we are very likely to find ourselves in a pit-

fall, in a bottomless pit, or away down deep somewhere in a pit of disease and need somebody to help us out. It is better to keep out. (Now the liver is the largest gland in the body. It weighs three and a half pounds. It secretes bile, which is the most poisonous excretion of the body. The bile is twice as ~~taxis~~ toxic as the urinary secretion,--twice as toxic. This is poured out in considerable quantity into the alimentary canal, and it needs to be discharged regularly from the body just as other excretions need to be discharged.)

People sometimes try a fast for a week or two, or three or four weeks, and find themselves getting worse and worse all the while. I met a gentleman out on the lawn last summer who ~~ix~~ was taking a voluntary fast.) He asked me for permission to fast, and I said, "What for?" "Oh," he said, "you know I think I have been storing up impurities in my body for years; I have not been living right, and I think I ought to fast." Well, I dare say he deserved a good fast because he had eaten three or four times as much as he ought to have eaten, and it was a proper thing for him to do penance in some way to impress upon his mind the importance of doing right hereafter; but so far as the necessity for fasting was concerned, I told him it was not necessary; it was only necessary to cut down his rations, particularly the protein ration, and chew his food well--that is all that was necessary. But finally he went on a voluntary fast, was used to doing as he pleased. He had charge of a big department store somewhere and had a lot of people to boss, and he didn't propose to be ordered around entirely. He wanted to fast, and he fasted. We didn't know he was fasting, for he did not tell me about it. (I met him on the lawn one day and learned from him that he was fasting, and he said, "Doctor, look at my tongue, now just look at it, Doctor: I have been fasting here twenty-one days, and it is worse than it was when I began." And it was very bad; it looked as though it needed the city scavenger after it;

and his breath was very bad too. I said, "What are you eating?" He said, "Why, I have been fasting, fasting,--I have not been eating anything at all, haven't been doing anything but fasting." I said, "Well, I suppose the bowels move regularly every day?" "Oh, no, the bowels haven't moved at all; why should they move? I haven't eaten anything for three weeks. And I took a dose of salts before I began, so of course there is no reason why the bowels should move, because I have not ~~done anything~~ eaten anything." I said, "How about your liver? Has your liver been doing anything all this time? How about your alimentary canal? There are seven square feet of secreting surface pouring out poisons all the while, mucous secretions; there are little glands all the way along the intestine that are all at work, and the liver pouring out some considerable quantities of bile, a pint or two every twenty-four hours; there must be something in the alimentary canal." "I don't believe there is a thing, Doctor,--I don't believe there is a thing." I said, "Well, I will tell you what you had better do; you ~~have~~ better have a good big laxative dose." I met him three days afterwards, and he said, "Doctor, I feel like another man. Look at my tongue; it is cleaning off, and, Doctor, I want to tell you,--it is simply astonishing, simply astonishing the amount that has passed out of my bowels in the last three days; why, it was simply enormous; it was not less than a pailful of the most loathsome, horrible material you ever could imagine." I don't think it was a pailful, but I talked with his doctor about it, and he said it was a prodigious quantity. These are very plain physiologic questions I am talking about, of course, but you are here to learn good, practical things, and the only way is to talk about it. This man had supposed that because he had eaten nothing there was nothing to be discharged~~x~~ from his bowels. He had forgotten all about his liver. The liver is an excretory organ just like the skin, and the kidneys, and the excretion of the liver should be discharged; not only every

day, but several times a day, so that they won't be absorbed back into the body. The discharge of these poisons once in twenty-four hours is not enough, and the idea of storing up these poisons for forty-eight hours, or for a week, or two weeks, or three or four weeks, simply because you are not eating, is the greatest mistake in the world. Why, the bulk of your discharges is half of it made up of poisons; of course, it is only about half of it made up of food residues. At least half of it is composed of excretory substances that have been poured out from the mucous membrane and the liver, and needs to be gotten rid of as quickly as possible.) The twenty-five feet of small intestine, the bile being let in at the upper end of it, coiled up, looped up,--it is not taken up until we come to the large intestine,--here is where the small intestine is cut off; there is the opening; here is the ileocecal valve, here is the appendix, here is the colon, which is about five feet long. Here is the hepatic flexure where a good many people have trouble and think they have something the matter with the kidney because the bile is overloaded and dropping behind that little point, and it is attached here. This goes clear up behind the stomach, close to the diaphragm, and that is what makes pain on the left side. People very often think it is the stomach, cancer coming, or kidney, liver, or spleen trouble,--whereas the whole difficulty is simply in this little flexure. The bowel has been so loaded, dragging upon that little corner there that it has been narrowed and forms a sort of stricture, so that sometimes an operation is required. Notice where the liver is, and here is the gall-bladder.

This is to show you the stomach in its proper shape. This is the normal shape of the stomach; it does not lie transversely, but it is a vertical muscle. This is the pyloric portion over here. Here is the pre-pyloric sphincter. The food is digested in this part of the stomach, and then, as it becomes liquid, it

it is pushed over into this part of the stomach, and this part acts like the bulb of a syringe; it contracts and forces this liquid portion out into the small intestine.

Here is the portal vein, and here is another large vein, the ascending vena cava. This carries the blood straight to here, while this carries the blood around through the liver. All the blood that is absorbed from the stomach, the spleen, the pancreas, and the intestines,--these large abdominal organs,--all this blood is gathered up and discharged into this large vein ~~which~~ which passes through the liver, so that it shall go through the liver before it is distributed about in general. That is because Nature has made provision for our wrong doings to some extent; not really that, but it operates in practically that way,--that if we eat mustard, pepper, pickles, and spices of various kinds,--alcohol and other unwholesome things,--if we take them into our stomachs, these substances are absorbed and pass through the liver before they get into the general circulation. The first time you ever ate a piece of good old cheese, real old cheese, I should say, for no old cheese is good,--we would die^{of} intoxication, of auto-intoxication if it were not for this work of the liver. The first time the bowels were neglected, so that putrefaction took place in the colon, we would die of poisons if it were not for this action of the liver. These substances are absorbed, carried up to the portal vein, then into the liver, and filtered out to some degree; and that is the way the body is protected. Here is a portion of the liver here; here is the bile duct, and here is the portal vein running up into the liver. I am telling you about this, because pretty soon I am going to show you an experiment which is performed which is a very interesting thing in connection with this.

This is the normal liver, showing the proper shape. These are the left portion and the right portion of the liver. I saw some time ago a case in which this part was cut right off from this part, because a woman had worn her corset too tight, and many other cases in which this part of the liver was hanging down under this part because her waist had been constricted so much that the liver was pushed down out of place entirely. This is a diseased liver. This is a drunkard's liver, but it is also a dyspeptic's liver, a beefsteak eater's liver, a pepper eater's liver, a vinegar eater's liver, and a mustard eater's liver. Anybody who eats mustard, pepper, peppersauce, ginger or any of those things that burn and sting and blister as they go down, ~~xxxx~~ the throat,--anybody who eats anything of that sort is likely to have ^{gin liver} that kind of liver. Prof. Voix, of Paris, made some experiments by feeding these things to rabbits, and he found that when vinegar or acetic acid was fed to a rabbit, the rabbit was twice as likely to get this kind of liver as if he took about twice the same quantity of gin. In other words, vinegar ~~xxx~~ or acetic acid has twice the power to make gin liver that gin has; and pepper has six times the power to make gin liver that gin itself has. So you see, there is a good reason why we should not eat pepper, mustard, peppersauce and things of that sort.

Some time ago we had a gentleman here from Texas. I found he had gin liver, and I said to him very cautiously, for I thought he looked like a very respectable gentleman,, and I learned he was one of the trustees of a great college down there,--no, of a young lady's seminary, and I thought certainly he must be a sober man, and I hesitated to ask him if he was sober, or a whiskey drinker, so I said, "Of course, you have never used alcohol?" "Oh, no, never in my life; I never used anything of the sort." "You don't smoke?" "No, I don't smoke." I began to think, What shall I say next? Here he has got gin

liver, and yet he never took any gin in his life. Then I bethought me of these experiments by Prof. Voix, of Paris, and I said, "What part of Texas do you come from?" "Well," he said, "it is right down close to the Mexican border." I said, "I have been down in that region, and I know sometimes people eat peppers, rather freely down there. I suppose you never acquired the habit of eating peppers?" "Doctor," he said, "I will tell you the truth about it; I eat two big red peppers every meal. I can't eat a meal without pepper, and I eat two good big ones at every meal. I import them by the ton from Mexico. People eat them a good deal down there." I found the secret of the thing, you see. And it was pepper that Prof. Voix has shown has six times the power of gin ~~to~~ to make gin liver. And why? Because these poisons are carried into the liver. This shows the structure of the liver, and these are the liver cells which do the work of making bile, and (pepper causes) an excessive growth and an irritation,-- excessive growth of the connective tissue. You know sometimes you get a corn on your little toe, or ~~you~~ ~~get~~ a bunion on your big toe, or a callous on the inside of your hands somewhere where there has been undue friction or irritation, which causes that thickening of the tissues. These poisons do just the same thing when circulating through the blood,--they cause a thickening of the blood-vessels, just as in the liver they cause a thickening of the tissues of the liver, and in the kidneys they cause this connective tissue which grows so as to make a callous or corn in some persons; it causes this thick tissue in the liver which is the framework of the liver, to create a big excess of it, and it compresses the little sifter cells which do the work of the liver or kidneys,--these soft, jelly-like cells are compressed until by and by they are obliterated. This shows the process going on in the liver. These black spots represent the liver cells, and this was all covered with them; but now the connective tissue has grown and compressed them and obliterated them so that the liver has not more

than a quarter the power it ought to have. You say, "My liver is all right, because I never drank any whiskey;" but you may be entirely mistaken. Pepper, horse radish, worcestershire sauce, are all just as bad as gin to make gin liver, and the liver is affected. These terrible poisons that are absorbed from the colon,--Prof. Voix discovered that also. He took the bowel discharges, cultivated them in a tube, made cultures of them, took the colon bacteria cultivated them in tubes, made cultures, mixed these with the food of the rabbit, and he found these things gave the rabbit just that kind of liver.

This shows some other change which occurs in the liver. Here is cirrhosis of the liver, cancer of the liver, inflamed liver, nutmeg liver, fatty liver. These are fragments of diseased livers which show you what diseased tissue looks like. One of the reasons why we make a great point of examining the bowel discharges, the stools, is so that we can ascertain what is going on in the liver, and what the liver is contending with. If there is a great number of bacteria in the intestine, enormous quantities there, we know the liver has enormous quantities of these dire poisons to deal with, so we know what to calculate on. If a man has been going on for years and years with a coated tongue,--it is strange that people tolerate this condition. I met a gentleman the other day whose breath smelled like carrion, and his tongue was frightfully coated. You could not see it at all it was so covered all over with a green colored fungus, a dirty looking fungus that was growing on it. It is not properly a coat, but simply a green fungus like mold on the wall, like toadstools, mushrooms, and tissues of that sort,--excrescences growing there, producing foul odors. I said to this gentleman, "You have got a very bad tongue, a horrible coat on your tongue." He said, "Oh, Doctor, that is no matter; I have had that for many years." I said, "The longer you have had it, the worse off you are,

because that means your liver has all that time been dealing with these awful poisons.

This shows what we see when we examine the bowel discharges, the stools. Here are portions of undigested food. Here is some mucus up here. Here are some bismuth crystals, for the patient has been taking some medicine. Here is some wood charcoal. You can tell by the appearance of it something of what the wood was. Here are crystals from the blood, raw starch granules. We have made careful studies of this subject of raw food here, and we find when a person eats raw food, the greater part of the starch goes off in this form entirely undigested. Not more than ten percent of raw starch can be digested when it is eaten in a raw state, and some people can not digest that much. It is simply throwing energy away. These are simply fragments of undigested food, and foreign material of various sorts. Here we have more of the same sort, only a different sort of materials here, different kinds of vegetables, different kinds of starch,--potato starch, potato cells. We can identify them by their raw appearance. Then we find also germs. This particular slide shows us some of the germs, germs of the plague. These are the little germs that produce the disease known as plague, or black death; and here are the white blood-cells, the macrophags eating them up. Here are minute bodies of the plague germs, the plague bacillus; and here are the cells that have swallowed them and are digesting them, actually eating them up. Here are some of the germs that are often found in the colon. More than 160 different kinds of germs have been identified in the bowel discharges,--more than 160 different kinds, and about sixty of these are poison-forming germs. Here are some of these germs as you find them. When a baby is first born, there are no germs at all in the first bowel movements; there are no germs whatever, and when the baby is living on mother's milk, it has this kind of germs, harmless germs, sour milk germs, germs

that produce acids, the germ known as *Bacillus bifidus*; but we don't need to know the technical names of these. But when the child is put upon cow's milk, then there come two kinds of germs. You see here some red colored, large, thick germs here, which are another kind of germs. These are germs that are capable of producing poisons. These come from the cow's milk; they get into the cow's milk from the barnyard, and from the unclean udder of the cow. They are manure germs. They come from the colon of the cow originally, and these fecal germs which are in the milk are given to the baby, then the baby begins to have trouble every little while, especially if the bowels get a little bit inactive, the baby begins to show symptoms of poisoning. If they multiply and an extra large number of them develop, the baby has an attack of diarrhea, green stools, or of dysentery, or some other trouble due to germs with which the baby was inoculated by its food ordinarily. Maybe the baby has been allowed to get down on the floor, or the father has been outdoors in the barn, and he comes in with a lot of barnyard germs on his shoes or pants. The dust of the street always contains great numbers of the dried up excrements of animals; and some of this dust is brought in with the shoes, is rubbed into the carpet, and the baby gets down on the carpet with its toy, perhaps a little rubber ball, or ring, or something, covered with saliva from its mouth,--gets down on the carpet, gets it all smeared over with germs, wipes them up off the carpet, and then back into its mouth it goes, so the baby inoculates itself with filthy germs from the street. The baby should never be put on the floor without a clean sheet under it, a baby that is doing things of that sort, because it is one of the most dangerous things you can do with a baby,--put it down in that way where it can scrape up the dirt and put it into its mouth, because a germ in a baby's alimentary canal can make just as much poison as in a man's alimentary canal, but the baby can not stand so much poison. It takes a smaller dose of

to kill the baby than it does to kill the man--a very much smaller dose. You see a baby can get a dose big enough to kill it very easily if it is inoculated in this way. The baby grows up, by and by begins to eat meat, and germs can grow and multiply, and a large number of these large, very virulent germs grow there, and the child becomes subject to different troubles, to catarrh of the bowels or chronic catarrh, colitis, and other troubles that grow out of these organisms that we are surrounded with all the while, that were formerly supposed to produce no particular injury. They largely come from meat, which always has these bacteria in it, because it is always undergoing decomposition. (You can not find a piece of beef in a butchershop anywhere that is not already decayed. When an animal is just killed, its flesh is tender, like jelly, so that you can rub it up with your fingers into bits; but when rigor mortis takes place, and the animal stiffens, the flesh never becomes tender again until the putrefaction sets in, and the more putrefying it is, the more tender it is. You say, "Oh, but it does not smell bad." But that is the deceptive thing about it. It has recently been discovered that there are certain kinds of putrefactive germs that grow at a temperature of 40°, and when the meat is kept in a refrigerator, kept in cold storage, the process of decomposition is going on, but it is carried on by a peculiar kind of putrefactive organisms. They are germs that grow without producing any odors; they do not produce aromatic substances, do not produce any foul odors, but produce decay, and toxins, just the same.) Ptomains are there, and the process is going on.

a plate

This is the actual appearance of ~~black~~ from which a culture is being made. A very small amount of the bowel discharge is mixed with gelatin in a flat plate, preparing a plate culture with gelatin, and this is put under the microscope,--first it is put away in a warm place ~~for~~ at 100° for twenty-four hours, then it is put under the microscope and you can see these black spots

which are colonies. Each colony is a place where just one germ was located twenty-four hours before, at the beginning of the experiment, and it has grown until there are some millions located in this little spot called a colony. These colonies are counted, and in this way we find out how many are alive. We have recently improved our methods so far that we are now able to count not only live ones, but dead ones also. This is a very important matter, because not infrequently it was found there were ninety-nine dead ones to one live one. The germs had been killed off by their own poisons retained in the alimentary canal until they were actually killed off. Sometimes we have found as many as twenty billions of these growing germs alive, active and growing, and producing poisons in a quarter of a teaspoonful of fecal matters; so you can see what enormous numbers there are. I was noticing a case the other day in which the total number of germs had been counted, and it amounted to 112 trillions. That is quite a considerable number, isn't it? --produced in twenty-four hours. And Prof. Strassburger has stated that the number produced in twenty-four hours may rise as high as 300 trillions. I have not seen a case quite as bad as that, but I have no doubt we shall get to it.

Now, I am going to tell you of an interesting experiment which I have seen myself and which I know to be an actual fact. Here is a diagram of the liver. That is the portal vein that carries through the liver the blood absorbed from the stomach, and carried away from the stomach and the intestines and all the abdominal organs. This blood that travels up to the liver contains the digested foodstuffs that we take in, and the mustard, pepper, wine, beer, and all the other things, --tobacco juice if we have been swallowing that filthy stuff--that goes along with the rest, and goes to the liver.. If we have been smoking and the nicotin has been absorbed, that goes to the liver just the same; the liver has to do something to that. Now this is the experiment. The por-

tal vein is attached to the ascending vena cava, which carries the blood directly to the circulation,--cut it. After it has been cut, by anastomosis in a very interesting way, this portion is cut out, so the blood which formerly went to the liver no longer goes to the liver, but goes directly to the circulation. So whatever is eaten and digested, instead of passing to the liver and being sorted over and filtered, ~~xxxx xxxx~~ goes straight to the general circulation, goes around to the rest of the body. This is what is known as Eck's fistula; and when that has been performed upon a dog, the dog runs about and seems to be as well as any other dog and as healthy provided you keep this dog on a non-flesh diet. If he becomes a vegetarian like me, or a flesh abstainer, he has no trouble; but if that dog is fed on meat he is a dead dog in three days, absolutely; there is no exception to it; the dog is absolutely certain to die in three days if he is fed on meat. Why? Why, because meat contains poisons which the liver must remove; meat produces, gives rise to poisons in the body, through putrefaction, which the liver must remove; and if these poisons are left in the body, in the blood, death occurs very quickly. It takes only three days for these poisons to accumulate to a fatal dose in the case of the dog when the dog is deprived of this disinfecting action of its liver upon these poisons.

Now, I want to ask you what happens when the ~~knik~~ ^{bowel} gets into this condition, for example. This is the cecum, and this portion of the colon should pass straight across; this is the transverse colon in a state of prolapse, and the cecum enlarged. That is the condition of a person who has been suffering from inactivity of the bowels for many years; it is like this, or it may be even worse. There are various forms. This shows the healthy colon, the normal transverse colon, the descending colon, and here is the small intestine. This condition of things may become so bad that it can not be easily remedied.

Dr. Arbuthnot Lane, of London, finding many persons suffering from autointoxication because of this condition of the colon--dilated colon, prolapsed colon,-- he devised this operation for effecting a cure. The small intestine which empties into the colon here at the upper end of it, five feet from the lower extremity,--this small intestine is brought down here at the sigmoid flexure, which is only a few inches from the exit of the colon, and by anastomosis a connection is made here so it can discharge directly into this part of the colon. Then this is cut in two, cut off so that this part of the colon is entirely retired from activity, and from this point down is the only part of the colon that is used. Dr. Arbuthnot Lane found this operation performed upon patients gives great relief; that sallow, leather colored skins clear up, get rosy colored again, and clear complexions. He sent me some years ago a copy of his paper, and I happened to have at that time a patient in this ~~same~~ same condition. I had to do another operation, and I thought I would do this operation at the same time, don't you see. This patient's bowels had never once moved in all her lifetime without medicine, since she could remember. She had not had a natural movement of her bowels in all her life-time. She could not possibly remember when such a thing had happened to her. She had with her a grown up daughter, a fine girl, about twenty, with a beautiful, fine complexion, white skin, while the mother was the color of leather. The next day after the operation the patient's bowels moved three times naturally, and now some three years have passed and there is no difficulty; but the beautiful thing about it ~~was~~ was that in six weeks after the operation, her skin was ~~xxx~~ as clear as her daughter's. But this is a very difficult operation and would be fatal in some cases, because this is the most dangerous part of the intestine to operate upon, because it is so full of enormous quantities of germs, and so thoroughly infected. Dr. Lane found the fecal matters would sometimes back up, that this became a blind sack,

and they would back up, fill this up, and the patient's condition was worse than before. So he was gradually led to cut off the colon more and more. When I saw him in London a few years ago, he was cutting it off here. Now he is cutting it off here; so he removes the whole colon, and he finds the results most satisfactory. He showed me, in his large hospital in London that he has charge of,-- he is the chief surgeon there,--he showed me a number of patients two of whom were trained nurses, and a number of other patients that he had performed upon, that were made marvelously well, that made wonderful recoveries in a short time by simply getting rid of this cesspool in which these seething matters, decomposing, decaying matters were sending poisons into the blood; and another professor has recently taken it up and made some very interesting observations about it. This was Prof. Metchnikoff. For some time, you remember, Prof. Metchnikoff has been advocating the idea that the colon is the source of the poison which produces old age, that old age is simply chronic poisoning, autointoxication; that it is the result of poisons formed by germs which get into the blood, harden the arteries, and so cause withering of the body from lack of nutriment. Now, he has ~~xxxxxxxxxxxx~~ attributed this to the colon, and has called attention to the fact that the animals that have the longest colons have the shortest lives; and that the long lived animals all have short colons, which is certainly a very interesting observation; and Prof. Metchnikoff remarked in a book written five or six years ago, "Now, we have already begun to abbreviate the colon by cutting off the appendix, and we should go on a little farther and cut off the rest of it, and if we should do that, we might extend our lives enormously; and Prof. Arbuthnot Lane has been actually doing it, and reconstructing people, rejuvenating them, by getting rid of this horrible source of poisoning. At first I thought that we should probably have a great deal of this

sort of surgery, to do because it seemed to be an exceedingly practical thing, and the results obtained from my first case that I operated on were so excellent I thought we should do a good many of those operations; but I have not found it necessary. (I found when we came to get the idea of an antitoxic diet thoroughly systematized and organized and trained down to a fine point so we could really manage the thing thoroughly, we were able to prevent this putrefaction in the colon without sacrificing the colon; and that is the real remedy--is to subsist upon a dietary which will not decay. Why should we put into the colon things which will decay? Why should the foodstuffs which we take into our bodies so sweet, clean, and pure,--why should they become polluted within our bodies? Why shouldn't they remain just as clean in the body as they were before? There is no logical reason; there is no really necessary biological reason why the material which goes into our bodies should contribute to the building up of our physiologic frames should not remain just as sweet and clean while in the body, and in the remnants at their exit from the body, --just as clean and wholesome as when they entered. Down in South America, Prof. Metchnikoff says there is a certain parrot that lives on bananas, and the bowel discharges of this parrot have the fragrance and the odor of bananas, and not the least unpleasant thing about them. There is no reason why there should be. It is because of the putrefactive changes which take place,--changes which are ordinarily quite unnecessary. I say quite unnecessary, because Prof. Levin has been making studies of animals in the Arctic region, at Spitzbergen, and in examining 153 animals, he found 55% of them had colons absolutely sterile.) They were examined very minutely, and the colons were found absolutely sterile. But our bodies are in such a state as they are because we are living upon such an atrocious diet, because our bodies have become so weakened they have lost their power to defend themselves against these atrocious germs, and to destroy them, that we have become invaded by these hosts of filthy, poison-producing microorganisms.

(The great business of my life for several years back has been to find out how to cast these invading bacteria out, and to keep them out. They are just as hard to get out as are bedbugs to get out of the house, and to keep out as cockroaches are; because they are continually swarming in. Every morsel of meat you swallow carries down millions--every morsel. But you say it is cooked. Yes, but the cooking does not destroy these germs in meat. They are so tenacious of life that they resist the cooking of meat. The spores are not killed unless the meat is cooked at a temperature of 240° .) But I am taking too much time.

Here is another case--an enlarged cecum lying down upon the rectum, and this person would be teased and teased, tormented by a desire to empty the bowels because of this pressure of this mass upon the rectum. I just examined a patient who has just such a state as this. Here is the appendix. In the enlarged infected cecum, where these germs are operating upon the fragments of undigested meat. (Suppose in your house you should find your cook had left you, and you should find the cook had left a piece of chicken in one corner, some fish in another corner, fragments of salmon or some other kind of fish, dead fragments of other beasts around in different parts of the kitchen, you would say it was a very filthy cook, and that kitchen would be in a horrible condition. And that may be exactly your condition. You may have a whole menagerie of fragments of dead beasts lying down in the cecum decomposing. It is a most common thing to find that state of things. When I begin to examine a ~~man patient~~ the abdomen of a patient, I always examine the cecum first. I find in my examinations very often a cushion sensation. That is an expression invented by Prof. Roger, of ~~Kxxxxx~~ Lausanne. That means it feels like a pin cushion or something else; it means simply a great mass of fecal matters accumulating there, and nobody knows

how long they have been there. Sometimes they have been there three or four weeks,--putrefying remains of dead animals, putrefying there, and just as rotten there as they would be outside, and the poisons produced by this horrible filth smell just as bad as though they were outside; and these horrible odors and stenches are absorbed into the blood, ~~ga~~ and come pouring out into the breath, and the perspiration,--do you wonder you have to have a scent of some kind on your handkerchief, cosmetics of some sort to cover up these horrible scents, and the horrible blemishes produced in the skin,--the pimples, and the brown spots around the eyes, the horrible skins that come as a result of the flesh eating habit? My friends, I don't believe I am exaggerating a bit when I say it is one of the most horrible things that has ever afflicted the human race,--this habit of subsisting upon the bodies of beasts. I believe it is the greatest evil that exists among us, and is responsible for more mischief, more disease, more deaths, and, I was almost going to say, for more immorality, and I am not quite certain I may not go that far.

A businessman was telling me not very long ago how when he used to be a flesh eater he used to get up in the morning feeling horribly cross, depressed, all out of sorts with all the world, out of joint with everybody. He would come down to the breakfast table and get into a regular row about some little thing, abused everybody at the table; and when he got down to the office, he abused everybody down there; everything would go wrong all day long, and he just lived in a horrible turmoil, and that sort of mental pandemonium all the time; but since abandoning flesh eating, getting his brain cleared out and his blood clean and his breath sweet, he is a different person. He said, "Why, I am at peace with all the world; I don't have any trouble with my nerves; I am simply happy, peaceful, enjoy life all the time, and it is just simply the difference between being intoxicated, dead drunk with food that was undergoing putrefaction--

just simply the difference between being intoxicated and being in a state of blood-purity, and cleanness of breath, sweetness, of temper; and a brain that is suffering from the terrible intoxication of these putrefaction poisons.

See what a state of things comes here. I have seen this very condition. Sometimes it gets twisted clear around into an obstruction, and the doctor has to perform an operation, perhaps cut off a piece of it. Here is another form of obstruction in which there is a union of the sigmoid flexure, and the prolapsed, transverse colon, an enlargement of the cecum--a very common combination. Here is a large diagram showing how the cecum becomes enlarged, and how it stretches at the points of attachment so that there becomes a stricture here, and the patient feels pain as the alimentary mass is moved around this hepatic corner,--he feels a little pain and a heavy load here in the center,--a dragging down sensation; and when these putrefying masses lie for a long time in contact with the mucous membrane, mucus is secreted in large quantities to ~~protect~~ protect the living cells against the absorption of these poisons and against infection by the germs; then these masses of mucus will sometimes be discharged; and that is what is called colitis; that is catarrh of the bowels. Mucus is not harmful; it is protective--for the protection of the body.

I have been talking altogether too long,--am going to bring my remarks to a close right away. This is the transverse colon fallen clear down into the pelvis. I have met this condition more than twenty times in performing some operation.

Here is a very young baby's face. I want to show you these faces and let you see which is which. This is a baboon's face. You see it looks wonderfully human. They are friends, relatives, kin of ours, and set us a good example in diet. This is the face of an orang-outang,--a creature that is akin

to us, and whose example, as I said, we should follow in diet, because of the similarity of structure and function. If we want to find out what is the natural diet of man, we can not find out by looking at men, because men have wandered so far away from the natural way. We have got to treat a man just exactly as we would the fossil remains of some animal that had disappeared from the face of the earth--an extinct animal. If we found a skeleton of such an animal, we would examine it, compare it with the skeleton of some living animals; we would study their habits; and if we should find this skeleton was like the skeleton of animals that are living, we would say its habits and diet were like those of his living counterparts. So, if we would treat man like a fossil, extinct animal, examine his skeleton, compare it with different animals, many forms of frugiverous animals, etc., we would find it compares so closely with that of the orang-outang and the chimpanzee--we would find that it compares very closely with that of the human being.

Here is a picture of the outdoor gymnasium. I hope everybody will get into it. You can get closer to nature there than anywhere else about here. I know some people are getting enormous uplifts there every day, because they go out there and get great doses of sunshine. Sunshine strikes in if you give it a chance. The hot sunshine goes down into the skin two or three inches, into the body right through the skin; so when the body is exposed to the sunshine, it is filled with light, and there is marvelous power in the light. We know what happens to the earth when the sun comes and shines upon the grass. The same influence is exerted upon our bodies when we bring them under the influence of the powerful rays of the sun. The sun is the great source of energy and of life to the world, and we may get large doses of it without any ~~charge~~ charge. There isn't any extra charge for treatment in the outdoor gymnasium. There is nothing equal to swimming as exercise; it is the best exercise there is. With

the scanty clothing which is fashionable down there, one can get all the Nature that is possible from these opportunities. Here is the sand-bath which our healthy folks and unhealthy folks enjoy enormously; and the swimming pool where there is a chance to get a bath and get some exercise at the same time.

I am showing you these flowers here in order to blot out the memory of those awful germs we have been talking about, so you will forget all about that and think of these flowers and try to be like them.

Now we are going to hear from our friend, Mr. Goodwin Brown, of New York City. He is one of the leading lawyers in that city--and very prominent in the state organization, and on many state boards a good many years, and he became acquainted with Mr. Horace Fletcher a number of years ago, and has been practicing fletcherism, and has had a very interesting experience. Among other things he has contributed a very valuable work to the world,--"Scientific Nutrition Simplified." Some of you have tried to read Chittenden and found it a little hard to understand, but you can find this book has beautifully summarized and simplified the work of Mr. Fletcher and Prof. Chittenden; ~~and Mr. xRiatx~~
~~xxxxxx~~ Mr. Brown's book also contains the theories of Mr. Fletcher presented in a very admirable way.

Ladies and gentlemen: I have the pleasure of introducing Mr. Goodwin Brown, of New York.

Mr. Goodwin Brown. I came up here myself to see Prof. Kellogg. I had heard so much about him, known so much about the work of the institution, that I have been looking forward for more than a year to seeing him. I was quite anxious, in fact, to see the man face to face, and have a little talk with him. I confess I am a little embarrassed in a place where there are so

so many people who know so much about the subject. I think it was about four years ago that quite by accident, I saw a magazine article by Prof. Chittenden. It is altogether likely I should not have paid any attention to the subject, but many years before, when I happened to be a public officer, I had had occasion to employ the work of Prof. Atwater, and before him of Prof. Austin Flint, of New York, said at that time to have been perhaps the most distinguished physiologist in the country; but I don't know; I may be in error. I became very well acquainted with Prof. Atwater and learned a good deal about the subject; but it never occurred to me it was worth while to apply it to myself. I simply was looking out for the vast numbers of the insane of the state. But I did get in touch with scientific work, and I ought to say here, perhaps, that I took part in establishing, perhaps the first really scientific institute of research in this country, which antedated the Rockefeller Institute, which antedated the Carnegie Institute. When my associates and myself took charge of the insane for the State in 1890, when we consolidated all the interests of the state and brought them under one system, it became necessary for the first time to consider the proposition as a financial one, and one of the first questions that arose was how much food the insane should have. We were responsible for the amount of food allowed, and we were responsible also to the legislature for the money expended. If we arbitrarily reduced the diet, there was a chance for some one to say that we were ignorant and we had cut it down too much; and on the other hand, if we raised it, they might say we knew nothing about the subject, and had given too much; so we employed Dr. Austin Flint, and afterwards Prof. Atwater, and by and by it came along, and we said, "Why, if there is any way by which large numbers, or greater numbers of these insane can be restored than are restored, let us find it out." And we agreed among ourselves that we would

establish an institution purely for scientific research. And to that end, we went to the Academy of Medicine in New York and asked them to suggest. We said, "Now we will appoint any man that you suggest as proper to head this institute." That institute was established and the work begun; and we spent what might be considered a fortune in providing it with scientific instruments; and we felt at that time that if nothing was discovered in ten years, or if nothing was ever discovered that at least it could be said that the subject had had the benefit of the ablest scientific minds that could be found. So, as I say, in course of time we began to apply the same methods to the subject of diet, so that in a way I had had some preliminary preparation for what was afterwards to be applied to myself. You know we are very much apt to try to reform everybody else before we begin with ourselves. I have had some experience along that line. But there came a time when I really felt as though a reform within the party should be undertaken; and when I saw that article by Prof. Chittenden it made such an impression upon me, such a profound impression upon me, knowing his standing as a physiological chemist, I at once said, he was the first in the land, he certainly stands among the ~~first~~ very first. I was profoundly impressed by it. At that time, I was fifty-three years of age, and I weighed 190 lbs. Some people thought I was going into premature decay. I was substantially played out. But I read this article with vast interest, as I say, then shortly afterwards I learned about Mr. Fletcher. Then I began with great energy to apply the theories of both. And after a little I went to New Haven, had a talk with Prof. Chittenden about it. I really was alarmed, I confess I was, and my friends were more alarmed than I was, because at no time, I might say, during the experiment, was I free from very careful medical observation, because I always had a doctor, for I thought it was not worth while to commit suicide for

for the benefit of a cause. And I went to talk to Prof. Chittenden about it. He said, "Don't be alarmed; you are certainly eating enough, maybe too much;" yet I had cut my diet down certainly two thirds, because I had been a fairly liberal eater,--I won't say a gross eater, for I would not like to admit that; but I was what you might call a liberal eater. I liked the habit of clubs, and looked out for good things, and it was said by some people that my cellar perhaps contained more of the rarities of the earth than many cellars in my immediate locality; but in the meantime I had shrunk. I used to pride myself, when I was about fifty, that I had certain aldermanic proportions; my clothes were well cut, better than they are today, and I really prided myself, I might say, on my ponderosity. I really thought I was a good looking chap. You know we used to talk in the old days about an alderman. He was the type of the elegant gentleman, so to speak; but I began to shrink, and I shrank to such an extent that my wife and my friends particularly were exceedingly alarmed. But it occurred to me to bring to my aid some of the science that I knew was floating about, and I went down to Dr. Rogers, the chief medical examiner of the New York Life Insurance Company, whom I knew very well, and had a talk with him, and he said, "I would like to take your blood-pressure, Brown", which he proceeded to do; and up to that time, I had known nothing about blood-pressure. As a result of that examination, he said, "You have the lowest blood-pressure of any man I ever saw, and if you care to apply for one hundred thousand dollars of insurance, I would issue it at once." Then I had an examination by my own physician. I told him particularly, "I shall hold you personally responsible in the event of my death; I shall expect you to examine me every two weeks and keep me informed, because I desire to live." He thought I looked a little bit, as I said, shrunken, but in the meantime, I suddenly found I had the energy so to speak, of a wild cat.

It was simply amazing. People whom I walked with asked me if I was going to a fire. I was not aware that I was walking very rapidly. But the fact was I was going upstairs with great rapidity, and going everywhere else rapidly. Now that continued. That was perhaps more than three years ago. In the meantime I had persisted in it, because I am a very determined man about some things; and I thoroughly believed this was right. I believed it as absolutely as I would believe an engineer who told me that a bridge was safe to walk over, or who should tell me that a bridge was unsafe to walk over, I ought to say. It is amazing how much we will believe about electricity, about engineering, and about the railroads and about everything in the whole line of human activity; yet when some scientific man of equal attainments asks us to believe something about the human body, they say, "Well, that is against all human experience, and I propose to do just exactly as I always have done." Now, that is amazing why that should be so, why people should believe things which are not capable of demonstration, and should disbelieve those things which are.

Now, to come back to myself, e-for a time, my skin began to adjust itself to the new conditions. My weight went off 55 lbs., and I got down to 135. I sold the old clothes I had,--I made quite an advantageous sale to a youth who came up to see me, and we reorganized, so to speak. I went down and had my hair trimmed, and we started out on a new idea. I began to drink a little bit less. I never was a very hard drinker; I simply was one of those amiable men that like to take a cocktail, don't you see, before lunch, and something in the evening; and I liked to smoke a little. But by and by people began to say, "Why, Brown, what have you been doing? What has happened to you? You are growing young." I got that right from my wife. And I instantly said to her, "Now, look here; you are about the same age as I am; if you want to join the procession,

I should be very glad to have you. But I want to say to you with very great frankness that you will be out of my class in a very short time, unless you come into the game." Now, I happened to have a young son, not so very young either--about thirty,--a corporation lawyer, who looked on this scheme with the utmost contempt. He had all the pride of modern education. He watched me, hardly able to conceal his contempt, and he said to me one day, he said, "Father, I have been watching you pretty carefully. You are eating a great deal more than you think you are." I said, "My esteemed sir"--I was careful to address my son that way,--I said, "if you will take a pad and carefully note down,--you are a lawyer; there are some ethics in the profession which you are bound to observe--and carefully note what I do eat, and then kindly tell me if your suspicions are justified." After three days he said he was satisfied that he was mistaken. Now, in regard to that boy--I shall speak of him as a boy for some time,--that boy had asthma, a typical case, asthmatic,--tall, thin, a spare, peaked nose--all that--suffering fearfully from asthma; but by and by he discovered that there was some sort of relation between intestinal disturbance and asthma. In other words, he found that when he had a terrific attack of intestinal disorder, that likewise he had asthma. That seemed to be born in him. Then he began to modify his diet, and then about that time,--he was a steady boy,--he very fortunately went down and married a farmer's daughter, much to my surprise, and I may say gratification,--a girl of considerable education and intelligence, and she was smart enough to see the point. Now, what is the consequence in regard to those two young people? Both are fully restored to health. My wife to some extent has come into the game, to permit the expression. I don't think she will ever masticate her food in the way that I do, but she has certainly cut down her diet enormously, and is trying to reduce her weight; I am happy to

tell you that. And she has become convinced that eating meat is a bad thing; so that we really have gut down to this point--where I think meat is served about once a week; she really thinks as a concession to public sentiment, that there ought to be meat once a week, or at least fish.

Now, I have learned something today up here; I really think the time has been well spent. I don't think I ever should have got here, much as I wanted to come, except for a business matter. I happened to ask Dr. Kellogg today about red meat and whitemeat, and we got into a discussion about the subject, and I learned that of flesh that fish was far more likely to be contaminated than almost any other kind; ~~xxx~~ so I think we will cut that out. Now I don't profess to be a vegetarian. I want to say just a word about that. But I have found through Dr. Kellogg, Prof. Chittenden and others that there is no special point about eating decaying animal food,--that you can get your protein in some other form just as well, and something that is clean. Why, when you stop to think of it,--what it is to eat putrifying flesh in a state of arrested decomposition,--I don't think any of us ever thought much about it. I used to look at those luscious steaks, at those hind quarters hanging up in the butcher shop, in the old days, I used to haunt the markets of New York, go down to see what there was in the way of sweetbreads and other delicacies. I would not think of it today, not for a moment. I don't suppose I have eaten in the last month,--I do make a concession sometimes because it is easier to take poison sometimes than it is to get up a discussion on it,--but I really think I shall give that up. You know, I think there is such a thing as being too polite, and I am afraid I have been. I have sometimes in my life drunk a good deal more wine than was necessary in order to, you might say, preserve the amenities, but I am satisfied now that Smith Williams has shown us what there is to that, and I think I will discontinue that; and pretty nearly everything is gone,--meat,

tobacco, rum,--I don't know of anything more. I quite agree with Mr. McClure about coffee. I spent years in inventing a coffeemill. I worked at it a long time, and finally succeeded to such an extent that a New York broker was willing to buy it. I really went into that as a side issue, because I found it impossible to get a decent cup of coffee in the average hotel or the average house; and I said to myself, "I will invent a machine for the purpose that is automatic; in other words that will be proof against ordinary, average, unusual ignorance. And I succeeded in doing it, but I think, from what I learned today, that that will have to go; but I shall sell the machine--if I can.

Now you can see for yourselves,--perhaps I am not altogether lovely to look at, but I think you will agree that I don't look like an invalid, hardly. Now, this is the fourth year in which this has been going on. About a year ago it occurred to me it would be more convenient to give up breakfast than it would the evening meal. And really, since then, I have taken on a new lease of life. When we used to have a family dinner and all the family got together in those happy days you have all heard about, everything was discussed, and the roast was put on the table, and the dessert served, and all that--in those days after I had eaten that family dinner, I had a strong inclination to lie right down on the floor. If people came in to call, I was impolite up to the point of rudeness; I simply ceased to talk, and by absolute silence indicated I wished them to go; that I wanted to get on my back; and the house was closed up. Now, signs of revelry, so to speak, have begun again. In other words, I simply have gone back about twenty-five years, when I used to hunt various places where good things were served, and I sit up nights once in a while. I really am beginning to have a good time. I do not suppose I ever get to sleep before midnight. I read every night. When I built my new house last year, I had it arranged so I could pull a ribbon and pull on a Tungsten light at the head of my bed; and

every night I read until midnight, and sometimes later than that. I get up at from six to half past; I spend an hour at my toilet--I don't think there is any prohibition on that that I can discover. I cut out my breakfast because my retiring, you might say, is a sort of movable affair, sometimes half past twelve, sometimes one; and it occurred to me that I might just as well leave my breakfast out; and I found out that really I would not fall down in a dead faint if I went without it. You know we hear people say right along, "Well, I really must eat; I must keep up strength." We have in our office as fine a young specimen as you can imagine,--a graduate of Princeton College, a very promising lawyer, an athlete, one of these modern specimens that you have seen, and he said, "Why, Brown, really, about five o'clock I begin to get that sinking sensation. I could not do that." He really believes it.

I cut out the breakfast, as I say. I found there was no point to it. I had been in the habit all my life of regarding the breakfast as a foundation stone; and on my card index in my office is a little editorial cut from the London Lancet to the effect, ~~ixax~~ substantially, that the man who could eat a big breakfast was the man who made his way in the world. We are all familiar now with the argument, but to me it was a new thing, and I cut that out, and immediately I cut out the breakfast, I found curiously that I did not want it. I came down in the morning, lit a cigar, read the New York Times, and started for New York. And so it now happens frequently that I do not eat all day. And I come home and eat a light supper. Why, the housekeeping is all gone to pieces in our establishment. There is only one meal a day served. Really, there isn't anything doing. You would be surprised. The only drawback I find is there is some objection to inviting a raft of people there to be entertained. We can not have much cooking going on in that family, and of course we can not

bring other people all to our own ways of thinking. However, I have decided, for the good of the cause, to let that go. We are having a pretty good time as it is. Now, this thing may be wrong. I think it is right. During the past four years, I have gone through tests by Dr. Anderson, and so far as I could see, I was sound. I have gone to see Prof. Chittenden; and you can see for yourselves what my physical condition ~~xxx~~ apparently is. Certainly I have five activities today where four or five years ago I had one. I am a very active man in my way,--not tremendously important things, but things that are important to me; and I find that I can accomplish them all, and that I have time, so to speak, to burn,--in fact, so much time that I don't know what to do with it, sitting around the house waiting for somebody else to call up on the telephone, I am so anxious to do something. The doctor said, "Brown, you must not read; you are getting so along in years your eye sight is ~~xxx~~ getting bad; you must not read"; and I really can not get a chance to play bridge whist more than three times a week, because the number of people who can really play a good game is rather limited; so really I don't know hardly how to use my time. I am really thinking seriously, Dr. Kellogg, of giving up tobacco, after that talk about it; and I am afraid the last bottle of ale will have to go; so possibly the last state of that man will be worse than the first.

But if there is anything in personal experience, I certainly ~~think~~ have carried this thing out with great persistency,--if there is anything in personal experience,--the theories of Prof. Chittenden, of Dr. Kellogg, of Mr. Fletcher are absolutely demonstrated; because, so far as I can observe, I have gone back twenty-five years so far as my health and activity are concerned. Why, the last year--let me tell you about that. I had forgotten all about it. When I was a young fellow in college, you would not think it, but I was quite a

swell. I wore pretty good fitting clothes, danced a good deal, and, in fact, made quite a career in college along those lines. But last summer I went up with a party of gentlemen to one of the lakes of the state, to spend a night in a clubhouse. We had a good time, played cards, etc., but some of the others, as I myself found, there was a ball going on near by, and one of them said, "We better go up and see what is going on;" and I went up, and there were some gentlemen acquaintances there, and by and by we got some introductions to the girls, and one of them said to me, "Why, you are the highest old sport I have run across in all my life." I danced for two hours. Now, think of that. The first time I tried that, I think fifteen years ago, "I almost fell down in a dead faint. That is a fact. And I danced with those girls for two hours, and never turned a hair. Now, really, you know, it is something for a man at my age to be able to do that, when you think of it. Of course, I don't do it right along. I didn't need to talk so long. I didn't expect to say anything more, but Dr. Kellogg has been so exceedingly courteous, has told me so many things, and I feel so vastly benefited, I want to say a word about this place. I know something about these institutions. But this is the only one I know where there is a scientific atmosphere about it; and I really believe this has. I took treatment myself this afternoon, and I feel very much refreshed; and I am exceedingly obliged to you, Doctor, for giving me this opportunity, you may say, at this experience meeting. Good night.

Dr. Kellogg: My friends, I am sure you have all been greatly interested in what you have heard from Mr. Brown, and we thank him very much for giving us this little account of his experience with Fletcherism and the low protein diet. Some of you, perhaps, do not understand that in talking about Chittenden's views, he means flesh abstaining,--not absolutely, but eating so little flesh it really amounts to nothing; it means low protein; that is what it

means--just as low as possible, without depriving the body of anything it really needs to leave out all those luscious steaks he referred to, that he used to like and does not care for any more. Leave out all those ham sandwiches, oyster stews, and that sort of thing which consists of surplus protein. Really, ordinary food naturally contains all the protein we need. We are going to save Mr. McClure until next time, but he wants to say just a word. I see we haven't got as much of an audience as we ought to have to hear Mr. McClure, to hear the good things he is going to tell us, but he will say a word.

Mr. S. S. McClure: I will make a present of a good idea to all the people here tonight. This man, Mr. Brown, has written a small book that you can buy for seventy-five cents net, that you can read in about two hours, that gives the best conspectus, the best story of ~~xxx~~ how all these things happen, excepting Dr. Kellogg's work, that you can find anywhere. It tells the accident by which Mr. Fletcher began; it tells how he got into the University of Cambridge, in England, and of Yale in America, to make these investigations. He goes on and describes the results of all these men's work, and in two hours, if you read Mr. Brown's little book that you can buy at the bookstand here for seventy-five cents net--you can not get any discount on that book,--you will know almost as much as Mr. Brown knows, and as much as I might tell you if I knew a great deal more and could talk to you for about two hours. And it is a very remarkable thing that just at a time when life insurance companies and statisticians have discovered that people were dying more quickly after they got to be forty years of age, with Metchnikoff, of Paris, and Dr. Kellogg here in Battle Creek who have been discovering the reasons; and with Mr. Fletcher and Dr. Kellogg who have been discovering the remedies. This is all a new

body of knowledge that few people know anything about, that has been brought into existence within twenty-five years, much of it within five or ten years; and this small book by this interesting man, Brown, will tell you all I could tell you if I should spend two hours tonight; and tell it to you much better than I could tell it to you ~~as~~ possibly; and I advise you to get that book; and I am going to ask Dr. Kellogg to put upon the black board out there a small list of books which will enable any one to learn enough about this subject to manage his own personal affairs in trying to keep well. (Applause.)

Dr. Kellogg: I have a letter from Mr. Horace Fletcher today. I was telling you something about the interest at Chautauqua. He writes me the tide is still rising, and he is talking to large audiences in the large auditorium there telling the people about this health and efficiency movement we are telling you about, or that we told you about the other night; but that was not what I was going to tell you about. Mr. Fletcher is coming east, and you will all have the pleasure of seeing him. I am sure you will all be very glad to give him a very hearty welcome.

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VITAL

Economics
~~EFFICIENCY~~

A Lecture at the Sanitarium Gymnasium, Battle Creek, Mich., Thursday, September 2,
1909, at 8:00 P. M., by

Dr. HORACE FLETCHER.

Dr. Kellogg: We have come to hear Mr. Fletcher again, and he is already loaded with some splendid information and instruction for you. First we are going to have a glimpse of the Battle Creek Sanitarium in motion. We are to have some motion pictures in which you will see Mr. Fletcher at his best. All of these moving pictures are made by the Sanitarium photographic department, in charge of Mr. De Vaalt, and the whole thing is done on the premises. Our photographic department does about everything that is done in that line.

Mr. Fletcher: Ladies and gentlemen: I have been impelled to take the moving pictures for my text tonight, and let me say, by word of apology and explanation, that I have no particular conceit for my acrobatics. It is merely an effort to show what is possible to be done after middle life through a process of care in one's nutrition. When I was a young man twenty-five or thirty years of age, I had some skill as an acrobat, as a gymnast, but for more than thirty years I have not practiced any of those movements, and what was done yesterday by way of an experiment was in the nature of a test; it was to see how one retains his skill and his co-ordination, and also to show the activity possible to a person who has become rejuvenated, who through recuperation has become rejuvenated at the age of sixty; therefore you saw on the screen an attempt to reproduce, after some

duce, after some thirty years, what were the habits of thirty years ago; and I may say that as far as the judgment was concerned, the co-ordination required to make the proper turn and to land properly in the water, that I was able to do the feat yesterday as well as I was thirty years ago. Not only that,--it didn't seem to be very rapid work, but from the time the word was given to go--a stop watch was held,--the complete undressing, the mounting to the springboard, the somersault, and landing in the water was accomplished inside of a minute; and that I want to call attention to because you may have wondered, perhaps, at the costume that I wear. It is an evolution; it is a copy of costumes that I wore in Japan and China more than twenty-five years ago, more than thirty years ago, and three years ago in ~~Manila~~ Manila, and in Singapore,--I had the old suits reproduced, and I have been wearing them whenever it has been practical since, because of the very simplicity of the garments, and of the ventilation which they give to the body. ,

Dr. Kellogg, in that masterly address, that he gave before an amphitheater full of people at Chautauqua two weeks ago, spoke of clothing as being nasty; and so they are if they are not wash clothing, and if they are arranged so that for a long period of time they imprison the exhalations from the body, the perspirations from the body; and it will be found, for instance, ~~that you~~ if you were to take and distil, put into the distilling pot many suits of clothing, you would find that they would produce a very large amount of uric acid--that poisonous exhalation of the body which is creating so much attention at the present time; and consequently, without any violence to custom, I am merely, whenever the opportunity is suitable, reproducing these delightful costumes that we wore in the tropics, and which are ~~applicable~~ ^{just as} applicable to Battle Creek as they are to Batavia or Singapore. On the other hand, it is a very inexpensive method of

are profitable, that we are accustomed to, and putting them on the credit list, calling them profitable felicities; and putting those things which are unprofitable and calling them unprofitable indulgences,--putting them upon the debit side of the list; and I will repeat what they are. Those that are intrinsically profitable, that always construct and do not react, are not more expensive than they cost, are: air--fresh air, water--pure water, food, sleep; or, rather, in the order of frequency,--air, water, profound sleep, food in the exact amount required by the body; and then those emotions which help to digest food, and to ~~ka~~ make life agreeable and profitable,--love, faith, hope, charity, optimism, and the rest; and then we come down to forethought,--forthought which, like many of the Battle Creek preparations has had eliminated from it the unprofitable elements of cocaine, etc.--we eliminate from forethought feaththought in order that we may remain on the altogether profitable side of the credit list.

After that we place that estimate of measure of all values--appreciation, and recommend the cultivation of it for all it is worth; the cultivation of the appreciation of the smallest of things, in order that we may better appreciate the greater. And when we come to the other side, we may say, of unprofitable indulgences, the black list, as it were, of those things which we are permitted,--tea, coffee, alcohol, tobacco, food in any excess of the optimum requirement, of the minimum requirement; and then those depressing emotions--anger, fear, feaththought, depression--depressions of any sort, pessimism--those must be taboo, because they not only do not give pleasure in reality until we have learned to tolerate them, but they are unprofitable in proportion to the amount taken, and more particularly those depressing passions.

But when I come to that department of vital economics which deals with clothing, I have tried to work out within the limits accorded by conventionality and the law, the simplest form of clothing that will give the best aeration to the

the body, and that would be better accomplished if these garments were porous; but there is a circulation of air underneath and absolute freedom of circulation so that there is very little opportunity for the accumulation of the poisonous ~~xxxxxxxxxxxx~~ exhalations. The moment the clothing is soiled in the way of any impure saturation, it is thrown aside and put into the wash and can be exchanged for an immaculately clean suit inside of a minute. If there happens to be simply a smooch of soot or contact with something that is not dirty, but merely a different kind of material, then we have access to a simple cube of billiard chalk, and the smooch is immediately removed from the garment in this way. The chalk takes off the dust or the dirt with it, or covers it up, and, not being a real impurity, the garment is not condemned on that account; and so it is with the shoes or any of the white garments; and it is equally available and applicable to ladies who wear white shirtwaists as it is to men who wear oriental suits; and in fact, oftentimes, chalk is used to cover up blemishes of character. It is a very useful and available thing and can be bought in the market for something less than a dollar a gross; and I have amused myself in Colorado and in Illinois, and in Chautauqua in distributing cubes of chalk to ladies and children who wore white suits, and they have found it a veritable blessing; and I give it to you without any copyright on the idea, or any profit upon the chalk; but these things are well worth considering.

There have been many forms of what would be called hygienic clothing, but I never yet have seen any but what have all the objections of the ordinary ^{countries} clothing of fashion, except the washable suits. You will find that in the ~~xxxx~~ where the inhabitants habitually wear wash clothing that they are cleanly in every particular. But if you go to a country--and such there are,--where children are sewed up in a single union suit in the beginning of winter and they are not ripped out of it until the spring, think of what happens within those water tight

tight coverings during the six or eight months of the long winter; and those children are not, can not be healthy under those conditions, so that you will see that while I have been called the "chew-chew" man, that it is merely one of the details of vital economics which we are organizing for our comfort and for our economy; because if we were to reduce ourselves to ~~xxx xxxxxxx~~ simples, to dress ourselves in the most becoming manner and not cater to the temptations of Paris, and London, and Berlin in trying to emulate the idle rich in the variety and expensiveness of the costumes, the question of affluence or poverty would be settled in the favor of easy, respectable, cleanly, and hygienic affluence.

In the matter of food alone, it is only necessary to learn the epicurean method of taking food which has been called fletcherizing, simply to let the appetite roam about within a few simple and inexpensive foods, to enjoy the full epicurean delight as the result, to reduce the cost of the food by fully 50%, and to increase the resistance against disease, and to many fold increase the store of available energy by that simple means of learning the requirements of Nature with regard to our economical nutrition and the practice of fletcherizing--from 25 to 30 or 40 ~~xxxxxxxxx~~ minutes a day, for the purpose of securing all of those benefits I have named. It has been estimated, and Dr. Kellogg, who has his fingers upon the pulse of the economics of the country through the various interests that he comes in contact with, will be able to endorse the statement I make--a statement which was published in the Ladies Home Journal nearly two years ago, to the purpose that there were being saved in America every day more than a quarter of a million dollars as a result of this wave of economy which I am preaching and teaching.

You take it in an organization where there is an aggressive and militant effort to conquer the forces of death, the forces of disease, the forces of evil,--

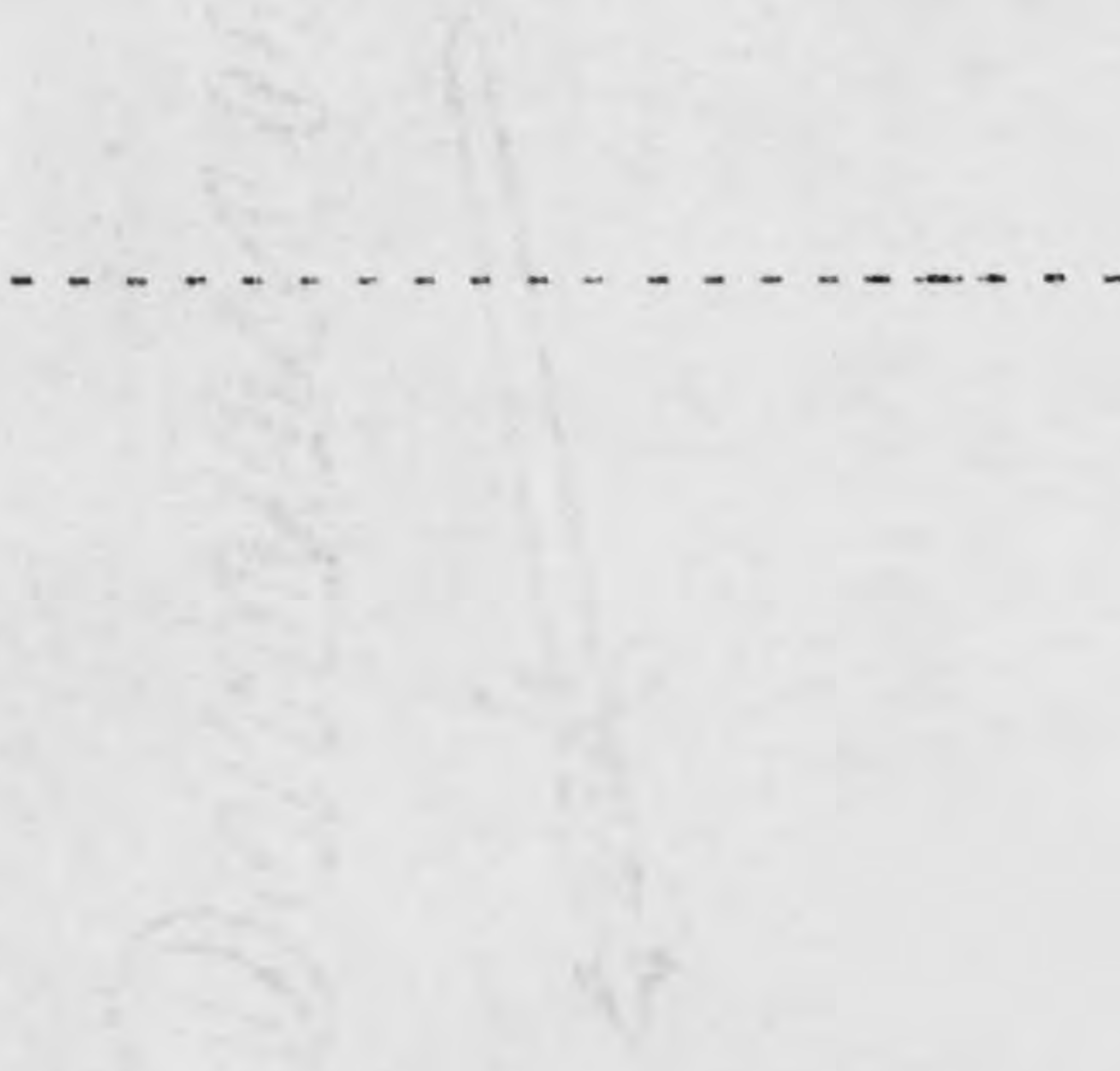
take the Christian Endeavor organization alone, the head and front of the staff of the organization are at the present moment intent upon spreading the information I am giving to you among the four or five million active members of the organization, and among the alumni, or the graduates from the active affairs, whose numbers amount to twelve or fourteen millions of people,--it is not only conceivable, but it is entirely feasible that if the information I am giving to you is spread throughout the Christian Endeavor organization, that an average of ten cents per person may be saved in money every day as the result of that knowledge; but that is the smallest economy and the least of the benefits received, for there is greater immunity from sickness, there is an abundance of Christian altruistic energy available to the members of the organization, and they become really soldiers of the idea, and the ideal of that economy. Think of it,--what it means in the Christian Endeavor ranks alone, I mean in the active ranks alone,--it means between four and five hundred thousand dollars a day. They could build four or five churches; they could build four or five schools every day if throughout the Christian Endeavor organization, and even among the active members who are sworn to devote every energy to their purpose, the information could be disseminated and put into practice,--think of the enormous saving; and when I speak of ~~xxxx~~ the saving it may occur to some persons that in doing that it is a robbing of Peter for the benefit of Paul. That is the case where labor is denied and where money is put in stockings; but every dollar's worth of the natural, the original, natural wealth in the form of food which is saved, is saved to the world; and if there becomes a surplus of it, it simply means the lessening of expense so that the ~~xxxxxx~~ circle of economy to be set up goes on increasing like the waves of a pool, until it is endless in extent; so that, in teaching and preaching vital economics, when I speak of these simple things in every

every-day life, I am telling you of secrets of economy, secrets of health, secrets of efficiency which can be put into practice by every person among us, by children, by grown people, by men and women; and it is for that reason that the Health and Efficiency League suggested at Chautauqua by Dr. Kellogg has been organized; and it is well; and I hope you will all think upon these things because they are of the utmost importance to ourselves. We can immediately begin to draw dividends and to cut coupons, as it were, off of the bonds of economy and the bonds of happiness.

I am not going to lengthen this talk this evening, because I have already talked to you upon the fundamental principles of vital economics, and we have used up the hour which is the ordinary term of the ~~xxxxxxx~~ patience of an audience; but I want to tell you, for instance, and it is not an excuse, nor an apology, but it is an explanation,--that in entering into these competitive sports, you may say, for the purpose of showing any particular ^{feats} ~~prize~~ remaining to me, or that have been recovered by me at this age, it is for the purpose of suggesting perhaps to the million or more of men and women, the two or three millions of men and women who ~~are~~ have already gone past middle age and perhaps have been down and out through indiscretion, through illness, through poor economy, in their habits of life, and who feel that they have done their life's work and are already on the toboggan for the grave,--it is to such that my message is particularly given; it is an encouragement to them to buck up, to change their habits, and to travel upwards and onwards in the paths of usefulness and happiness as I have been doing for the past ten or eleven years, for the past fifteen years; and I may tell those who are sixty years of age that the limit of my improvement, as far as I am able to judge, has not yet arrived. It seems to me that I have been used quite providentially for these purposes of experiment.

It has been entirely without design; it has been in response to what I call the morning thought monitor; it has been entirely opposed to the judgment and advice of friends; it has cost a very large amount of money ~~xxxxxxxxxx~~, a fortune in fact; it has cost an amount of persistence and an amount of ridicule ~~xxxx~~ which would have been discouraging under other circumstances; and I offer it to you simply as the result of a test; and it is just as available to any one of you as it has been to myself; and I may say in this connection that there is in the list of those whom I know who have benefited by these suggestions, even after the sixty years of age, ~~xxxx~~ and a long career of usefulness, there are the best men we have in the history of current biography.

I thank you very much for this supplementary opportunity to have addressed you, and I probably will not have an opportunity again at this time; but I hope soon to return to Battle Creek and to find that this economy, this study of vital economics, which is at the basis of our efficiency and happiness, will have taken root and grown apace while I am away. Thank you very much.
 (Loud applause.)



612.3

D I G E S T I O N

A Stereopticon Lecture at the Sanitarium Gymnasium, Thursday, September 5, 1909, at 8 pm

by

J. H. Kellogg, M. D.

We will talk about digestion tonight. We know where the stomach is. A great many people locate the stomach quite in the wrong place. For example, some time ago a lady said to me, "Oh, Doctor, I have such a pain in my stomach," and she put her hand down there. That is not where the stomach ought to be but in her case that is where it was. Her stomach had gotten out of place. The stomach, you notice, belongs up under the ribs, entirely above the lower border of the ribs.

The stomach is held responsible for a great deal that it ought not to be held responsible for. It is blamed for a great deal that it should not be blamed for. It is a very much abused organ and a long-suffering organ. The fact is the stomach very seldom makes complaint if it is treated well. If one's stomach is finding fault with him, giving pain, distress, and other evidences of annoyance, it is only the remonstrance of the stomach against the abuse to which it is being subjected. The stomach which is well treated will do its work quietly and without complaint. When the stomach complains, it is not properly treated. A person whose stomach is healthy will not know he has a stomach, or know where it is or anything about it.

This is to show the relation of the stomach to the liver. The liver, you see, overlies the stomach a little. The stomach lies almost perpendicular. The main part of the stomach is perpendicular; it does not run crossways as was formerly supposed. Here is the duodenum, or what is sometimes called the second stomach; and notice

at this point the duodenum passes under these blood-vessels. Here are a number of large arteries and veins, and the duodenum passes right under these veins,--this is the aorta,--it passes right under them, between them, and the result is when the stomach is fallen down it compresses the duodenum so that is one cause of obstruction. When the stomach is prolapsed, it drags upon the duodenum at this point where it passes under these vessels, and the result is the duodenum is compressed, and that makes a damming back of the foodstuffs into the stomach, and ~~xxx~~ a retention.

This is the spleen. Now, in cases of intestinal autointoxication, the absorption of large quantities of poisons results in bringing upon the liver an abnormal amount of work, so the liver becomes enlarged, and the gall-bladder, which you see lying beneath the liver here, becomes often enlarged and diseased. Only three or four weeks ago I found a case of that sort in which a young woman had suffered from intestinal autointoxication as a result of wrong diet and ignorance of how the stomach was taking care of it, until the gall-bladder had become infected, germs had gotten into it, and gallstones had formed, so that the gall-bladder was entirely filled with gallstones. Just yesterday I had a similar case,--a lady who had suffered very, very greatly, had great pain in her side for a long time, and finally had come to the point where life was not endurable; so I made a little incision just over this point in the side, and there was the gall-bladder with a large gallstone inside of it which was falling down upon the opening or the outlet acting like a ball valve falling into the opening so there was a constant cramp of the gall-bladder trying to force the bile out of it.

Now, the liver becomes enlarged and the spleen becomes enlarged. A great many people think they are suffering from malarial poisoning who have only autointoxication. When people are suffering from intestinal autointoxication, they will frequently have chills, and often sweating and all the symptoms of malarial infection. For instance, a lady with whom I was talking yesterday in the office, examining her

case, complained of pain here, and she said that last winter, about Christmas time, she had a very severe attack of malarial fever. I said, "How did you know?" She said, "Well, my doctor said it was malarial fever." "Where do you live?" "In Detroit." She thought she had malarial fever at Christmas time at Detroit,--think of it! I said, "Do you have mosquitoes, or stagnant cold water--do you have mosquitoes at Detroit in winter time?" "No, there weren't any mosquitoes, but the doctor said it was malarial fever." Now there wasn't any malarial fever about it. It is absurd to think of malarial fever in Michigan in winter time. We never have such a thing unless it is imported. In this part of Michigan we do not have malaria at any part of the year. Some of you have perhaps already noticed that. This part of Michigan is the highest point in the state. It is on a line drawn from Lake Michigan across the state and strikes a point a little ways east of here, a mile or two, which is the very highest point in the state; so we get the fresh air from the lakes on both sides, both lakes. About 550 feet above the Lake Michigan level, about 600 or 700 feet above sea level, so we have a constant breeze here in the summer-time, and we do not have mosquitoes at any time of the year that produce malarial fever. This lady thought she had malarial fever. I have met I suppose hundreds of such cases, of persons who thought they suffered from malarial fever, who had been taking any quantity of quinine but it didn't cure them, and had been going on day after day, week after week and yet not getting any better. Malaria often runs out after while. Quinine generally stops it alone. At any rate, if you go away from the country where the mosquitoes thrive that inoculate people with malarial fever, you get away from it. The constant absorption of these intestinal poisons loads the system up, and the chill and fever which occur produce enlargement of the liver and the spleen just as does malarial fever; so it acts very much like it. It is this chronic auto-intoxication.

This shows the distribution of the lymphatics of the stomach. This shows the lymphatic arrangement. Here are the glands down here which drain off this part of the stomach. Now, you will perhaps be interested to know what these glands are for. These little glands are the police stations of the body. In these little channels called the lymphatic channels, there travel constantly through the body the wonderful cells, the structures discovered by Metchnikoff, or described by him,--that is, he first described their function, the duty of which is to hunt up germs in the body and destroy them,--these germ fighters which make it possible for us to live in spite of malaria, and which make it possible for us to live for some time in spite of auto-intoxication,--by the way, I told a lady tonight, she was suffering from auto-intoxication, and she said, "Well, I never drank liquor in my life", and yet, she was intoxicated, and I had to explain to her that it was food intoxication she was suffering from, or rather, germ intoxication, because germs live upon the foods. Now then, the germ fighters, the white-cells of the blood travel in these little channels called the lymphatic channels. When one of these little cells has been out here on the outskirts, on the firing line, if you please, and captured some germs, it runs into a lymphatic gland just as fast as it can; it is carried along through the channels, gets into the first gland it comes to; and then some sort of repair takes place; there are other cells there that help to kill off those germs that have been captured and carried in there. That is a kind of lock-up to which the little white cells that arrest the germs carry them. This is the first row, and here is another row behind, and another row behind them; so there are many rows of these glands; so that is the reason why we find children that have tonsillitis have lumps in the throat here. Germs get into the throat, finally into the lymphatic channels, and finally they reach these glands, and the glands become enlarged, swollen up in the throat in the effort of the body to resist the germs. The cells of the glands are filled with cells, so many of the blood-cells they can not swallow them all up. The tonsil is a lym-

phatic gland, and it is in the throat for the purpose of fighting off the germs which abound in the mouth. We have enlarged tonsils because the mouth becomes infected with germs. The tonsil is enlarged when the mouth is infected, and if it is not able to kill the germs by itself, they are carried through the glands further, then these lymphatic glands along the neck swell up, ; and if that is not sufficient, then the glands further down the body become infected, and so the glands of the whole body may in some instances become involved in this way.

Here are the glands which drain this part of the stomach; and here are the glands that drain this part of the stomach. It is very useful to know about this. It is interesting to know the lymph in this part of the stomach travels in this way, and not that way. It is possible to relieve many persons from suffering, very seriously. For instance, a man arrived here last November. When we examined him we found he had cancer right here, which closed up his stomach so that food could not pass out of the stomach into the intestine. When I came to examine him at the operation, and we could look upon it, see it, we found these glands down here were enlarged, and the glands up here were not enlarged. That made it possible to cut his stomach off right here. We cut that stomach off right there, and cut it off over here. The glands all along down here were enlarged also. We cut it off there, and that part of his stomach was taken out entirely. That gentleman arrived here again a couple of weeks ago, came here on purpose to show how well he was--plump, hearty, well--no longer poor, emaciated skeleton as he was when he came last year. I really thought it hardly possible for him to go through the operation he was so thin and poor; but now he is plump, hearty, rosy cheeked, ^{fat} happy and well as he can be, and of course very happy at his deliverance from certain death. He would have been dead and buried some time ago if it had not been possible to perform this operation, which was made possible by the peculiar formation of these glands. If these glands up here were involved, there would be no possibility of relief, because the stomach would have to be cut off here, and that is so close by the tissues above that they would undoubt

undoubtedly be involved more or less so it would not be possible to remove the entire disease.

This study which has been made by Cunio(?) has thrown very great light upon the surgery of the stomach and made it possible to accomplish a great many things that could not be accomplished before. This shows you the different lines of muscle fibers of the stomach, arranged in different layers. Now, you see what a vast number of fibers there are. Here are some that are longitudinal; some are oblique, and some are circular; and these various fibers are contracting and working upon the stomach, forcing the food along, and rolling it round and round, so that it really kneads the food very much as bread is kneaded. In the stomach wall are these little pockets. All along these pockets, are little, individual cells, such as you see here. These cells make pepsin. Hydrochloric acid is also made here in these little pockets and poured out upon the mucous membrane in proper quantity to meet the needs of the body.

Here is one of the glands found in the pyloric region. The pyloric region does not make acid; it makes neither acid nor pepsin, but in the pyloric region, near the outlet of the stomach, there is made a different kind of secretion, similar to that which is made in the duodenum,--an alkaline secretion; so we know that these two parts of the stomach have a different function. More recently it has been discovered that these two parts of the stomach, the pyloric portion of the stomach, and the cardiac portion of the stomach, are really two different organs which are closely associated but have entirely different functions. This part of the stomach makes the acid gastric juice which dissolves the food. This part of the stomach, the pyloric stomach, makes alkaline secretion, an entirely different secretion, different in character, and more similar to the pancreatic juice. The fluid formed here in the pyloric stomach is very similar to the pancreatic juice.

Now, I have shown you this picture to explain something which is very inter-

esting respecting the function of the stomach as regards motility, that is, its action upon the food, its mechanical action upon the food. When the stomach is at rest, these walls collapse. It is not a great cavity, an aching void longing to be filled--a small boy feels that way with his great appetite; but it is not so. The normal stomach is collapsed. It is shut up like an empty bag. It is not only shut up, but it is also collapsed, its walls are not distended; it is collapsed like an elastic rubber bag. Blow it up and it becomes distended; let the gas out and it collapses. That is exactly what the stomach does. It does not collapse so much as the balloon does because it has a thick wall; but it expands and contracts according to the contents which it contains. So, when one finds the stomach does not collapse, when it is empty, that is an evidence of disease; that is the first stage of diminished motility. That is due to a weakened condition of the gastric walls, and it is a condition which is the first beginning of a worse condition of enlargement. It is what is called lack of motility. It is a latent dilatation of the stomach. Now, for instance, if this stomach was of this size when it was filled, it ought to be of about this size when it was not filled,--not more than one third as large as it is now. If it remained this size when it was emptied, then it had lost its power to contract. Such a stomach has lost its elasticity, its contractility, rather, and pretty soon it will be dilated more and more until by and by it ^{would} ~~ought to~~ be very much dilated, perhaps, and a sack will exist in it which is not an uncommon thing. The food is in the shape of a ball in this part of the stomach, and this ball is rolled round and round, and the gastric juice comes in contact with the outside of it, dissolves it, reduces it to liquid, and the liquid portion comes along, passes into the pyloric stomach, and the pyloric stomach is closed during digestion; the muscles contract so that this side and this side are in contact, so the contents of this part of the stomach are shut in from the contents of this part of the stomach, and only the liquid part of the food is allowed to pass through into the pyloric stomach. It is squeezed through, forced

through by the contractions at this end, simply forced through the opening here at this end of the stomach, forced through the opening here into this portion of the stomach; then this part of the stomach here acts like a syringe and forces the contents on into the small intestine, the duodenum, and the work of intestinal digestion begins.

Suppose it happens that the contents of the stomach are very acid. Then when they pass out of the intestine into the duodenum, the duodenum causes the pyloric muscle here to contract with so much vigor that it does not open properly; so when the pyloric stomach contracts, instead of opening, as is the custom normally, it remains closed; then as the pyloric stomach contracts the food can not pass on out, and it shoots back again and is sent back with so much force that it rises up through the esophagus, comes up in the throat, and that is what makes the raising of gas and of acid liquid in the mouth with persons who have acid dyspepsia, persons who say, "I can not digest starch because it gives me gas and acid in my stomach--acid and gas. The reason for that is that a person who has too much acid in the stomach,--when too much acid is formed here, the presence of so great a quantity of acid prevents the action of the saliva upon the starch, so the starch digestion does not take place, and the food can not be liquefied, but remains in the stomach for too long a time. It remains so long a time that the stomach is excessively irritated, and the contents become extremely acid; then these muscles contract with excessive vigor, the outlet is closed, and the strong contractions force a portion of the gas which the stomach normally contains and which ought to be sent along down the intestine--that gas is sent up through the mouth instead of being passed along; and the contents of the stomach, instead of going down into the intestine altogether, as they should, are, of course, sent back through the mouth.

The most remarkable experiments and discoveries that have been made in recent times have been made by Pawlow, of St. Petersburg. Pawlow, at St. Petersburg is undoubtedly the greatest physiologist in the world living today. One of the great

things which he has achieved is the formation of an experimental stomach in the dog. He has discovered a method by which it is possible to reconstruct the dog's stomach so as to make a second small stomach entirely separate from the other, large, stomach, and communicating with the outside of the body. Then he puts foods of various kinds into the stomach, lets the dog eat it in the usual way, then watches to see what happens. When food is put into the stomach, gastric juice is formed here in the stomach, mixed with the food, but at the same time, gastric juice pours out into this stomach just the same as in that one; so this gastric juice formed in this little stomach can be measured, and can be studied carefully, can be thoroughly investigated, and some interesting things have been found out. It has been found out, for example, that there are certain foods which cause the stomach to make a great deal more gastric juice than normally, that excite a great deal of gastric juice; and there are some foods that make a very acid gastric juice. There are some foods which promote the formation of pepsin and do not promote the formation of acids. There are foods which prevent the formation of acid and pepsin as well as foods which encourage it. Now, it is very useful for everybody to know the particular things I am just mentioning now. It is of the highest value to know, as it enables us to regulate the dietary according to the condition of the stomach. For instance, here is the stomach. Suppose there is too much acid formed in that stomach. What causes that stomach to form this habit of making too much acid? Pawlow has demonstrated the cause of it, and gives the reason why; he has shown us why. Pawlow has shown that when you give a dog meat by the stomach, the little stomach pours out a large quantity of extremely acid gastric juice, whereas if you give the dog bread, then the little stomach pours out a small amount of gastric juice, which is very mildly acid, which has very little acidity but has a great amount of pepsin, very, very powerful in its effect upon digestion, and very powerful gastric juice but not much acid in it. Now, why is that? That is one of the most wonderful provisions of ~~the~~ ~~body~~ Nature to protect the body.

The acid of the gastric juice is one of the most powerful disinfectants known; it is a very powerful disinfectant--the acid of the gastric juice. It is called hydrochloric acid, and hydrochloric acid is capable of destroying every germ that is known; and this hydrochloric acid is formed in the stomach in proportions sufficient to destroy germs, and all kinds of germs are destroyed by the gastric juice which is formed in the stomach when in normal condition.

Now, meat contains a great quantity of germs. Meat is highly infected with germs. A small morsel of meat such as you would ordinarily put into your mouth contains more than a billion germs. You say, "Oh, but I only eat good meat." The best meat you can buy in the market is infected to that extent; and when meat has become a little old, has been kept too long, it contains ten times as many. This is a thing that has been strangely overlooked. I was reading in one of the popular magazines, a recent number of McClure's, an article by a certain Dr. Woods Hutchinson upon the subject of diet, and he talked about poison foods, and he tells about the awful poisons in beans, the terrible poisons in peas, and those dreadful poisons in nuts, and about the great and terrible poisons that are found in lentils,--these simple foods on which millions of people have been living for centuries, for many thousands of years. He warns us against these awful poisons, then he tells us that meat is one of the few non-poisonous foods, that it is less likely to contain poisons than almost any others. His article is very interesting, and is a most extraordinary production. He is a very charming writer and one can almost forgive him for his awful heresies because he writes in such a charming way; but, nevertheless, I think it is the duty of any public teacher to call attention to the dreadful errors which he is advocating, and propagating. And one of these certainly is the idea that meat is the least likely to contain poisons.

Now, it is true that beans contain a small amount of poisons, but these poisons are uric acid, and uric acid is not such a very poisonous substance. It takes a

large amount of uric acid to make a person very sick. If it were not for that fact, the most of you would not be here, because the most of you have been eating uric acid in great quantities. Every pound of meat contains fourteen grains of uric acid--think of it! There is a gram of uric acid in every pound of meat, and a pound of sweetbreads contains seventy grains of uric acid. Seventy grains of uric acid--just think of that! seventy grains. Why that is more than a dram--more than a dram of uric acid is found in a pound of sweet breads. All kinds of meats contain it--all sorts of meats. Veal contains a great quantity of uric acid. Now, suppose a man eats a pound of meat a day for a year, how much uric acid would he consume? Just think of it! Three hundred pounds of meat contain 300 times 14. That would be not less than 4200 grains of uric acid, or more than half a pound of uric acid. A man who eats meat freely eats more than half a pound of uric acid every year of his life. Think of it. Uric acid is a very bad poison. Now beans contain a little uric acid, just a little of it--four grains in a pound of dried beans. Meat is three quarters water, you know. Now, we add to the beans three quarters water, and you find a pound of beans, put on the same basis as a pound of meat, would contain only one grain of uric acid to the pound of beans in the form in which they are eaten on the table. That is one grain compared with fourteen grains. Then, you see, meat contains fourteen times as much uric acid as do beans--fourteen times as much. But there is something more about that. Beans when they are cooked, are very often parboiled. The majority of housewives, I think, parboil the beans--soak the beans in the first place in cold water, which soaks out some of the uric acid; and then they boil the beans for half an hour and turn the water off, and when they do that, the uric acid all goes off in solution in the water. Uric acid is very soluble in hot water. It is not very soluble in cold water, but it is very soluble in hot water, so when the beans have been parboiled and the water poured off, there is no uric acid left there at all. Now, how is it about meat? On the other hand, when the meat is cooked, all the uric acid is left in it; it has the same poison in it that dry beans have, as beans have uric acid in them, which

Woods Hutchinson tells us makes them so bad they are not fit to be eaten because they have got so much uric acid; and here is meat, has fourteen times as much, yet he says that meat is not a thing to be afraid of at all, that it is less likely to contain poisons. But, more than that, uric acid is not the bad poison that meat contains. The bad poison of meat is due to the fact that meat contains in countless millions one of the most deadly germs known; that is, the *Bacillus aerogenes capsulatus*. That is one of the most deadly of all germs known. A man was passing by a lion's cage in a menagerie the other day, and he put his arm inside to wake up the lion that was sleeping. The lion was an old friend of his that he had formerly owned, and he thought the lion would recognize him; so he touched him, awakened him, but the lion when he awakened did not recognize him, and seized his arm, put his teeth deep into it, lacerated the muscles very badly. The man was taken to the hospital and in fourteen days he was dead; and when an examination was made, it was found that his entire body was filled with this germ I have told you about--the *Bacillus aerogenes capsulatus*. He got it infected from the lion's mouth. The lion, eating meat, had got it from the meat and then communicated it to the man. That is the reason why the dog's bite or the cat's bite is often so very dangerous, and why it is so likely to communicate infection, and that is why the bite of a rat will often do the same thing; why the bite of a carnivorous animal is always dangerous--because the mouth, the saliva of such an animal always contains them in countless numbers so that they are carried into the tissues, and inoculation takes place. So, meat always contains quantities of germs, and that is the reason this large amount of hydrochloric acid is poured out in the stomach with meat. It is a protection, to disinfect the meat.

Now, if the white of egg is given, it has no such effect at all. The white of egg is a protein, like meat, but does not call forth a large production of hydrochloric acid in the stomach, and the reason is, it is not infected. These infectious substances present in the meat are found to be the cause of this hydrochloric acid

being poured out. Now, an experiment has been made which consisted in taking the meat and extracting all these poisons out of it--the poisons formed by the germs. The meat is thoroughly soaked, washed, laundered thoroughly until all the poisons produced by these germs have been washed out of it; then the meat does not cause the development of this large quantity of hydrochloric acid, which shows that the hydrochloric acid is in part at least protective. It also is a digestive agent, and meat always stimulates the outflow of this acid. On the other hand, bread and cereals have the effect to stimulate the formation of pepsin. Milk has the effect to produce gastric juice which is very feeble. Cream, fat in all forms, hinders to a very high degree the formation of gastric acid. Now, that is the reason why the lumber man of the north woods is very fond of fat pork. He says it sticks by the ribs. That is exactly what it does. It stays up here under the ribs, under the chest wall, so he does not get hungry very soon. He calls it a hearty food. These so-called hearty foods are all of them hard-to-digest foods, and that should be the proper name for them. Hearty is simply an abbreviation of hard-to-digest. That is the short of it.

I had this slide of Pawlow made from a photograph which Prof. Pawlow gave me himself; and I had the pleasure to receive a few days ago from him a very nice note, and a picture of his wife and children. They are all very charming people. Here is the picture of another great man--Prof. Robert Koch, the man who discovered that consumption is produced by germs, discovered the tubercle bacillus; and his researches have laid the foundation of this science of bacteriology which throws such an enormous flood of light upon the causes of disease. We would hardly know how to practice medicine at the present time without the germ theory. To Prof. Koch more than to any other man, ~~xxxx~~ dead or alive, is due this wonderful development. Right along beside him, however, ought to be put that marvelous man, one of the greatest geniuses that has lived in our modern times, ~~Rxax~~ Pasteur, the founder of the Pasteur Institute, of Paris--an institute erected by the French government as a monument to the genius of this man,--as his grave stones, and a monument erected to his memory are

in the same inclosure with the Pasteur Institute a picture of which I will show you right here. This is the Institute as it stands today. I had the pleasure of visiting the Institute only just a few weeks ago, and climbed up this flight of stairs you see here into this door upstairs here, to a door a little ways down which is the room of Prof. Metchnikoff, where wonderful discoveries have been made in the work of the white cells of the blood. I had the pleasure of knowing Pasteur. I made his acquaintance about twenty years ago, and I certainly greatly admired not only his genius but his character. He was not a large man, was a man about my size, I think, perhaps really not quite as tall as I am. Prof. Metchnikoff, whose picture I will show you next, is his present successor; and he is in the Pasteur Institute today what Prof. Pasteur was when he was there; only his reputation is not so great in Bacteriology, because he has not made so great discoveries; but he has made discoveries in biology, with reference to the white cells of the blood whose function is to fight off germs. He is the man who discovered that these white cells have the power to capture germs, to swallow them, eat them up; and it is one of the most interesting things we have learned in these modern, most interesting times.

Now, just a word about these germs. I have introduced these workers among germs for the purpose of introducing the germs themselves; and this is now the short story I am going to tell you of the germs of the stomach and intestine which you hear so much about nowadays--autointoxication so many of you ask about. You say, "What is that? I don't drink liquor. What do you mean by saying I am intoxicated?" There are intoxicants that are far more intoxicative than alcohol. Some of you know that. Whiskey is worse than beer to intoxicate a man. Wine is more intoxicating than beer; and brandy is more intoxicating than wine; absinthe is more intoxicating than whiskey or brandy, and bad whiskey containing fusil oil is still worse; but there are drugs that are far more intoxicating than any of those. Opium is more intoxicating than brandy, whiskey, absinthe, or fusil oil. Chloroform is still more intoxicating. Cocain is a more deadly intoxicant still; so there are different degrees of intoxicants.

Now, the poisons which are formed by these germs, by the germs which are found in the intestine, are still more intoxicating. ~~These~~ Germ poisons are among the most deadly known. Down in South America, you know how they fight down there--how they kill a man--those savages? They dip their arrows in decomposing blood; and when the arrows have been dipped in this decomposing blood they are extremely deadly. If they strike a man, enter the skin, they introduce some of that virus into the circulation and that man is sure to die of blood-poisoning, almost absolutely certain to die. So we know these poisons are extremely deadly. Medical students sometimes in making their anatomical studies in the dissecting room, happen to have a little bit of a cut in the skin, and the result is perhaps that an arm must be cut off. A butcher, whose occupation leads him to a dissecting room habitually, and who is all the time dissecting and engaged in post-mortem examinations--the butcher happens sometimes to cut his own flesh with the same knife with which he has been cutting the flesh of a dead ox or a dead sheep or pig. Not infrequently blood-poisoning occurs, and an arm, a finger, or a limb must be amputated; and not infrequently the butcher loses his life because of the infection which occurs from these germs and germ poisons.

Now, these very germs which are growing in the meat there, which inoculate the butcher and which cost his life, producing blood-poisoning,--these same germs are swallowed with the meat, and ordinary cooking does not destroy these germs; baking in an oven does not destroy them. They must be heated at a temperature of 240° at least for half an hour, in order to kill these deadly germs. The baking temperature is only about 160°. Steak that has been ordinarily broiled has scarcely been disinfected at all. The inside of the steak has been made only just about warm enough to wake up all the sleeping germs and make them good and lively. It is only the outside of the beefsteak that is in the smallest degree disinfected by the cooking. So the beefsteak is swallowed with all these germs which grow and produce poisons and

and putrefaction. That is why the stools are putrid of the dog, or of the man or woman who eats meat. They have the stinking character of meat, decomposing flesh, because that is what constitutes them mostly; they are largely composed of rotting flesh. They have the characters of rotting flesh, and they are absorbed and retained in the colon sometimes for days, sometimes for weeks even--these decomposing masses are pouring into the blood continually quantities of germ poisons and impurities of germs. The germs are carried into the intestine and are absorbed into the blood and circulate through the body. I will tell you more about that a moment later. Just a few words now on facts which have been disregarded in recent times.

The studies of the bowel discharges of an infant show that they contain absolutely no germs at all until the child is ten hours old. Then just a few germs begin to appear. That child was not more than ten hours old. So long as the child subsists on mother's milk there is only one kind of germ found mostly, and this is a germ which forms acids. That is why the fecal discharges of an infant have a sour odor, but not a putrid odor. Those discharges may be placed in a bottle and put away and remain in that same condition for months and months. They will never rot, putrefy, or acquire a stinking character, because it contains these germs which are protective germs, germs which form acids which ~~xxx~~ keep away, hold at bay and prevent the development and growth of germs of putrefaction. Germs of putrefaction produce alkalis. These germ poisons are alkaline substances and the germs themselves grow only in an alkaline medium.

Now, when the child begins to eat cow's milk, a different thing occurs. Here you see they are all blue. They are a peculiar kind of germs which when stained with a certain staining matter take on that blue color. Here is another kind of germs, red ones, and they are the so-called colon germs. Here is another kind of blue germs which are germs of putrefaction from cow's milk. Here is a slide from a person who was living upon a mixed diet with meat, you see, and there is still another kind of germs comes in--these large, long ones; and these large, long ones are the

poison-forming germs. They are the deadly germs; they are the germs which cause rheumatism, which cause putrefaction. The *Bacillus aerogenes capsulatus* looks very much like that germ, and I think very likely that is that very germ, the germ I was telling you about a little while ago. In a healthy person these germs are not so very numerous. A person whose body is strong, well, and vigorous, is able to keep down the growth of these germs even though he does eat meat, and for a long time he can tolerate it and go on year after year thinking he is all right because his body is strong enough to keep these germs at bay; so you do not see very many of those large ones.

Now, I am going to show you next the things we find here in our examinations in our laboratory. These are what we are finding every day in our laboratory. We have a microphotographic department in which we can make these examinations. This is the way we find them--these enormous numbers of poison-forming bacteria which produce the deadly results I have been telling you about. Here is one in which the patient is getting better. You see those large ones have disappeared, and we now find only the smaller ones; it is getting back into nearly the normal state again, you see, and this shows the improvement that is taking place.

This shows the colon in its normal condition. At these two corners, the hepatic flexure and the splenic flexure, it is fixed. The rest of the colon is quite movable. It is fixed here. This portion in here is fixed; this part is free, and this portion is fixed here to some extent, and this portion is quite free. Now, when the colon is in this condition and its functions are normal, the foodstuffs remain in this part of the intestine about fourteen hours. At the end of fourteen hours, it begins to turn the corner and passes on, and it completes the transit of the alimentary canal in about three hours more. It is seven hours from the stomach to the cecum, fourteen hours in this little short portion of the bowel; seven hours passing through the twenty-five feet of small intestine that brings it down to the colon;

~~xxxxxx~~ fourteen hours occupied in passing through one foot, just going one foot in the large intestine here, then three hours in going through the other four feet of the large intestine. Please notice here where the small intestine has been joined onto the large intestine on the opposite side here. Sometimes foodstuffs remain too long here, can not pass out; sometimes obstruction occurs here and there gets to be an enormous dilatation, so the food gets down here and can not get out. In those cases it is possible to relieve the situation by joining the small intestine on over here so the food comes down toward the stomach and empties in here instead of coming over and having to make that circuit there; it makes a short cut and empties right there at once; so it cuts out the fourteen hours in the cecum and the three hours in this part and goes directly at once into the lower part of the large bowel. I had the pleasure of hearing a short time ago from a lady upon whom I performed this operation something like a year ago, and she is now in perfect health. When she came here she was yellow as saffron; her skin was the color of certain kinds of leather; she was very much emaciated, and told me her bowels had never moved once normally in her lifetime. I performed this operation; the bowels moved three times the next day, and have been moving normally ever since.

This shows you what happens to disturb the bowels, and why some people suffer so much from inactivity of the bowels. The central portion of this bowel is prolapsed; the transverse colon has become elongated; ~~the~~ the bowel, from overdistension by gas and other causes becomes too long, and there is not room for it to lie in the proper position; so it sags down here like this. So, after the food has remained fourteen hours in the cecum it passes around here, gets over here into a catch basin and stays there for fourteen hours or fourteen days; it just remains there a long, long time—hours, days, weeks sometimes before it can get up to the splenic flexure and get around into the descending colon; and the result is, of course, great inactivity. Now, this shows a case of that kind. We have means now by

which we can locate the colon exactly, by percussion, or by inflating with gas, by means of the X ray and in other ways. This is a case observed by a physician in Dresden, Germany, a Dr. Minert, and this was a photograph sent to me some twelve or thirteen years ago by Dr. Minert, of Dresden. I had a very pleasant visit with him a few weeks ago, and I found him an extremely amiable and scientific man. He located the colon upon this patient, marked it out with tincture of iodine, and took the photograph.

Here is another case in which the stomach was enormously enlarged, clear down to this point. Dr. Minert observed these cases years ago before most other physicians had gotten an understanding of the subject, and he published a very interesting article on the subject. He was making some observations, and made some similar to this one. I had a case of this kind yesterday. In the operating room I found a case exactly like this, in which the cecum came clear over to the left side. If we cut that off there it would be about normal; but you see here is this enormous pouch that is added. You can see it is utterly impossible for it to be otherwise. The food, entering this large pouch, simply remained there, and the only way in the world such a thing can be emptied out is by putting the patient up on an inclined plane with the hips up and the head down here, then making massage and pressure over the colon. Some of you have had that for your prescription. Colon massage is administered to you in that way, and we also have sometimes patients lie on this inclined plane with a compress placed over the colon, so that each time the patient takes a breath, the compression of the diaphragm on one side, below, and the heavy compress above compresses the cecum between the compress and the diaphragm, and so crowds down its contents.

Here is another specimen of this dilated cecum, and the transverse colon also prolapsed, you see. Here is dilatation of the sigmoid flexure. When food reaches those places it remains for a ~~short~~ ~~time~~ long time and does not undergo

the proper movements of peristalsis which carry it along in the alimentary canal.

Now, I was going to tell you some more things; but next time I will tell you something further about the digestion of foods.

This shows the effect of fasting upon germs of the intestine, and that is the subject I am going to speak about next time--the advantages, disadvantages, benefits, and the evils and dangers of fasting; then the dangers of a ~~fast~~ of various kinds, and their digestibility.

I want to tell you something about a diet prescription. Ask your doctor for a diet prescription. He will make one out for you. Here is the blank you will find in your books by means of which you can keep a record of the number of calories. You will find it profitable to keep the record of each day, sum it up, get the total for the day, then the total for the week, and to get the average for each day and for the week; then you can by comparison with the table, see whether you have any right to expect to be gaining or not. A patient says, "Oh, I am not gaining an ounce; I have lost a pound." Perhaps the trouble is you have not eaten enough. How do you know whether you have eaten enough or not? The only way is to keep track of it. Keep this day book of your income. And if you will weigh yourself day by day, you will have a note of your outgo. You can keep track of the income and the outgo. When you weigh yourself, you find what is left of you after you have gone on working and burning and exercising and getting your baths--your weight every day will tell you just where you stand. You will find it worth while to keep track of your weight and your calories. By looking at the table in the little yellow book the Sanitarium Diet List, you will find there how many calories you ought to eat. If you are not eating as many calories as are required by that table, you may be certain you will not gain in flesh. Suppose the table says you ought to eat 1500 calories when you are eating only 1200 calories; you will have to lose. If you are going about, exercising, you will certainly lose

tainly lose--can not help but lose, because you are burning up faster than you are supplying fuel.

Suppose you are trying to lose flesh, and the number of calories you should use for a person of your height--not of your weight, remember, but of your height, is 1800 and you find you are eating 2000. You can not lose; you will certainly gain. You will keep right on gaining. If you expect to lose, you must take less than 1800. Eat 1400, or 1200, or a thousand, or even less; then you are going to lose, because the income will be less than the outgo. So it is worth while to keep track of this.

Here is a list of thirteen dietetic suggestions. I wish you would read every one of these, and next time I am going to take up each one of these and we will read them over and consider them, and consider the reason why, and that I think you will find of some practical interest.

575.7

Teeth Personnel as well as public hygiene

Improving the Race by scientific feeding
Conservation of Health.

TALK TO DOMESTIC SCIENCE CLASS.

At the Class Room, Sanitarium, Battle Creek, Mich., Tuesday, September 21,

1909 at 2:30 P. M. by

J. H. Kellogg, M. D.

This looks like a very fine class though not a very large one. I trust they make up in quality what they lack in quantity. The class probably will be reinforced somewhat before the year is over. I suppose some of you who are new, who have recently come to the institution, are perhaps wondering what is the raison d'etre of the Battle Creek Sanitarium Training School for Health and Home Economics. This School of Health and Home Economics is the outgrowth of the general work of the institution. The institution itself is a protest against modern ways of living. The fact that the human race is degenerating rapidly, that the stamina of the civilized race is being very rapidly exhausted is evident; that the human race under civilized conditions has undertaken to subject itself to too many artificial conditions of life; that the environment has become unnatural.

Now it has been recognized for many, many years by scientists in the study of animals of various classes, that when an animal departs from its natural conditions, when the natural environment to which the animal is accustomed and naturally adapted becomes modified in such a way as to become artificial and unnatural to the animal, the result is degeneracy. If the environment has been abnormal and becomes more favorable, then there is an improvement in the race, in the species; but if it is the reverse, if the animal has been living in a state of high development under favorable conditions, and then condi-

tions become unfavorable, the result is always degeneracy; and the thing that has been noticed is that this degeneracy affects the hard parts of the animal first. It first makes its appearance in the bony structures, probably because the bony structures are, in a certain sense, the foundation of the animal, the framework by which the other structures are carried.

Now, this is noticeable in the human race. You have doubtless all of you known more or less about the Mound Builders. These mound builders, who belonged to a race the history of which is now buried in the unrecorded past, left mounds scattered all over this country by way of testimony to the fact that there was once a race that was numerous and powerful who lived in this same climate where we now live, subjected to the same climatic conditions, under the same influences of soil and water as we are at the present time, and that this race was a powerful race, that they were more powerful than the race that now occupies the land, as evidenced by the development of the skeletons which are found buried; and one of the special features of these skeletons is the large, massive jaws of the people who lived here at that time, and the wisdom teeth are fully developed and permanent in the jaw.

Now, I would like to ask a question--how many of the persons present have thirty-two sound teeth--of course I don't mean store teeth that were purchased somewhere, but teeth that were grown in your own mouths, a crop of your own raising,--how many have thirty-two sound teeth in their possession? Are there any? Not a single one. I asked that question down at Chautauqua the other day at an audience of about two thousand people, perhaps three thousand people, and only six persons raised their hands. And I begged them to stand up on their feet so that the audience could see them, because they were such remarkable people. It is a most unusual thing to find an adult person

with thirty-two sound teeth. The wisdom teeth generally make us a great deal of trouble in coming through because there is not room for them in the jaw; the jaw is too short for them. The lower jaw is getting shorter because the wisdom tooth is perishing; so there is no real necessity for growing a jaw to support a tooth that is coming out in a short time. Perhaps some of you may not be aware that if a tooth is pulled anywhere in the jaw, the jaw shrinks, accommodates itself to the new conditions; it changes shape. If a tooth is drawn on the side of the jaw, the jaw on that side will shorten, and that changes the expression of the face. When all the teeth are drawn, you know the effect it has upon a person; you sometimes see such a person, and you know how very greatly the expression of the face changes in elderly persons. The expression of the face changes by shortening of the jaw due to the perishing of the wisdom teeth. It is simply the beginning of the end of the civilized races. This destruction of the hard parts is an evidence that the race is decaying.

Now, these mound builders had splendid teeth because they used them, and because they feed upon natural foodstuffs. They raised corn. Corn is an American product, as you know, an American plant. They raised corn and subsisted chiefly upon corn. The principal food of these mound builders was corn which was first hulled by soaking in water, then parched, then ground in a hollow stump which had been burned, then scraped out, and then burned again, charred, and scraped out until it was hollow--a hard wood stump; then the corn was beaten upon the hollow top of the stump with a wooden pestle until the hulls were rubbed off; then this corn was ground with a stone mill, the kernels were rubbed until they were ground and dried, and then carried in a little skin bag wherever they went, and mixed with a little water to be eaten; and that was their food; that was their principal food. The ground corn cooked, then ground up and dried, mixed with water, formed the principal source of sustenance; and the chew-

ing of the corn and of the nuts and berries upon which they fed gave plenty of use for their teeth so they were strong, hardy, and well.

But now we see here a foreign race which has come in and occupied the same territory, who ought, under the same conditions, to be just as strong, just as hardy and well, and equally well developed; but instead we find a race that is perishing; and what is true of the American races is true of other races.

Now, as an evidence of this,--I have been preaching this doctrine for thirty years now,--I think it is some thirty-five years since I began to call attention to the fact that the American race was perishing; and I was satisfied of this by the increase of insanity, the increase of deaf and dumb varieties of the human race, and by the increased number of persons who have narrow chests; the increase of consumption, the increase of chronic maladies in general, and the decrease of aged persons. I could not get all the statistics at that time to prove it, but I was satisfied it was true, and must be true, from conditions which existed; but at the present time we have the proof. The Massachusetts Life Insurance Association, a general association in which all the different life insurance company join hands, has been gathering up statistics and studying them very carefully. It is very important they should do this, because they have to pay for lives when their patrons die, when their policy holders die, then they must pay; and the longer they can keep them alive, the more profitable it will be for them; so it was important they should investigate the question. When they sell policies, they say to a man, "Wek will charge you so much for a policy." They have to make a very careful calculation as to what it is going to cost them on the average. They must be able to get back for the money which is put into their hands,--to invest it so as to get back and earn enough money to be able to pay the face of a policy to a man's family when he dies, and to have a little profit left. The life insurance companies

have been getting worried the last few years because they have found their profits are diminishing; the number of deaths have not come out as they calculated. The policy holders were not living as long as they were expected to live; so they have been making an investigation of the matter, and they have found out that the expectancy of life is notably diminishing. Comparing the statistics of 1865 with those of 1895, they discovered that in this period there was a great increase in the expectancy of life--that is, the number of years the average person would live, in young persons, below forty; but there was a decrease after forty. Taking the number of persons dying at different ages in 100,000, in the first place they found that the mortality of infants between one and five years has diminished thirty-five percent; that is, one third more infants live now than lived thirty years ago,--infants between one and five years. Between five and twenty years, the number that died is 40% less than it was. The mortality has diminished 40% between ten and twenty years. Between ten and thirty years, it has diminished less. Between forty and fifty years, the mortality has increased eight per cent; between fifty and sixty, it has increased 17%; between sixty and seventy years, the mortality has increased 18%, and it has increased all the way along.

Now, it might be considered this was due to some local cause were it not for the fact that the same thing is taking place in other countries. In England the same increase in mortality is observed after sixty years, and I recently obtained statistics from Italy, and I find there the same thing is true, only it is a great deal worse. In Italy the mortality after sixty years has increased more than 300%. The mortality is more than three times as great after sixty years. In other words, a man sixty years of age has only one third as long to live in Italy today as he had fifty years ago. This increase has been,

within fifty years, between 1856 and ~~1896~~ 1906; so the comparison with the statistics of Italy show this is a world wide thing that is taking place--the increase in the mortality of persons forty years of age or more.

Now, below forty years of age, improved sanitation has kept the race alive, is keeping a large number alive. The increased knowledge of how to care for infants, how to feed babies, the impurities of milk, the germs found in milk and other causes of infant mortality, which were really the dominant causes,--this knowledge has made it possible to keep a vast number of babies alive who formerly died. Now, there is a thing to be considered about that. Formerly thousands of babies died because of the use of bad milk; all the weakly babies died. The tough and hardy babies were able to live through in spite of these influences to which they were exposed; so this was a method by which that great law which the scientists have discovered in modern times--the law known as the survival of the fittest,--the survival of the fittest has been set aside, has been set at naught, so this law was no longer in operation; and the unfittest have been living along with the fittest; the feeble and the weak and the infants predisposed to disease have been kept alive by this better hygiene; so the effect would be naturally to diminish the stamina of the race. Now, more than thirty years ago I prophesied that this thing would occur. I was a member of the state board of health at that time, and used frequently to lecture about the state at sanitary conventions, and I always took pains to announce this idea--that our improved attention to hygiene, public hygiene, keeping off the plague and the black death, and the cholera, and yellow fever, and things of that kind, and controlling typhoid fever was going to keep alive a whole lot of feeble people, and the result would be to destroy the race unless something else were done; and that something else that needed to be done was this; these feeble

people that were kept alive must be taught how to live so as to develop good, strong constitutions; that their predispositions must be obliterated by right attention to the habits of life, to health, health-producing habits; that constitutions which they lacked at birth must be built up for them; and that this might be accomplished by returning to natural ways of life, ~~but~~ by learning how to eat, by learning what to eat; by spending more time in the sunshine and the fresh ~~and~~ air, and outdoors, by attending to all the things that make for health; in other words, that we must attend to personal hygiene, and private hygiene, as well as public hygiene; otherwise the public hygiene would result, instead of preserving life, ultimately in the extinction of the race by preserving alive the feeble individuals and through them contaminating the whole race.

Well, we find recent statistics have shown it is working out exactly that way. I knew it would work ~~the~~ out that way, had to work out that way, because there was a great law in operation here which must result in evil consequences unless some other law was brought in as an antidote.

The thing I want to call attention to especially here is the importance of the home and of the housekeeper and the manager of the home in relation to this problem. It is only through the education of women and the reformation in the home that this influence which is operating to destroy the race can be overcome. There is a great tidal wave of degeneracy that is existing over the whole civilized world that will with absolute certainty lead the race to extinction, and is carrying it rapidly down the hill of race deterioration and destruction at the very present time. Chronic diseases are increasing enormously. The leading chronic diseases have increased in the last fifty years to an enormous extent. They have increased in the last seven years, between the years 1900 and 1907,--these chronic diseases such as apoplexy, arteriosclerosis,

cancer, Bright's disease, and other dreadful maladies have increased at such a rate that if they keep right on increasing at the same rate, the mortality will be doubled within from twelve to forty years. The ones that increase the least rapidly will double the rate of mortality in forty years. Diabetes is a disease that is gaining ground so rapidly that in twelve years, no, in five years twice as many people will be dying, more than twice as many people will be dying of diabetes as were dying from it in the year 1900. Now, just see what that means. Insanity is increasing at an enormous rate. It has increased 300% in fifty years. If insanity continues to increase at that rate, it won't be very long before it will be difficult to find anybody that is sane. At the present time there are 3400 lunatics and idiots in every million people. Just think of it. Here is a city with a million population, and in that city there are 3400 lunatics and idiots--enough to make a whole town. Fifty years ago there were only one third as many,--only 1100 fifty years ago. Now suppose we increase at the same rate, in another fifty years it would be three times as many as now, and that would be ten thousand lunatics and idiots out of every million; so in fifty years more it will be 1% of the total population, and every 100th person would be either a lunatic or an idiot. In fifty years more it would be 3%; in fifty years more 9%; in fifty more years 27%; in another fifty years 81%, and in another fifty years it would be 243%; but we could not get so many as that, could we? That would be almost two and a half times the original. We could not get up so high as that; we would have to stop at 100%, and that would come in about 265 years from the present time. In 265 years from now, we will all be lunatics and idiots, if we do not stop,--at the present rate of degeneracy. It would be a good thing to stop, wouldn't it, before we get there. Of course, it would not affect us; I am speaking of the race as a whole. We won't be there 265 years from now; but in 265 years the whole race will be lunatics

and idiots if they keep on going down at the present rate; and I am sure the rate is increasing. Today in Illinois there are 10,000 lunatics shut up within the high walls, fenced in to keep them away from other people--dangerous lunatics. I was talking with the secretary of the State Board of Charities of Illinois a short time ago about that matter, and he said that does not tell half the story. He said, "I have been collecting statistics during the last year on the question of insanity in the State of Illinois, and I am satisfied that while we have got ten thousand lunatics shut up in our asylums, there are 50,000 lunatics in Illinois today at large, that we haven't caught yet, at least 50,000 lunatics." There is no doubt about it--that there are far more, many more insane people outside of the asylum than there are inside. It only takes some great commotion of some kind, some great general agitation to bring it out. Every time we have a political campaign, especially a presidential election, or any great political excitement of any kind, you see lunatics breaking out on all sides; and people seem to know it. The Republican party, the members of the Republican party are perfectly able to see the lunatics of the Democratic party; and the people of the Democratic party can easily discover the lunatics in the Republican party; so with the different religious denominations; the members of one denomination can see very unbalanced people in another denomination but can not see them at home; but when one looks from an unprejudiced standpoint at out over the world, it is amazing what lack of judgment is shown; what depreciation of good sense there seems to be--the people you come in contact with, that you look at as you go down the streets, you look at their faces, and see they are unbalanced, not levelheaded, not sound people; the way people are running after things that are foolish, things that are perfectly ridiculous and contemptible; the way crime is increasing--all these things are indications of the race degeneracy that is increasing. Now, the Battle Creek Sanitarium stands as a pro-

test against these things which are found to be really leading down. It endeavors to do more than that. It is planted here to serve as a means of endeavor to stem this tide of degeneracy, and to turn it back if possible. It looks like such a hopeless task, I confess I have felt as though it was only like a little drop in the ocean--what we could do; but in recent times, we begin to see the results of seed sowing of years ago that begin to give us great hope and courage that we may be able to do something after all; that we can accomplish much more than we thought might be accomplished, and much more than has been accomplished.

I look back to my boyhood days and think of the cookery of those days. I knew something about it, because my mother was a very good cook. Our people lived on the top shelf in accordance with the ideas of those times, and the consequence of it was we were all sick. I used to help my mother cook; she showed me how to do the naughty things that were in vogue in those days. There was scarcely ever anything on the table that was not fried. The universal practice in those days was to fry everything--fried potato, fried beefsteak, fried sausage, fried eggs; things were not considered palatable unless they were fried; and the richest pies and the richest cakes, and the most spicy pickles,--everything was rich as could be; and there was not a member of the family that was not sick. We didn't know we were making ourselves sick all the time. I always had stomachache after dinner, and I hadn't the slightest idea it was the dinner that did it. I supposed it was a sort of affliction of Providence I had to suffer. I thought the fault was in my stomach, and that it was not in my dinner. Some people still entertain that notion. I met a lady in my office day before yesterday, and she had come to the institution by the invitation of a friend, and she was very much astonished at what she found here. She said, "No coffee--dear me, how shall I live without coffee? I must have two cups

of coffee at least, of black coffee; I can not eat; I can not sleep; why, I can not do anything; my head goes to pieces. And no smoking room? Why, I have to have my cigarettes. I am not allowed to smoke here? Why, what sort of place is this?" Well, she was brought to my office for me to talk to her a little bit, and I told her we were doing things for health here, and all those things were harmful. "Harmful--what of that? What is my body for if it is not to work for me? When my body won't work for me, I will dismiss it." Well, this woman certainly represents the idea in the most pronounced and graphic way; she represents the idea that people are following almost everywhere. People never stop to think that what they eat has anything to do with the way they feel; that it has anything to do with the state of mind, the condition of their nerves, or the condition of their bodies in general. "Why, we are to eat what we like. Eating is to have a good time; that is what eating is for--to give us a good time, and to enjoy ourselves; and if we can not enjoy what we eat, if we can not have a good time with our palates, what is the use of eating?" That is, I think, about the way most people feel; at any rate, it seems to be the way they act. I don't say everybody, perhaps not the great majority of mankind; but in civilized lands people who are well-to-do, increase the luxuries of the table as they get more money, have more luxuries; instead of having a big feast at Thanksgiving and Christmas and New Years and a few special occasions--as birthdays,--they have a big feast every day for dinner. The six o'clock dinner is today a greater feast in the average home, is a more bounteous and luxurious feast than the great dinners of a century ago. It has come to be almost universal--this indulgence in rich and unwholesome foods; but nevertheless, there are some evidences of progress. When we look back, as I said, thirty years ago, it was almost universal--this bad cookery, unwholesome cookery.

There was an old preacher going up and down through Michigan here on

one occasion on horseback, and itinerating through the country here, and he stopped over night at a farmhouse, and the next morning he sat at the table and was asked to ask a blessing. He has been looking the table over. It was the fashion in those days to put all the food on the table at the beginning of the meal; it was all there, and he looked it over. There were fried potatoes, fried cakes, griddle cakes, and various other fried things,--fried pork and fried eggs,--everything fried,--and soda biscuit. He had gotten some ideas about healthful living, even in those days, and he didn't feel quite prepared to swallow any of those indigestibles, and he was asked to ask a blessing. He looked very solemnly at the breakfast for a moment, and said, "Friends, this breakfast is not worth a blessing"; arose, saddled his horse and went on. Now, that, perhaps, was not very polite, but he wanted to give them a lesson. And perhaps his benediction was as polite as that of Adam Clark, the great Commentator, who on one occasion was asked to ask a blessing at a table where a roast pig was the principal dish, and he said, "O Lord, if thou canst bless under the gospel what thou didst curse under the law, then bless this pig." He afterwards told the people if he was going to make a sacrifice to the devil, it would consist of a pig stuffed with tobacco. He hated the two things about equally. X

There has been a good deal of progress since then. In those days in a cook book you never saw a word about health recipes. You never saw such a thing in a magazine, or in a newspaper, or a journal, except two or three health journals that were looked upon as awfully cranky. You never saw such a thing as mention of an article of food as being particularly healthful. The thing was not considered at all. We only had one or two state boards of health in those days. Now, every state has its board of health, and you can hardly imagine how it was possible to get along without one. I remember very well when Michigan

very proudly announced that the governor had appointed a state board of health-- the second one in the United States. Massachusetts was the first; then came Michigan. The subject of health and the study of health is a matter of the last thirty or forty years almost entirely. Sixty years ago there were just a few John the Baptists crying in the wilderness, like Sylvester Graham, and Bronson Alcott, and William A. Alcott, and a few others,--Dr. Shaw, Dr. Trall and some others that were preaching the doctrine of reform in diet, and dress reform, and health reform in general; but people simply laughed at them. I remember very well when I first got hold of these ideas, when about fourteen years of age; and I was delighted with the idea because it seemed to me to be so sensible; it seemed to me to be so rational. I don't remember it ever occurred to me that my health would be any better if I changed my diet; I don't think that ever occurred to me at all. In fact, I didn't feel any better after I had changed my diet. I had been accustomed to eating all kinds of fried things, and greasy things, and when I changed my diet and dropped out those fried things and greasy things, I began to suffer at once from sour stomach and heartburn. I had terrible heartburn, lost flesh, was rather miserable, got weak in the knees, and I didn't see any improvement so far as my health was concerned, from the change of diet, for a very long time, until I learned a little better how to manage my stomach; but the thing was so satisfying, the fact that it was the right thing to do, that I took great satisfaction and comfort in it, and I never for a moment had the slightest idea of abandoning the new way, although, as I said, I didn't get any particular comfort out of it, but rather discomfort.

Now, in those days, it was the most common observation to meet people who were scoffing and ridiculing all these notions of diet. Why should a person pay attention to what he eats? Why shouldn't one eat what he wants to eat? The idea of its being unhealthful to eat fried pork,--of its being improper to eat fried sausage, and fried oysters, and all kinds of abominations, and mince

pies. It seemed to be the most preposterous and ridiculous idea in the eyes of the majority of people. Nobody knew anything about graham bread in those days. If we had graham flour, I remember when we first began to use it, there was one mill in the state of New York that made graham flour, and not another one in the whole United States. That was the only place it could be gotten. Sometimes people would go to the mill and say to the miller, "How much fine flour do you get out of a bushel of wheat?" "I get so much." "How much bran do you get?" "So much." "How much fine middlings do you get?" "So much." "Now, won't you give me so much fine flour, and so much bran, and so much shorts?" Then we would take them and mix them all together, and we would have graham flour. That was the only way we could get graham flour. It was not really the best kind of graham flour, but it was better than none, and these little gem pans you see, the little baking irons that are used now were invented in those days. Those were invented for the express purpose of making graham gems, making bread without yeast. That is what they were invented for, and the first ones we had here in Battle Creek were sent by mail from down in New York. It was cheaper than express in those days, and we had them shipped on here by the ton after we got a little diet reform movement started here, and used to send them out by mail from here all over the United States. The express business, as I said, had not yet been well established, and that was the only way you could get them; and people in traveling about, some friends of mine I remember, particularly one lecturer used always to carry his gem pan with him, and a little sack of graham flour, so he could have graham gems. That was the only way he could get them when traveling about over the country.

I remember how delighted I was about twenty-five years ago when I first found ~~it~~ it was possible to get graham bread in the cities. The

time I have been talking about was some 43 of 44 years ago; but in traveling about about twenty-five years ago, I found it was possible, by hunting up the proper bakery, to find graham bread. It was very rare, however, twenty-five years ago that one could get graham bread, and you could not get it at a hotel. Now you can get good graham bread at almost any hotel or on board ship. Go to Germany, or all over Europe, and you can get graham bread. The word came from the name of a man by the name of Graham who first suggested this method of making bread from the entire grain. That was the old fashioned way. He didn't invent the idea, for that is the way in which the bread was originally used, the way in which the Indians made it and the way they make it now; but it became so uncommon that the use of graham flour dropped out entirely; the flour must be superfine, the process of bolting had been discovered, and the modern mill, so the bran was left out, and the fine middlings were left out, and with those fine middlings and shorts went the very best part of the grain; so all we had left in those days was the fine starch of the inside of the kernel; and the farmer took his bushel of wheat down to the mill, and he carried it back--had it ground and carried it back, had the starch in one bag and the shorts in another, and ~~the~~ bran in another; and he fed the bran to his cows and the shorts to his ~~dogs~~ pigs, and the starch on the inside he fed to his family. The pigs got the best of it, you see, altogether; and that is why the pigs got fat and the boys and girls got thin and lost their teeth, so the pigs got fat enormously and improved under this arrangement; and at the present time we have the finest pigs that were ever seen, because they had this good food and good care and attention given to them, you see; but the people, the farmer and his family have deteriorated because they did not eat the things that were proper food; because they did not eat the things that were naturally intended for them to eat; and they have not been studying what is good to make a sturdy man, what is good to make a strong

and healthy woman; what is best to make a boy grow to his full stature, and to enable a girl to develop into splendid womanhood; that is not the question at all, and that has not been the question during all these years; but the question has been simply what we like; what is nice to eat; what we enjoy; what will tickle our palate the most. Now there has been in this last twenty-five years particularly, there has been a change.

We see people beginning to think and talk about what is healthy to eat, and when you read the magazines, you find in every popular magazine somebody advertising a health food. When we first began to talk about health foods twenty-five or thirty years ago, it was a matter of scorn; people were disgusted, you know, immensely. I remember once some thirty-three years ago now, the summer of '76, I stepped into a restaurant in Philadelphia and called for some graham bread. I called for graham bread in this restaurant, and the waiter went back, and he shouted through the opening to the cook room below, shouted out as loud as he could shout, you know, "Bran bread for one." Everybody looked around to see who that fellow was that wanted some bran bread. But I didn't get my bran bread. I would have been glad to have the bran bread, but didn't get it; they reported they didn't have any. He didn't know graham bread by name, but he went back and called for bran bread for one. I felt like a cat in a strange garret when I saw the restaurant people all looking around to see who that fellow was that wanted bran bread. They expected, I suppose, to see some emaciated invalid following a prescription. Now, there has come a change; you can get graham bread everywhere. Nobody now thinks it is peculiar for a person to eat graham bread. In those days, if a person ate oatmeal, he would be hooted at. At school if it was found out I was eating oatmeal, the boys used to point a finger at me and say, "There is a boy that lives on a horse diet."

They said I was living on a horse diet because I was eating oats. There was quite a little community of people about the Sanitarium here starting in those days, and it was ridiculed by the whole ~~xxxxxx~~ town. There are people living here today who used to heap scorn and ridicule upon the people here because we ate oatmeal and graham bread, and did not eat meat. But, as I said, that day has passed; a wonderful change has happened within the last few years, particularly within the last ten years, and the last five years. Every day great progress is being made. People are waking up everywhere to the discovery that it makes a difference what we eat.

It is just as necessary to regulate scientifically the diet of the human being as the diet of the horse or the pig. We hear a good deal about the low protein diet nowadays, but up in Minnesota, they have known for the last fifteen years, long before Mr. Fletcher ever discovered chewing, long before Prof. Chittenden made his experiments which led him to announce the advantages of a low protein diet,--long before that the agricultural experiment station of Minnesota located at St. Cloud, had discovered that pigs were a good deal healthier pigs, could be fattened more rapidly, and they were stronger and more vigorous in every way when fed upon a low protein diet; so the low protein diet had been recommended and adopted by the farmers all over Minnesota and Iowa in the feeding of pigs fifteen or sixteen years ago. I was very much surprised to learn this myself three or four years ago when talking to a farmer from Iowa about the low protein diet. "Well," he says, "I have known all ~~xxxxxx~~ about that for years; I have been feeding my pigs on a low protein diet for years." And he told me about these experiments which I had not known about previously; and he put me in correspondence with the secretary of the Minnesota station and I got further information.

You see the study has been all the time how to make strong, vigorous horses, fleet horses, to make cows to give more milk; to make more butter than any other cows; how to make splendid, great oxen; to make fat and vigorous pigs, that will fatten quickly, that have vigorous constitution--that has been the study; but how to make splendid men and splendid women--that question has been neglected.

As I said a while ago, it depends upon the women to bring about the necessary reformation. Women are the natural sanitary officials of the country. You can have as many public officials as you like, they can do nothing but depreciate the race, as I have shown you--do nothing but depreciate the race by helping to keep alive the feeble and the unfit,--unless their work is backed up by a sanitary official in the home, an intelligent housemother, as they call the housekeeper in Germany, who will look carefully after the nutrition of every member of the household, who will study into this question; and that is the great work for women to do at the present time; it is the greatest thing, it seems to me, that can possibly be done; it is the greatest work anybody can possibly ~~do~~ take up or engage in--is this work of informing the mothers of the home, the housekeepers of the land--informing these mothers how to feed their families properly. Their husbands know all about how to feed the horses, calves, and pigs; and the little boys know how to feed their rabbits, and the little girls know just how to feed the canaries; but who knows how to feed the boys and girls? The mother herself does not know anything about it; it is not taught in the universities, it is not taught in the high schools, it is not taught in the grammar schools, it is not taught in the primary schools, it is not taught anywhere. The cooking schools started out in teaching girls how to make pies and cakes, how to make fancy dishes, and at the present time too much

attention is still given to the study of unnecessary and unwholesome cookery; so with reference to housekeeping--how to take care of the house, how to do things of that sort; but at the present time there is a great advance in all lines, even in the ordinary schools of domestic economy there is a great deal more attention being given to this question of health in our universities; they are beginning to give some attention to it. Harvard has recently installed a professor of hygiene which is an innovation, for there have been only one or two schools in the United States where these professors of hygiene, these professorships have been instituted heretofore; but now schools are taking it up; they have to in order to keep up in the march of competition. They will have to introduce these new professorships. This school of health and home economics was started because it was felt that notwithstanding the progress that had been made, the ordinary school of domestic economy does not lay sufficient emphasis upon this question of health. It ought to be the one great central thought in the whole study of domestic economy--the one great central thought, how to make the home a healthy home, how to make the people living in the home healthy by the environment which is under the control of the housekeeper. The economy of the home is the very foundation of all prosperity in a nation; it must be, because health is the greatest asset. The health of its citizens is the greatest asset of any country, that any country can possibly have. When Mr. Roosevelt appointed his committee on the conservation of our natural ~~resources~~ resources, he was induced to appoint upon that committee, Prof. Irving Fisher, of Yale, who has been at the Battle Creek Sanitarium and has learned the methods and principles that are promulgated here, and has thoroughly adopted them introduced them into his own home. Prof. Fisher prepared a report on the conservation of national vitality. That was his feature of the report he prepared in a little book which I hope every one of you will read. You will find in it

some of the very things I have been telling you about. Prof. Fisher said to me a few days ago when I met him at Chautauqua, that he was sorry he did not put more emphasis on this matter of race degeneracy. He did not appreciate how much we are degenerating. He was a little afraid to touch this subject. The purpose of this report was to sound a general note anxiety and apprehension through this conservation of the natural resources.

Professor Fisher found that by very simple means that can be set in operation and adopted by the housekeeper,--that by these simple means fifteen years can be added to human life easily, and that by thoroughgoing attention to these habits of life, several times that number of years could be added to human life. At the present time the average length of life in this country is only forty-five years; it ought to be three times as many. People don't die of old age at all hardly. That is one thing that is noticeable. I mentioned to you that in all the leading chronic diseases there had been an increase in the mortality. That was true with reference to every chronic disease except old age. It was noticeable that the number of people put down as dying of old age is diminishing, in the statistical tables. That is the universal chronic disease, but there are fewer people dying of old age. You say right away we must be getting very healthy. It is not so at all. It is because they do not get a chance to die of old age; they die off so early they are not old. You could not say a person died of old age when he died at fifty, could you? So the number of people who die of old age is diminishing; while the number of people who are dying from all other chronic diseases is increasing constantly from year to year.

Now, you women who come here to take this course of study, if you make a practical application of the knowledge you gain here, can go out with

power to save life that is immeasurable in its value. Just think of it--how many homes it would be possible for ~~ya~~ each one of you, as a teacher, to reform? How many lines of influence leading upward, helpful, life-saving influences you can start! And the end of it is beyond estimate. It is the only way in which this great tide of disease is going to be stayed--is by men and women being educated to go out as missionaries; and we need missionaries right here in America as much as in any other country in the world. As Senator Hoar of Massachusetts once said, some years ago, the thing that is most needed at the present time is not so much to send missionaries to ~~xxx~~ the heathen as it is to get the heathenism out of our own country. It is not so much that civilization should send missionaries to the heathen, as that we should get heathenism out of our civilization. That is exactly the situation we are in. We are heathenish; we are barbarous in our methods of treatment of ourselves and in the things that pertain to our homes. So many things with reference to clothing, in reference to diet, in reference to household economics of various sorts--there are so many things that are far astray from Nature; that are disease-producing and destructive and pernicious. Those are the things you are going to study, ~~xxx~~ and how to stop the death-dealing things that are abroad in the land.

I hope each one of you will make a great success. I am sure you will be interested in your work, and I am certain you will have here also such an opportunity as no other students in domestic economy are having anywhere in the world at this particular time; and when you get through here you ought to be able to go out and do a work ~~xxxx~~ for helping the world that no other graduates of any other school can possibly do, because they lack the knowledge of principles and of facts which you will possess. But I must now take more of your time now, and I thank you very much for your attention.

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PHYSICAL EDUCATION

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday,

October 7, 1909, at 8 p.m.,

by

J. H. Kellogg, M. D.

We will have a few pictures tonight to illustrate the subject of physical education. First I will show you some flowers here merely to suggest the beauty and the perfection of flowers. If you had a rosebush that produced nothing but deformed roses, no perfect flowers, you would throw it away, put it into the fire, probably, and burn it up. If you had such a rosebush you would not care for it. We demand of our flowers that they should be perfection, and we are always seeking how to make our flowers a little more perfect, but we do not stop to think of ourselves. Of how much greater worth to us is a hand, a finger, an eye, a muscle--any one of our muscles,--biceps, triceps, or any other of our muscles,--of how much greater importance to us is every one of those muscles than the most wonderful flower that ever was, the most costly orchid. You would not trade one of your muscles for a twenty thousand dollar orchid would you? If you had a twenty thousand dollar orchid, you would hire a five thousand dollar greenhouseman to take care of it, to nurse it; but our muscles, every one of them is of immensely greater perfection and beauty and wonder than the greatest flower that ever was, yet how terribly we neglect it!

Here is a general view of the muscles, and here is a view of the bones upon which the muscles are formed. Now, the bones are not such uninteresting organs as they look like. They are very uncouth to be sure, and almost ugly in their appearance, yet when we come to study the bones, every bone is a thing

of beauty and of art. Each one of these little ridges you see here, each one of the little depressions and the little prominences, every one of them has a distinct purpose, and the student of anatomy has to know them all. The medical student has to learn the names of every one of these ridges, and every one of those little furrows, every one of those little facets--must ~~the~~ learn the names of them all. Each one of them is for the purpose of the attachment of a tendon, or a membrane, or a fascia, or a muscle. It has its distinct purpose.

Here is the chest--this wonderful cage in which is found the heart and the lungs. Each one of these bones has a function, and not simply as a part of the framework supporting the body, but also as a blood-making organ. Within the bone there is a certain material known as the red marrow found in the head of the large bones, and found in the flat bones--the red matter of the bone--not the gray matter which is found in the hollow portion of the long bones, but the red marrow of a bone. Saw off the head of the thigh bone of an ox, and you see there is red marrow inside, and that is where the red cells are made; that is the blood-making tissue of the body. It is a wonderful thing; it has only been known a few years, that the blood has been made in the bones. It is a wonderful thing that these great organs, which were supposed to be nothing but simply passive supports of the body, and the framework of the body,--that every minute portion of the interior of these bones is engaged in the process of making blood. It is necessary that this blood-making process should be carried on very actively because 8,000,000 blood-cells die every second--think of that. Eight million blood-cells perish every tick of the clock, and eight million more must be created to take their places; and this creation of blood is going on in the bones. These muscles are all under the control of the nerves. This represents the brain and the spinal cord and other nerves branching out from either side, and a very interesting thing is that branches are sent forward and backward

both. A branch comes out from the spinal cord, and this subdivides, one branch going around to the front part of the body, and another going back to the back part of the body; so that every part of the spinal cord, the brain, is represented in the back here. Every part of the spinal cord here is represented at least in the skin and the muscles, and tissue, of the back. Down in the lower part great nerve trunks are formed which run down to the legs, which run into every part of the body; nerve-trunks which run into the arms, and each muscle fiber is supplied with very delicate filaments from the spinal cord. The brain sends its messages down to the spine, and the spine transmits the messages to the muscles. The brain and spinal cord are sort of batteries. The brain might be considered the central battery, the great battery, the original battery, and the spinal cord is a sort of relay battery where the message is received, reinforced and sent on its way down the nerve fibers which are the telegraph wires. Impulses travel over these nerves with considerable rapidity, although very slowly compared with the rate at which electricity will travel--about 100 feet a second. That isn't any faster than a railroad train is traveling. A train traveling a mile a minute is rushing through the air at the rate of eight feet a second. A nerve impulse travels about nine feet a second--to be exact,--just about the rate of a railroad train going at the rate of a mile a minute. But that is very slow compared with the rate at which electricity travels. Static electricity goes 200,000 miles a second, which is immensely more rapid than this slow-going nerve force, so we know nerve force is not electricity, as some people think; because it travels too slow for electricity.

So there are three things necessary for muscular movement here, you see. There is the battery here, in the spinal cord or in the brain; then there is the telegraph wire, or the nerve filament for the impulse to travel over; then there is the muscle itself which is a sort of trap which the nerve springs

and which explodes. A muscular movement is a sort of explosion of energy which is thrown out, let loose, under the influence of the nervous system.

So, then, we have in the chest these wonderful lungs, and the heart, which are made to play just in proportion as the muscular activity is increased or diminished.

Now, let us glance at some of these muscles. There are something like 500 muscles in the body, 500 muscles, and we see only a few of them here. Here are some of the muscles of the face. These are very curious muscles. See how they are attached to the bones, to the skull, and then to the skin of the face. Here is a muscle, for instance, that is attached up here to the edge of the nose under the ~~skin~~ and connected to the labia here,--the levator labii superioris alaeque nasi muscle, that is called. And here is the levator anguli oris muscle that pulls the angle of the mouth up. That is what makes one smile. One does not smile because he pulls up the corners of the mouth, but he pulls up the corners of the mouth because he smiles. Here is a man that is not smiling, you see. The muscles are contracted. The mouth is pulled open here, so you see he is not smiling at all; his mouth is open, ~~This shows~~

This shows the muscle around the ribs. The whole face, in fact, is made up of a mass of muscles underneath the skin attached to the skin, so the skin is pulled around in various shapes to accord with the changing play of emotions in the brain. If these little muscles attached to the edge of the nose here are contracted very strongly, they pull the nose up, then we say a person looks scornful, turns up his nose, because he contracts these muscles that lift the end of the nose. The change is not very great, but just enough to produce a change in the expression.

Here are the internal muscles of the eye. Here are muscles attached to the eye, that roll the eye down, and roll it up; and these are curious mus-

cles that work through pulleys so the eye can be pulled in a direction contrary to that in which the muscle acts. Here are muscles all about the eye, and there are muscles that regulate the pupil, and there are little muscles in here. Here are little muscles that act upon the ear bones. Here are little muscles working upon the ear here, and here are little muscles attached about the ear, and little muscles behind the ear, and a little muscle above the ear and a little muscle below the ear,--muscles that pull the ear up. We see some people who can move the ears just a little. These muscles are still active. In the mule these muscles are very active. The donkey or the mule can turn his ear forward and backward with very great ease. It is very amusing sometimes to watch the play of a donkey's ears. I never saw a donkey that I did not find myself fascinated in watching his ears. The curious play of the ears seems to indicate something of where his attention is, what he is thinking about, and these muscles of the ears are supposed at ~~the same time in~~ some time in human beings to have been much stronger than they are, so the ear may have been pulled around a little bit and directed to the thing it was desired to listen to. Then here are these muscles of the neck, a great number of them, wonderful muscles, the front of the neck, the side of the neck, the deeper muscles of the neck, and the back of the neck. This shows the muscles of the front of the neck which are very well displayed, indeed, here, so you can see what an enormous group of muscles there is here, all operating to move the head around in various directions. Here we see the muscles of the shoulder again, and the deeper muscles of the arm. Some of the superficial muscles have been removed so you can see still more. Here are a great number of little muscles. Here are the muscles of the forearm, and the muscles of the arm and hand, and the muscles between the fingers, that move the fingers back and forth laterally. Here are the muscles of the thigh. Here are the large muscles of the thick portion of the thigh. Here are the

muscles of the hip, and here are the muscles of the feet, and the muscles of the lower leg. Here are still other muscles of the lower leg and the muscles of the toes, and the muscles of the back of the leg, showing here the great tendo Achilles, as it is called. Here are a great number of tendons by which each individual toe is moved. Here are some other muscles, big tendons of the upper part of the foot,--tendons attached to muscles which pull the toes upward. This shows still another of the lower muscles of the leg; and now we come to the muscles of the trunk--wonderfully interesting muscles. Here is the great external oblique muscle of the abdomen, or the ~~abliqus~~ obliquus externus; and here are muscles connected with the ribs and the shoulder--muscles by means of which the chest is raised up. Then we have here the latissimus dorsi, the muscle by which the arm is brought forward and downward. Here are also muscles of the upper part that are connected with the shoulder and the sternum. Now, here is the great rectus muscle. It can be more plainly seen in another slide. Here we see the same slide again. Here are the muscles of one side showing the rectus muscle, which we have just been looking at. The rectus muscle has been cut off and lies over here. This is the abdominal oblique muscle. This is the rectus muscle lying here; here is still another view of it. Most of the overlying muscles are removed so you see the lower layer of fascia which holds the internal organs in their places. Here are the muscles of the back side of the abdominal cavity. The muscles of the anterior portion have been entirely cut away. Here is a large muscle attached to the vertebrae which runs down in the calf of the leg, and here is the diaphragm above, you see, looking up from beneath. The diaphragm is a great muscle which divides the chest cavity from the abdominal cavity. Here are the muscles of the back. How beautifully these muscles are arranged here.

Here is the great latissimus dorsi we were looking at a while ago

running up here and connecting with the arm. Here is the trapezius--one of the muscles of the back of the neck, and this is a muscle of considerable consequence. Many persons suffer from soreness in these muscles of the back because of the abnormal tension of these muscles. These muscles are connected with the vertebrae, you see. Here are the vertebrae running down here, covered up by the tendon and muscle; and this is an enormous muscle attached to the top of the shoulder either side of the spine, and to the back of the skull; so the vertebrae of the larger part of the back here, and the neck are all connected by this great muscle.

Now, when a person has appendicitis, he has a tension of the muscles over the appendix. When a person has trouble with the gall-bladder, the muscles of the chest over the gall-bladder are very tense, very hard, feel almost like a board when you put your finger against them. When a person has a general severe pain in the abdomen, all the muscles of the abdomen are very tense. I have seen these muscles of the abdomen contracted so much they seemed almost to touch the backbone, and were hard as a board so that you could not make a particle of impression upon them by a very ~~extra~~ considerable degree of pressure. That is because of reflex action. Over-irritation causes reflex contraction of the muscles, causes the muscles to be set up in a spasm in order to give the part a rest. You know what happens to the eye when you get anything in it--it shuts up, squints; it is impossible to keep it open because the inflammation causes the eye to shut, causes spasm or tension in the muscle.

Now, the very same thing happens in the abdomen when there is pain of any sort there,--the abdominal muscles are made to contract in just the same way; but now the organs of the upper part of the abdominal cavity here, particularly about the upper part of the stomach, the viscera of the upper part of this region, have had no corresponding abdominal muscles which they can render tense in

in this way, and very curiously they seem to have a reflex action with the muscles of the back and the back of the neck. Whenever a person has a sore stomach, he has pain between the shoulderblades; this is reflex pain. Whenever a person has gall-bladder disease, he has tenderness here in this region, soreness of this region, and there is tenderness of the muscles and a tension there. If a person has a disordered stomach, neurasthenia, auto-intoxication, dyspepsia, he is almost certain to have tension in these muscles at the back of the neck probably as a result of reflex action through the sympathetic nerves. The third sympathetic ganglion lies right up here, and it is doubtless a reflex action over this sympathetic ganglion that causes this tension of these muscles. I was talking to a man today who had intestinal auto-intoxication, and I asked him to turn his head around, but he could not. It was simply impossible for him to turn his head around to look over his shoulder. He could not do it without turning his body around. It was because of the tension in the back of his neck. I got hold of his head and tried to turn it a little, but it hurt him very much, gave him severe pain. We find the great majority of neurasthenics, persons suffering from neurasthenia, nervous exhaustion, have more or less pain in the back of the neck, and when we come to examine it, we find a little tenderness there, a little soreness there; and it gives so much relief to press upon it. So many of you have found yourselves so often putting your hand upon the back of your neck. Your head has seemed tired, and you have found it great relief to rest it, such great relief to find a place where you can hang your head over and give it a rest,--putting a pillow under your head, and your head on the pillow so you can sleep and relieve this tension there.

This tension is the result of reflex action. It is not due to local disease. The muscles are not sick. The muscles are less likely to get sick than any other organ of the body. They are wonderfully tough, resistant organs, intended for any amount of hard usage, and they can stand any amount of abuse.

It is amazing what they will endure, their wonderful recuperating power. So when the muscle is in this condition, the disease is not in the muscle. Our osteopathic friends are very much in the habit of attributing disorders of this sort to disorders of the skin. They find tension of the muscles on one side, and of course the effect of that is to push the vertebrae a little out of place. It is exactly the same thing that happens when you bend your head this way or that way. The spine itself is an extremely flexible structure. It is intended to be flexible so we can wind and twist about in all sorts of ways; when the muscles are a little tense or distorted, they distort the spine a little, pull the vertebrae out of place so they are a little out of the right line; but the spine is made to get out of a right line. The spine is never intended to be straight as a stick; it is intended to be twisted around in all sorts of ways, and it will stand all kinds of twisting. It is amazing how much it will stand of this sort. You have seen a hunchback that has become almost the shape of a letter S. I knew a hunchback some years ago about 75 years of age and had had that position ever since he was a boy. He lived a long, hardy, vigorous life, but simply had an accident to the spine when a boy and got a crook; he hadn't had any trouble--hadn't had any headache, didn't have any neurasthenia, didn't have any neuritis,--hadn't had any of these awful troubles notwithstanding his spine was so terribly curved. An osteopath might have gotten hold of him and tried to push it back into place and it would not have done any good because it had grown absolutely into place and could not be moved. The osteopath makes a mistake in supposing the great troubles, pain and suffering all come from a little displacement of the vertebrae. That is not the thing at all.

The difficulty is in a remote organ. It may be a diseased stomach--generally is,--or a diseased colon, or diseased liver, or gall-bladder trouble, and a reflex disturbance is set up which causes tension of the muscles, and that tension of the muscles causes a slight change in the direct line of the ordinary shape of the vertebrae. But this change in the position of the vertebrae does not affect the person's nerves. If it did, it would be an awful thing to make a bow to anybody. If a simple change in the shape of your spinal column were dangerous, it would be very, very dangerous to make a bow; it would be a terrible thing to bend over and pick something up off the floor. It would be a veritable agony to twist your spine around so as to look behind you. It is an impossibility that we are so constructed that these slight movements and displacements of the vertebrae here are going to create such awful disturbances. Our osteopathic friends mistake the effect for the cause. It is an effect and not the cause. The real cause is somewhere else, causing reflex disturbance of a muscle, and the muscle becomes sensitive, sore, tense, pulls the vertebrae a little awry; and now an osteopath comes along and goes to pushing on that vertebra to get it back into place, and it does the patient good because curiously this manipulation of the muscle, this pressing upon these sore points, this tense muscle, has the effect to relieve the tension, and by relief of the tension, through the reflex action working backward, the viscera which causes this reflex disturbance here is also favorably influenced. There is nothing makes a cat feel better than to rub his back. Now, don't you remember how many times the old family cat has come around and begged you to rub its back, --put up her back to show you just how she liked to have her back rubbed? She would rub her back against your leg, perhaps to show you how it was to be done--would not let you off until you picked her up, gave her back a good, vigorous rubbing. Aristotle observed that nearly two thousand years ago. Aristotle was talking about the advantages of

rubbing, massage,--how much good it did; and he said, "Now try it; just rub a dog's back, then pick him up by the tail for a moment, then let him go and see how he enjoys himself." There is no question about the great advantage and benefit that come from rubbing.

Now, we may relieve this tension by the application of heat, or the arc light. A fomentation will give wonderful relief. The application of a mustard plaster, or rubbing on a liniment, Good Samaritan liniment, will do it, and angle worm oil will do it, and all kinds of grease rubbed on will do it; any kind of thing will do it that is rubbed on; but that is not the cause of the relief. It is not the oil that does it, but it is the rubbing that does it. Any sort of thing that creates a little skin irritation will reflexly relieve this spasm, and temporarily help the viscera which are connected with it. So when the osteopath gets hold of the head and twists it this way or that way, pulls it this way or the other way and so draws it around in one way or another, he gives the patient relief by his manipulations, so stimulating the circulation through this part and setting up a temporary relief, reflex relief in the affected viscera itself, and the patient feels better. Now, instantly, when the osteopath goes to pulling the head around in this way, if he is expert at it, he can make the head crack a little, just as some people can pull their fingers and make them crack and snap. I can not make mine snap,--they are too solidly set together, but some people can. I have seen people snap their finger and keep right on snapping it very ~~sh~~ loudly so you can hear it some distance. I suppose most of the people here can do that. Some people can crack their legs. The osteopath will go all over the person and move his joints and make them crack, and make the people think he is making them better. This cracking is simply the slipping of cartilages on the vertebrae here, just a slipping of

one joint on another. You can illustrate it yourself and see the truth of what I am telling you. Now, the very same thing may be done in the spine. Some-people have cracked their necks themselves in this way--just the very same thing you do with your fingers. It is not the displaced atlas slipping back into place; it is not the displaced axis slipping into position; it is not a displaced third cervical vertebra slipping into place; it is not a displaced seventh cervical vertebra that is put back into position again. Think of it, my friends, what an awful situation we would be in if everything that struck us would knock the atlas out of place--just think of it. If every little jar would disjunct a man's neck, think what a situation we would be in. We were not constructed that way; we are not put together that way. These vertebra are all put together so tense, bound by ligaments on all sides so that it takes a tremendous force to get the vertebrae out of place--a tremendous amount of energy; and these lesions that are spoken of by the osteopaths as being displaced atlas, or axis or some other vertebral displacements are not vertebral displacements at all, are not vertebral troubles at all. The trouble is not in the bone; the fundamental trouble is not in the muscle, even. The local disturbance is in the muscle, and the abnormal tension there and soreness that pulls the spine a little out of shape, perhaps, temporarily that limits its movement a little, so that it is necessary something should be done. But now these patients can be relieved, generally are relieved without any local manipulations. However, all local manipulations are beneficial, palliative, and so may be of use.

Now, let us see some more of these muscles. There are five different layers of these muscles. The great ~~ax~~ outer muscles have been taken off so now we see some of the lower ones. See the great number of muscles up around the neck here, how they are connected with the spine. There are more muscles almost than it is possible to count here in the spine. Here is the last layer

of muscles that lie right down next to the ribs, muscles that run between the ribs; so you see there is an abundant supply of muscles here. I don't suppose a monkey ever had a displaced atlas or axis or suffered particularly from headache, because the monkey keeps himself in such a state of vigorous activity that he hasn't any time or opportunity for his muscles to get stiff, sore, or irritated. These creatures are curiously like ourselves, so the same is true of nearly all creatures, for that matter.

Now, for instance, here is a human leg; here is the human hand and arm. Now here is the hand of a monkey. See how like ours it is. Here is the shoulder blade and arm bone--four arm bones and five fingers just like ours; but he has got accustomed to walking on his fingers, you see; but he can use his hands just as you or I, perhaps even more so. Here is a dog, and he has an arm very much like ours. Here is the dog's arm, and you see he has four fingers too,--two little fingers that don't touch the ground very much, but he has two that are on the ground. Here is a sheep's leg, and the sheep walks on the tips of his fingers as the dog does. When the man goes down on all fours, he puts his hand flat upon the floor and walks upon the palm of his hand, if he walks that way at all. The monkey walks upon half of his palm, and the dog walks just on the end of his fingers. The sheep walks on the very tips of his fingernails, but here is another finger up here. Here is a finger, you see, and the hand goes from here down. There is his forearm up here.

Here is the horse. He walks on one finger, but the geologists find fossil horses who used to have five fingers, and some of them had three. A little ways up the horse's leg you find a little point that used to be a big finger, but now is a little one.

Here are the legs of a man, and he walks upon the flat of his foot, you see, or the palm of his hand, if it were called a hand; and here is a gor-

illa walking in the same way. Here is a dog. You see he has got his fore-fingers down on the ground here, or just a part of them. Here is the sheep and here is the horse again; so we are very much like these lower creatures, and like them, we should lead an active, vigorous life, developing all our muscles. What is a horse good for that is kept in a stall all the time? Here is a man who sits in his business office, shut up day after day, day after day, just like a horse shut up in a stall, or a monkey put in a cage, with no means of exercise. It is impossible for such a man to enjoy good, vigorous, active life. Man is naturally as active as a monkey, or as a wild horse on the prairie. He is one of the fleetest animals that is known. The wild man of the forest can run down wild animals. He can match them with his hands. Man was made with marvelous vigor. There was the great scientist, Agassiz, who spent so much of his time in the field studying creatures, a man who lived to an advanced age, strong, vigorous, maintained his wonderfully active life up to the very last moment. I had the pleasure of being acquainted with his sister who was at one time a patient with us here and a most delightful character.

Now, because of our neglect of ~~our~~ to use our bodies, we are becoming more and more degenerate, so that some sets of muscles ~~are~~ we have almost lost the use of. We find the average man cannot run a half a mile. I do not know, but I expect it would be pretty safe to offer a prize of five hundred dollars to be distributed among the people if there could be found twenty people in this audience that could run two miles. I doubt if there are twenty people here who could run two miles, and yet you ought to be able to start out and run pretty steady for half a day. Man has just as good facilities for running as a horse has. A man that is well trained can out travel a horse. The pedestrian Weston has tired horses out many a time. A well trained pedestrian can tire out two horses every day. It is harder for a horse to travel than for

a man. The horse has not the power and the endurance that a well trained, vigorous man has. But we find very, very few people that have use of their bodies, because we have allowed them to fall into decadence. What a mistake it is,-- these splendid, beautiful muscles that have been given us for our comfort and for our use,--what a terrible thing it is for us to allow them to fall into decay, so that they lose their power, almost altogether,--just barely able to move around. Now, the ancient Greeks had a very different idea of this thing. They required their men and women, their boys and girls all to work in the gymnasium every day to develop splendid bodies. It was a disgrace to be deformed, to be deficient in any way, or to be weakly or feeble among the ancient Greeks.

~~Under the~~ In the time of Lycurgus, it was a great disgrace, such a disgrace that parents would not rear a child that had a deformity. It was supposed to be one of the duties of the midwife to destroy at birth a child that had any deformity. This practice prevailed among the ancient Romans also, and they considered it the proper thing to do. If any defect of any sort was discovered in a child by the midwife, it was the duty of the midwife to destroy that child. Children were treated by those people exactly as you would treat the imperfect flowers of the flower garden. Of course, that is inhuman; we can not commend that; but when we have splendid bodies given us by heredity, what a pity it is that we should allow them to fall into decay, to become useless, to become huge masses of fat, become ungainly, to become stiff, rheumatic and deformed by disease--what an awful thing! It is simply the penalty we suffer as the result of our own wrong habits, of our own neglects. It is not an infliction of Nature; it is not a penalty inflicted upon us by an all-wise Providence,--it is simply the results of our own wrong-doing. "Whatever a man soweth that shall he also reap."

Look at this beautiful figure. Here is the gallery of the Louvre, Paris. See these ancient figures. There are great galleries in those great museums of collections from the ancient Greeks, and models of the ancient Greeks. Here is the work of a modern sculptor--the Greek Slave. Notice all these beautiful lines, and the perfection of grace in a thoroughly well developed figure. Now, notice that the artist gives plenty of room at the waist here, and all the ancient Greeks did. There is plenty of waist room here. You do not see any furrows of waist contraction. See the wonderful muscles,--how they stand out here. We have just a few of these pictures, and we won't stop too long with them. The modern sculptor, as the ancient sculptor, when he undertakes to make an undraped figure, gives it proportions; he would not think of giving the figure the proportions which are enforced upon the figure by fashionable dress.

See these beautiful figures and these beautiful lines. They are the result of physical perfection, and this ~~physical~~ physical perfection is the result of obeying the laws of health. See how these splendid muscles all stand out. See these splendid proportions of outlines here. Here is the same thing in a young woman,--notice the splendid waist here. In a young woman a few years older, the waist would be several inches smaller. I measured some time ago the waists of thirty girls in a dancing school in Washington. I was going along the street one day and saw the girls going in, and I went up, got acquainted with the dancing master, and persuaded those girls to let me measure their waists, and I found the average waist measurement was 23 inches. I found one girl twelve years old with a waist twenty-eight inches in circumference, and a good proportioned girl, too. Twenty-three inches was the average. I got a report from Wellesley, from Dr. Anna Wood, who took measurements of some 1000 or 1100 Wellesley girls, and the average measurement was twenty-four inches,--

only one inch more than those little girls. According to that, the little girls' waists only grew one inch between twelve years of age and twenty years of age. There was something wrong about that.

Up here are some Egyptian girls. See what splendid waists they have. Those are three dancing girls that were at the Worlds' Fair, at Chicago. Here are some African girls with splendid waists, splendid limbs, and splendid arms, simply because they are splendidly developed. All these muscles we have been looking at have had opportunity for development, and they have grown to splendid proportions. Here is another Congo girl. See what beautiful proportions she has, because of her natural, outdoor life. Now, here is a girl that has handsome clothes, and has just as much freedom of movement. A Moorish girl is dressed here in a style that gives her absolute freedom of movement. She is just as free to move about as the African girls, and needs a little more clothes because she lives in a colder country. Here is a Japanese girl who also has the same freedom of movement. There is nothing at all to constrict this girl's waist except a little cord tied around her body just above the hips--a place where it does not do the least bit of harm. It is not around the lower part of the ribs where it restrains the breathing, but just around the hips, where it supports the undergarment, and it does not do the least bit of harm, to the breathing. See what vigorous women they are. They work in the fields with their husbands, and are able to do just as hard work as their husbands. I have seen them working there using the scythe and sickle, pulling carts, doing just as hard work as their husbands.

Here is a girl in a Grecian costume who also has a splendid chance to breathe and for actions. We have our habits of sitting and walking, and all our habits of moving about are so perverted, so abnormal, they entail deformity

to a very large extent. Most of the people sitting here in this room are sitting in a relaxed attitude at this moment here. I noticed as soon as I turned around, quite a number ~~of~~ straightened up. It is a curious thing isn't it, how when we get our attention occupied with something, we naturally relax, so that if we are not careful, we get into some wrong attitude which may be multiplying disease, working while we are asleep, continually, while we are not giving attention, and making us sick. Now, we are all the time under the control of gravitation. Gravitation is all the time pulling us down, is always working at us. Now gravitation is like sin--it is always pulling us down, working at us all the time, dragging us down all the while. We have great internal viscera here--the liver, that weighs three pounds and a half, and the stomach that sometimes weighs more than that after a big dinner; and the bowels, and the spleen, and these other organs, all around the upper part of the abdominal cavity, and gravitation is working upon them. The only thing that keeps them up is these big, strong muscles that we were talking about a little while ago. These muscles hold the organs up in position. But just the moment you let go, down everything goes; gravitation has got them and pulls them down. I had a case today I was investigating in the office, a young woman, and she was sitting in the chair, and I was making a little examination, of her viscera, and I found to my astonishment, a girl less than twenty years old with her kidney floating all around here. Now, this young woman had never worn a corset in her life; her mother was too sensible to let her do so, and she never had any hard work to do, never had any straining of any sort, or any hard occupation in her life. She had spent her time largely in school, or sitting upon an office chair, working as a typist, or as a stenographer, but here was her kidney, three or four inches out of place, floating all around here. She didn't know anything about it. Now, as I noticed her relaxed position, I said, "Just sit up, and raise up your

your chest"; and the moment she did that, that kidney jumped right up into place. The kidney was down out of place simply because there wasn't room for it to stay at home; it had been turned outdoors, actually, by the cramped position in which this young woman had been accustomed to sit. All that was necessary was to open the door and it was very glad to get home, and it went right up out of reach so that I could not touch it at all, the moment she put her chest up. So one should stop to think of that. The moment you let your chest get down, everything under the chest goes down--the liver, the stomach, the spleen, the pancreas, the kidneys, all are pushed right down out of place, and they do not have half a chance for their life when they are pushed down that way; they become congested; the blood stagnates in them; then you have torpid liver. That is what makes the liver torpid; then you have a sluggish stomach, and the food that is in it can not get out of it because the proper pressure is not maintained. When the proper tension is maintained, the stomach remains active, keeps pushing the food along. But when you are inactive in this way, it is like a stagnant pool; and the best thing in the world to accelerate peristaltic activity and to overcome sluggish motility is to keep your chest up. Then at every breath, as the diaphragm is forced down against these tense abdominal muscles,--every breath gives the stomach a good, hearty squeeze, gives the liver a most affectionate hug and sends the blood out of it just as you would squeeze the water out of a sponge when you would compress it in exactly the same way. So, you see, my friends, it is important we should mind our conditions, that we should note what we are doing, what our attitude is. It is worth while. It is not simply a matter of looks whether we go around in this slouchy way or stand erect and walk upright. The Bible says God made man upright, but we don't generally find him so. Watch the people who go by on the streets, and you do not find them upright; you find most of them round shouldered, the chin hanging

down, going about with a slouchy gait--don't have the elasticity and vigor in their step. This comes, as I said before, from the cultivation of the muscles, so that the muscles are full of energy, have the proper tone and hold the body erect, keep ~~vixar~~ the figure in the proper attitude. You noticed that every one of those figures we were looking at had a hollow back, ~~convave~~ behind and convex in front. That is the natural attitude, but you do not find that in the majority of people. Most of the people sitting here now are concave in front, ~~and~~ humped behind. You should remember the chest belongs in front. You see any number of people going about dragging their chests behind them instead of carrying them in front as they ought to do. You see lots of people marching about with their hips in front when their hips belong behind. Such people think they are very portly when, as a matter of fact, they are simply out of shape, with the hips in front when the hips belong behind.

I remember very well a young lady who came into my office some years ago, and she said, "Doctor, you see at once what is the matter with me?" I said, "Why, what is it?" "Why," she says, "don't you see? I am getting fat; I would give anything to get rid of this fat." "Oh," I said, "I think I can ~~care~~ cure you in five minutes." "Oh, can you? You mean a surgical operation?" "No," I said, "I won't cut anything off at all." So I made her stand up. So she stood up and waddled around,--she really thought she was awfully fat; but I made her stand up, look up to the ceiling as high as she could, threw her head back as far as possible, and that put all these muscles on the stretch, you see; I made her keep looking up at the ceiling, and that stretched them a little more, then I put my hand on the hollow of her back, made her bend over while looking at the ceiling, then told her to straighten up. She straightened up this way, pulled down her chin, and I said, "Now, look." The fat had entirely disappeared. She looked around the room as though she really expected to see a great lump of fat lying around somewhere. She was the most astonished woman you ever saw.

The trouble was she had been simply going around with the hips in front instead of behind where they belong. When the hips are held back where they belong, it is not necessary--well, the ladies can dispense with some unnecessary accessories; some accessories would become quite unnecessary to give the figure the proper shape. The fashion mongers have invented various sorts of accessories, certain bandages are applied behind, and some bandages applied in front to balance things up. Now, when the chest is behind, that makes the chest lean in front, and you must have something in front to balance up the figure; and when the hips are in front, you must have something behind. Put the hips behind where they belong, and the chest in front where it belongs, and that dispenses with all these unnecessary fixtures. I am mentioning this to show you the truth of what I am telling you,--that it is a matter of proper poise. We should stand in such a position that we can go right up straight any moment without swaying at all; go right straight upon the toes without swaying a particle. Now, when one stands with the hips forward, this way, and the shoulders behind, and he undertakes to rise on his toes, this is the way he goes,--he can not go up in any other way, you see. It is impossible; but when one stands in a properly balanced position with the chest forward, he can go right straight up and that is the best way to get a balanced position.

Now it is impossible for one to maintain such an attitude without a proper muscular development, and this muscular development comes through exercise, and it can not be gotten in any other way. You can not buy it; you can not get it out of a bottle; you can not get it by massage, by the rubbing on of things, or by the laying on of hands, or anything else of that sort. You can not get it in any way but by actual work. You have got to use the muscles. These muscles, however, get relaxed, and when they get relaxed, gravitation pulls the shoulders forward and the head comes forward. The muscles of the back become relaxed

become relaxed so that it bows out in the back and you are round shouldered. The muscles of the abdomen relax, and that lets everything drop out of place, and the abdominal region becomes stagnant, a stagnant pool in which large quantities of blood accumulate which we ought to have in the brain and spinal cord and muscles doing work--they simply accumulate, as I said, in a stagnant pool. Somebody has called it a splanchnic pool. We can get that blood out of that pool in two minutes by pulling the chest up and making these muscles taut.

We find it hard to get people to appreciate the value of exercise. We have great facilities here for exercise, but I look into the gymnasium frequently and I find but a few people there. Every man and woman that comes to this institution ought to work, and he can get more permanent good out of this muscular work than almost any other thing we have here. As a matter of fact, very few of you needed to come here if you had only been willing to do the things at home you ought to do, and to do it methodically and systematically, every day,--you would not have had to come; and now while you are here, you ought to learn how to do the things to keep you well after you go back. We don't want you to come wandering back here to be helped a second time. We don't want you to backslide when you go back, but to keep climbing up; and I say to you my friends, in all sincerity, that there isn't any reason in the world why any one of you who gets benefit here, gets a start here, could not go right on climbing up for several years after you go home. You don't know how much good you are getting here. You only get a little start. Six months from now, if you keep right on, you will find yourself climbing up to greater and greater heights all the while, and in three or four years from now you will be surprised that you ever thought yourself well at all, compared with what you are then. It is very necessary to sit right. But it is hard to sit up in a chair with no support for the back. I suppose chairs are not very natural to us anyhow. I imagine we were

never intended by Nature to use chairs; I suspect we were intended to lie down when we wanted to rest. The natural man was on his feet and about when he was active; then when he was through with the activity, he simply laid down on a grassy bank, ~~ixx~~ and reclined, because in that position we are perfectly safe, you see; gravitation can not do us any harm when we are lying down horizontally. It is when we are standing up, relaxed, leaning against a wall relaxed that gravitation gets the better of us. We see so many people standing on one leg, leaning on one side relaxed; and you see when you sit down relaxed in the same way that gravitation has the advantage of you; then everything is let loose, pulls you out of place; but now then, when we are awake we should always be tense, always keep the chest up, always keep ourselves in, well set up; then when we sit down, if we are going to rest, relax, we should ~~xxxx~~ be sure we have the support of something that will keep us in a normal position. That is why the Sanitarium chairs are constructed as they are--why these chairs have reclining backs,--so as to make it easy for you to sit in the proper position. The Sanitarium chair has a support for the center of the back, so it is impossible really to get out of shape; and that is the way it should be. This chair should have a little cushion put here. You can fix your chairs at home in this way if you like. Here you see the wrong position. This young woman is getting a congested liver, she is getting a prolapsed stomach, cultivating a floating kidney; she has got a congested, or an anemic brain and a congested colon; and a diseased condition of the stomach and of the whole digestive apparatus. Why? Simply by her wrong position.

Here is the right position, and things here are going right. The blood is forced out of the stomach into the brain where it belongs. Here is the stomach in the wrong position, and this is the right position. This is the center

Here it is properly used, and here it is not properly used. Here the body is carried back far enough so the muscles ~~at the~~ in front are brought into play, and the chest is pulled up; while in this position the muscles behind the back are supporting the head, so the chest is pulled up behind instead of in front.

This shows how to get into a right position. This shows a man sitting in an ordinary chair, with no support for the center of the back at all. If you put a little cushion in there, that will give the proper support, so it will be impossible for the of the trunk to be forced back against the chair.

This shows how to get into the right position. Back up against the wall, then bend backward so the head will ~~be~~ force the trunk out in this way. Then the trunk is raised forward and the position is right. You can do the same thing against the edge of a door, and that is a very good way to do it. Put the heels, hips, shoulders, and the head against the door. The next will show the head thrown back here; that brings the trunk forward; now the next figure, as you will see, shows the head brought up to position, the trunk remaining right where it is. This young man is in the correct position. He walks forward, you see, with the hips back where they belong, the chest forward where it belongs, so he is a good looking young man. Reverse that now, put the hips forward and the chest behind, the chin hanging out over space,--you can see what a pusillanimous young man he would make.

Here is the same thing,--relaxed position, and correct position. This is how to get it,--hands upon the hips, bend forward, fix the thumbs right there when the body is bending forward, and ~~xxxx~~ rise up into position. Here is the same thing backing up against the wall. Here is correct standing and incorrect standing,--backing against the wall, throwing the head back, the body still supported; hips and heels against the wall, the head and shoulders here, and here is the proper position. This shows you how to do this without a trainer. But

while you are here, here is the gymnasium; this is the gymnasium full of patients, taken a summer or two ago, and it is brimful. We had a few more friends this summer than last, but we have not seemed to have so many in the gymnasium; but it is a good thing to see the gymnasium full. There are enough here in the house today who need gymnasium work to fill the place full, and what is the great advantage you get from the gymnasium? The most important thing you get is training in correct posture, in the things I have been talking about. Learn how to hold the muscles in such a way as to get the chest forward and the hips back-- get a correct poise in walking. This plan will give you a tremendous increase in power. I am sure some of you have noticed the fine young women nurses of the institution, what a fine bearing they have as a rule, what fine carriage they have, and what fine health they seem to have. They are all in good health. ~~They~~ improve when they come here; they have gymnasium training as you see here, and the young men have the same. A good many of these young men and women come here because of the advantages of the institution here for improving in health. They are required to dress healthfully, to take the exercises, learn to swim, and it promotes health to a wonderful degree, so in the three or four years they spend here they get very great improvement. But before beginning exercises of this sort it is necessary to have a test of your muscles, to know where your special weaknesses are. Then we have the manual Swedish movements, and the mechanical Swedish movements, and special apparatus in the gymnasium, and special exercises, etc., under the care of special trainers, ~~--~~ by means of which these weakened muscles can be trained up.

This is a strength test chart. This chart shows a great number of very weak spots at the beginning, but you see how these weak spots became the strong points. You see how wonderfully those legs increased in power. Here

is one spot here that came up to here, you see; and nearly all the weak spots improved as the result of training. So you see a more symmetrical development may be acquired. I am satisfied there is more in this physical training and developing the muscles as a foundation for permanent health than in almost anything else. Correct diet, the outdoor life, and splendid development of the muscles will accomplish for a person more than anything else I know of.

Hydrotherapy is used as a help to get out of bad conditions. A person who has been away down in a pit has to be lifted out of it. Phototherapy, electrotherapy, and all these other physiologic measures are wonderfully important, but the great foundation things that make a person permanently well and give him defense and endurance, are correct diet, the antitoxic diet, proper food properly eaten, thorough mastication of the food, plenty of fresh air and sunlight, sleeping outdoors or in the cold, fresh air at night, and exercise. This winter when our family is not so large, we are going to give very special attention to this matter of exercise, and hope to get every single person in the institution working under a trainer. If you haven't had your chart made, please have it done right away, because we are going to get right after you and the people who are with us here this fall and winter we hope to be able to give a great deal of personal attention to to see if we can't accomplish a great deal more than we have heretofore.

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)))) P E L L A G R A ((
 (((((T U B E R C U L O S I S (((
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A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday,
 October 28, 1909, at 8:00 P. M.

by

J. H. Kellogg, M. D.



I am going to show you some very distressing looking pictures tonight. I am going to show you first the way into trouble, then the way out. The only reason why we are any of us alive is because there is within us a power, a force, an Intelligence that is struggling for our lives; that is fighting for us every moment. We could not live a week if it were not for the fact that there is a living principle, an intelligent principle dwelling within us and working and fighting for our lives. We are surrounded by enemies of life that are so potent for mischief, that are so capable of striking deadly blows that if it were not for the mighty power, the intelligent power working within us all the while to keep us alive, and to combat our enemies, to destroy our foes,--if it were not for that fact we could not live a week. Now, let us look at some of these things.

In the first place, there is the air that we breathe. Fifty miles out from shore on shipboard, breathing air that has not been contaminated by the ship itself, one is taking into his lungs air that is absolutely pure. At the top of Mt. McKinley, or any other mountain that is 10,000 ft. or more

above the level of the sea, the air is absolutely pure, unless there may be a few germs that you carry there yourself. Out in the country, a cubic yard of air will contain perhaps 200 or 300 germs. In the city streets, the air always contains thousands of germs; and inside of a city hospital, you can find germs by the scores of thousands--I trust not inside of the Sanitarium hospital, at least not inside of ours. That is what you find in the ordinary city hospital. Why shouldn't it be so? The animals that pass along the street are dropping upon the pavement putrefying excreta containing millions of germs--millions of germs; and these excretions are powdered up into dust, and the street dust is simply made up of germs, mostly colon germs. Just think, then of the dust that blows into your window, that is beaten out of the carpet, that you breathe when you sweep the carpet surface, and that is made by the dust brush when you stir up the dust into the air--just think of what you are breathing down into your lungs. By the way, didn't you ever notice that when the housewife cleans up the dust in the house, that as soon as she begins to sweep or dust the old house cat gets up from her corner behind the stove and goes outdoors? Some of you have noticed that just the moment the cleaning process begins, that old cat walks out; she knows that is not a healthy air to breathe; she knows it is dangerous.

Now, this dust is swarming with deadly organisms. The parasitic germs taken into the body may take root there and grow and develop, and form abscesses that produce colitis, or appendicitis, or abscesses of the liver, or inflammation of the bronchial tubes, or eczema, or nasal catarrh, decay of the teeth, and a thousand other things. Nearly all of the chronic diseases from which we suffer are due to the encroachment of these germs; they are due to the germs themselves, or to the poisons which the germs produce. Bright's disease, abdominal dropsy, certain forms of heart disease, and many other maladies are

due to these poisons.

Those apples are healthy. That is the reason I have them up here-- to modify to some degree the awful impression of disease that comes upon us when we stop to think of how we are surrounded with these enemies of life every moment. Now, these are the little tubercle germs. They don't look very mischievous, do they? I once showed some of these germs through a microscope to a lady, and she said, "Oh, is that them? Aren't they any bigger than that? Oh, I am not afraid of those little fellows." Now, it is not the size of them but it is the way they multiply, and the poisons they produce--not the germs themselves that do any particular mischief, but a few of those germs growing in the body will produce poison, the most virulent poisons, one of the most terrible poisons that is known to man is this poison produced by this tubercle germ; it is such a dreadful poison that a minute quantity, a thousandth part of a thousandth part of a gram--just think of it,--one one hundredth part of a thousandth part of a grain, one one hundred thousandth part of a grain (and a grain is the weight of a grain of wheat you know),--one one hundredth ~~thousandth~~ part of such a grain is enough to produce very powerful effects when introduced into the human body, and to make a person very, very sick indeed. I remember when tuberculin first came around it was recommended to cure consumption, and Prof. Koch announced it would cure consumption, and I immediately telegraphed to the United States Consul at Berlin, and asked him to get some of Koch's new discovery and sent it to me, and I telegraphed him \$35, \$10 for his trouble, and \$25 for the material; and he sent me a small bottle of it in the government despatch bag for Washington, so it was sent up to me from Washington by the government, so I had some of that tuberculin about the first of anybody in the United States. I think the hospital ~~at~~ authorities of Johns Hopkins hospital

in Baltimore got some about the same time that I did. I made some experiments. I learned the dose, and I injected a very small dose into a girl that had tuberculosis of the hip joint. I had operated on her after a number of doctors already had given her up practically, and she had seemed to get well, but then it would break out again, and there it was--the most terrible sore. She was a beautiful young woman, about seventeen, and I thought I would try this tuberculin; so I made a small injection. It was so small I didn't suppose it would have any effect at all; it was such a minute quantity I said, "This thing must be a hoax; why, this is a homeopathic dose of the most extraordinary sort--such a very minute quantity"; yet that young woman had a chill, a chill first, and a terrible fever afterwards, and in twenty-four hours she was so sick I thought certainly she would die. But she didn't die. She got a little better, and as soon as she got a little better so she was able to travel I sent her home; I told her mother she had better go home; and do you know, four years afterwards that woman walked into my office in blooming health, leading a little girl by her side, her own little daughter. She got married and lived a very happy and useful life; and the poison that I thought would kill her actually saved her life. It caused such an inflammation about that joint that there was a terrible discharge, an enormous accumulation and discharge of pus, and it carried the germs off. But it was an unusually lucky case. I had another experience and I didn't want any more, and I let that remedy alone. I was amazed at the terribly toxic power of this poison produced by the tuberculin.

So, if a person has a single enlarged gland of the neck here, one little tubercular gland, he has a rise of temperature. A few of the glands there make some of this poison and pour it out into the blood continually, and although it is an extremely minute quantity, it is enough to produce powerful

effects, and to produce fever. I made this experiment some time ago: I collected the urine of a patient suffering with tuberculosis and injected a few drops of that into a rabbit, and the rabbit's temperature immediately arose. In less than three minute's time, that rabbit's temperature was away up several degrees above its normal temperature, after the injection of just a few drops of the urine of a patient that had tubercular disease.

The kidneys are eliminating these poisons, and the effect of this poison is so great, so terrible, that when a person has tuberculosis he does not generally die of the disease, that is, when he has tuberculosis he doesn't generally die of the disease of the lungs, but he dies of disease of the kidneys. Eighty-six per cent, it was found in the great hospital in Philadelphia devoted to tubercular cases,--it was found that 86% of all who die have degenerated kidneys, and the cause of the degeneration is this deadly poison produced by the tubercle germs; so it is not the germ itself that makes the mischief, but it is the poisons which the germ makes.

There is the picture of Prof. Koch, the man who discovered this germ. Prof. Koch made this discovery something like 27 years ago, in 1882. I was immediately very much interested in it, and I asked our board of directors to give me leave of absence, and I went to Berlin, or to Vienna, rather, to make a study of it, to see what there was in it. It struck me that was an extremely interesting thing. It was generally looked upon as absurd. The majority of physicians were incredulous about it. I was interested in it, and so I went over there on purpose to see what there was in it, and to make a study of the germ and its effects upon the various tissues, in the great hospital at Vienna; and I became convinced that Prof. Koch was entirely right about it; and the thing that I have been interested in from that time to now is to know how to combat this germ, how to combat it, and fight it successfully.

The experience of the medical profession has shown that ~~xxxx~~ there is no drug that has any very marked influence upon the tubercule germ. This shows a healthy lung and its tubes here, you see--a great mass of healthy lung tissue; and here is one of the lung cells. There is a diseased lung, a lung suffering from tuberculosis. Now, just imagine,--how can you imagine that there is such a thing as a medicine that you can swallow that will be diluted in the blood, distributed all over the body, that will hunt up a cavity like that and heal it up? How absurd such a thing as that is,--how absurd to suppose that any medicine of any sort will find that by any sort of hocus pocus, or laying on of hands, or Christian Science, or any other psychologic method,--that such a hole in the lungs can be healed up and cured. You might just as well ask the Christian Scientist to make a new head or nose, or eye, or something. But they do not hesitate to undertake to cure a tubercular lung. To get rid of this you have got to kill all the germs that are working upon the lung, developing in these cavities--you have got to destroy them.

Here are some of the men who have done so much in the showing of the way out. The way out, by the general concensus of opinion of the medical profession at the present time, and of all intelligent people who have given the matter any thought,--the way out is found in just one direction, and that is the direction of making the body strong, of building up the body and making the body so strong, so vigorous, so healthy, and so enduring that these germs can make no headway in their attacks upon us. It is to strengthen the citadel of life, so to speak, so that the enemy can not get in; to destroy the enemies that are developed within us, and make it impossible for any more to get in; and here are some of the men who have done more than any others. Here is Freeman and here is Dr. Detweiler, and here is our own Dr. Trudeau--the three great pioneers of the outdoor method of treating tuberculosis, each one in his own country

Dr. Trudeau was the first in this country. He had tuberculosis himself. He went up into the Adirondaks; he lived outdoors, and he succeeded after while in making so much headway that he was able to live; and now, for more than twenty-five years, he has lived up there in the Adirondaks--he can not live anywhere else, and he is able to make headway against this disease although he still suffers from it. The germs are still there. He never has risen so high above it as to get entirely well; he will die from it probably, or from the effects of the disease; that is, he has made his body so resistant that his death is slow; the germs are making slow headway. He is now getting too feeble to practice at all, although he is not an old man; the disease has weakened him during all these years so that he has come to the point where he no longer engages actively in the practice of the profession; but he stimulated enterprise in the direction of the outdoor method, so that now in almost every state in the union there are found places for the outdoor treatment of tuberculosis. They are not all sent to the Rocky mountains any more; it is impossible to do it. One time these patients were fleeing to California and to Colorado at such a rate--people suffering from tuberculosis, that the healthy people living in that country were strongly inclined to enact laws prohibiting the entrance of persons suffering from tuberculosis, for they said that it would not be long before there would be nothing else but tubercular people there, and they got to be very much frightened; and they discovered that people were getting tuberculosis in Colorado; they discovered that the disease was originating there, and in California, so that places which had been entirely free from tuberculosis were becoming infected, so that the streets were infected, the churches were infected, the theaters were infected, the concert halls were infected, and the street cars, and the whole country had become infected with the disease because of the presence

of so many people suffering from this malady. Now, ~~xxx~~ Dr. Trudeau won't recover. I am going to whisper to you what I believe to be the reason, and don't for pity's sakes, publish it abroad, because I don't want to hurt this good man's feelings,--it is because he smokes. Dr. Trudeau ought to throw away cigars. When he went outdoors and got better, he kept that cigar in his mouth and polluted the pure air he was breathing. While he went outdoors ~~xxx~~ to build up his resistance, and did build it up sufficiently to combat the disease, he neglected to throw away the cigar; he kept imbibing the nicotin, so he was all the time lowering the resistance, breaking it down; so the poor man didn't have a fair chance. He had not had his attention called to the fact that there is enough poison in that cigar to break down the vital resistance and the ability to combat the tubercle germ--in nicotin. Prof. Wright of London, has shown that very clearly.

Here is this noble face again. See what a noble face this is and what a noble man this is. He is one of the sweetest men I ever met in my life, and I was so sorry to find he had not given his attention to that matter of smoking and did not know it was hurting him, and was in such an attitude of mind I didn't think it possible that I could say anything at all to convince him of it. I labored earnestly with one of his assistants, and I think I persuaded him to some degree, at any rate, that tobacco is not a good thing. A good many doctors know it--that it is not a good thing for the tubercular patient, because it breaks down the vital resistance.

Here is the splendid face of Dr. Detweiler--what a splendid man he is. He began nearly thirty years ago to fight this battle in behalf of the outdoor method. People ~~xxxxxxx~~ laughed at him for sending his patients outdoors.

"The idea that living outdoors is going to cure a person of lung trouble--what an absurd thing!" In those days it was thought that a man who had tuberculosis must be very careful to protect himself against drafts; he must be very careful not to get cold; that he must be very careful to keep away from cold weather entirely; he must get away off to the South, to some warm place,--to the Riviera in Europe, or to Colorado, or to California, or Florida, or some other place; so they went out there and shut themselves up in their warm houses and died off--perhaps a comparatively easy death, but nevertheless they died.

To look at these people you would not think they were awfully sick, would you; but every one of them has tuberculosis--every one of them; but it is not very long after they have been sent out here in the fresh air all day long, breathing the air, taking deep breaths all the time, breathing the fresh air, absorbing the sun's rays as they fall upon them,--it is not very long before they begin to get roses on their cheeks; and if you were taken into a tubercular hospital, the last thing in the world you would suspect would be that you were in a tubercular hospital. It doesn't look a bit like it--the patients all have rosy cheeks there; they all have clear skins, and you are amazed to ~~xxxx~~ see such a healthy looking lot of folks, and you say it must be they imagine they are sick; there can not be anything the matter with them. Yet, when the doctor examines the sputum, he finds those germs there. And if you inquire about those patients, you will find that the most of them have their night sweats; they have their coughs; they have weak lungs with wasted bodies, and they have been built up, since they came there, to this splendid condition of vitality, ~~xx~~ by living a natural life. It is unfortunately the case that in most of these ~~xxxxx~~ places the superintendents, the nurses in charge, and the doctors in charge do not know very much about diet, and the patients are generally fed whatever the cook happens to take a notion to give them, or whatever the

dietitian takes a notion to give them. The doctor often does not pay very much attention to it. The patients have a great deal of meat, which is not the best thing for them and certainly, in my opinion, is one of the worst things for them, because, as I said before, they nearly all die of Bright's disease; that is the thing that actually carries them off; they don't die because they have not got lungs enough to live, but because they do not have air enough to keep the blood clean, or kidneys enough to keep the blood pure--that is the reason they die. Over 60% of them are found to have diseased conditions of the liver. This was found by the Phipps Institute at Philadelphia; and another thing has been found there-- that persons who smoke are twice as likely to have tuberculosis and to die of it as persons who do not smoke. That is a good thing for some of you smokers to put in your pipe and smoke, so you will never smoke any more.

This is one of these institutions where the patients live outdoors. Here is a little bit of a corner to live in, you see; that is a little bit of a corner that is warm, where they usually have a dressing room. Here is the wide porch where they live exposed to the air and sleep out there day and night. A man who had tuberculosis two years and went to Colorado and got well, told me he didn't make a particle of improvement until he stayed outdoors at least eighteen hours out of the twenty-four; and twenty hours was better, and twenty-four hours was better still.

There is a picture I saw myself at the state asylum for tubercular patients, or the state sanatorium for the treatment of tubercular patients, in Massachusetts, at Rutland, I believe; and I came up here one winter's day when the snow was two or three feet deep so that we had hard work to get up there, away up in the mountains; and I found a lot of people looking just like these folks, and I think they were some of the same people. . You see what happy look-

ing people they are--reading papers and books, gossiping, having a good time. Look at this rosy cheeked woman up here. I went inside and saw a rosy cheeked woman writing a letter home with great big mittens on her hands, all wrapped up with shawls and cloaks, standing up at a desk writing a letter home, with the mittens on her hands. You can imagine it was not very beautiful writing, but she had her mittens on because it was so cold she could not have them off. She had to keep the mittens on to keep her hands warm. I noticed it was pretty cold inside. I said to the superintendent, "What temperature do you keep these rooms?" He said, "The same as outdoors." "Well, but," I said, "don't you ever have any heat on here." "Well," he said, "we heat it up half an hour twice a day. We have the heat on half an hour in the mornin, and half an hour in the evening." "Well," I said, "what do you do when the temperature goes away down below zero?" "Oh, then," he said, "the patients have to go outdoors to get warm." So you can see that these people that are looking so very sick here, and feeble, these consumptives,--that they are living under conditions entirely different from what they are accustomed to live in at home. At home the consumptive, as the disease advances, gets more and more feeble, and he wants more and more heat, more fire and less fresh air, until he is shut right up in an atmosphere of the most debilitating and depressing kind. That is the way it used to be, but now, this thing is all reversed; the patient is put right outdoors, subjected to the hardships of the polar explorer, and the result is he gets well. And now why? Simply because his resistance is built up.

Now, a person never can get strong muscles without using his muscles. I met a man the other day whose muscles were very weak. He had been lying in bed three weeks. I advised him to take a little exercise, and he said, "Doctor, don't you think I better get a little stronger first?" How in the world is he going to get strong if he doesn't exercise? He had been lying three years in

bed. He was over at East Hall, and he said it was all he could do to walk over to this house; in fact, it exhausted him so he could only come once in three weeks. That man hadn't really much the matter with him but idleness. If we could just get him to work and get his muscles to going, they would build up. They would be terribly sore, and they would feel exhausted, he would feel tired, have terrible feelings afterwards; but he must do it again the next day, and then he won't feel quite so bad; and the next day again, and the next day he will feel a little better, and pretty soon he would be exercising actively. Now, that is the way it is with people who have been little accustomed to fresh air; and when they are put under these conditions, they immediately begin to improve. They are bundled up so warm they can't get cold; they go out there wrapped up with their furs and their wraps. They are kept sitting out there in the cold winter air, but they are not shivering; they are just as warm and comfortable as they can be. You can put a baby outdoors in midwinter without any danger. You only have to protect the little one. A friend of mine down in Chicago had a little one when he lived there five or six years ago, and I was down there one day, and as I came to the house, there was a little baby carriage outdoors, and there was a baby inside of it. The snow was falling, and there was two inches of snow all over that baby, but the little thing was all done up in such a way that it could not possibly be injured at all; its face was covered over with a little protection in such a way that it could not be injured in any way; yet it had a chance for the fresh air to come under, and the baby was just as happy as he could be--sound asleep. The mother of the child told me she had been threatened with arrest; that the neighbors had complained to the police that she was treating the baby with great cruelty, and the police had been in to see her and threatened her with arrest. She had quite a time to convince them that

she was doing that for the baby's good and the baby was thriving under it. She brought them in and let them inspect it to see what a splendid little fellow it was and how healthy it was, and what a splendid appetite he had, and what good digestion--how he was thriving and getting along well.

We are so afraid of cold air. Why, my friends, it is one of the best friends we have; it is one of the very best friends we have--this cold air.

There is the place where tuberculosis is generated--one of the places,--where filth is allowed to accumulate about the stable, and the cows get tuberculosis. I was talking with a gentleman a day or two ago who was a member of the board of trustees of a large insane asylum, and he said, "Doctor, we killed eighty of our cows last winter, the finest looking cows you ever saw, but they had tuberculosis. They had been kept in a stable all winter, and I suppose they must have caught it one from another." What is the cause of that? Shut a cow up in a stable, and the cow gets tuberculosis. Turn it out doors, and it gets well. They used to kill all the cows that got tuberculosis, but down in Massachusetts, where cows are scarce and people are plenty, and tuberculosis germs are everywhere, they discovered a few years ago that they would have to kill off all the cows, and they couldn't have any cows in New England if they didn't do something; so they began to look around for some remedy. Instead of killing the cows, as soon as they found the remedy, they adopted the practice of turning them outdoors, separating them and putting them in fields by themselves, letting them live outdoors; and they found cows can get well as well as people, outdoors. Prof. Trudeau made a classical experiment on some rabbits. He inoculated six rabbits with tubercle germs, injected them right under the skin so they all had it, caught it, and there wasn't any doubt about it. He turned three of them outdoors. Three he kept indoors, and the three he kept indoors all died. The three he turned outdoors had the disease

but they all got well, and the reason was, their vital resistance was built up. The cold air is just as good for human beings as it is for cows and for rabbits. It was long ago known that goats did not have tuberculosis, and it was thought it was because they were uncommonly tough, so that they can live on tin cans and brown paper, and things of that sort--that that must be the reason why tubercle germs didn't do them any harm. And it was the supposition that goats were not subject to tuberculosis; but a German doctor made an experiment, taking some goats and shutting them up in stables and treating them just as cows were treated, and they got tuberculosis just the same, just exactly the same as the cows did. It was because the goats lived out doors,--that is the reason they were tougher and why they didn't have tuberculosis.

This shows one of the German institutions, and you see what a splendid provision there is here for people to get outdoors. They go out there and sleep on the porches all the time. They are out there several hours a day, and they sleep there at night.

There are some fine cows,--splendid looking animal, healthy looking animals. You would think they were just as good as any animals you ever saw in your life, and yet they have all got the disease, because they have been in contact with human beings, and have been exposed to the same conditions to which human beings are exposed; so they get the disease for the same cause that human beings get it--it is the indoor life. Tuberculosis is a house disease; and until the whole population moves outdoors, sleeps outdoors, lives outdoors and adopts methods of life which build up the body and render the body resistant against disease so that the cells can not be destroyed by these tubercle germs, the malady will go on increasing. It is increasing. We are told by statistics that it is decreasing, but it seems that--here is the fact which has recently been pointed

out by an ingenious investigator who has gone into the matter, that since the disease has become sort of opprobrious, the man who gets tuberculosis don't want anybody to know it; it will make everybody shun him; and when a patient dies of tuberculosis, it is looked upon as a sort of disgrace to have such a disease; so the doctors have taken to reporting deaths from tuberculosis as deaths from Bright's disease, deaths from heart disease, and death from pneumonia. As a matter of fact, a great many people suffering from tuberculosis die of those maladies. The most of them die of kidney trouble, or heart trouble, or pneumonia, or something of that sort. They do not die directly from tuberculosis; so it gets into the mortality tables,--these deaths from tuberculosis get into the mortality tables as deaths from heart disease, and from Bright's disease, and kidney disease, or pneumonia, or some other malady besides the real thing. If you look at the mortality tables, you will see that the number of deaths reported from pneumonia is greatly increasing, while the number of deaths reported from tuberculosis is greatly diminishing, and one balances up the other, or perhaps a little more. The doctor has made a careful study of the subject, and he finds that in cities of 300 or 400 thousand, the disease is actually ~~increasing~~ increasing; that we have not taken steps yet sufficiently vigorous to make any headway at all in combating this disease. Something further has got to be done; and the thing that has got to be done is the building up of the constitution, the body of the individual himself. It is not sufficient to pass spitting ordinances; it is not sufficient to cause the quarantine of these patients, the disinfection of houses where have lived patients who had tuberculosis, or to require the reporting of a case; that is not sufficient. We have got to go further; we have got to teach the individual man to make himself proof against tuberculosis, to show him how he can live high enough so the disease can not reach him. If he has got the malady in his body, we have got to

to teach him to change his habits of life, and live so temperately and so naturally and so wholesomely that he will be able to build his tissues up with resistance until the germs can not do him any harm.

This shows a tuberculous liver with disease all through it. It was the liver that suffered from the disease. This is an institution that has been created for persons who are suffering from tuberculosis, especially for persons who are poor. At the present time, every civilized country is providing institutions where the poor can be taken. It is necessary that the very poor should be cared for in this way particularly, because they can not get the comforts at home they need; and it is especially important that there should be isolation of the persons who are suffering from the disease in an advanced state.

Now look at those fellows. Those fellows are coughing every day, raising tubercle germs; yet just look at them--plump, rosy cheeked. They are sliding down hill at Davos. That is the wonderful place in Switzerland near the Engadine, 5000 or 6000 feet above the level of the sea, about 5000 feet, and the snow is six feet deep in winter. I have been there, and I am acquainted with Dr. Neumann, who has charge of one of the larger institutions; and these people are engaged here in these winter sports. They slide down the hill three miles, then drag their sleds up again, and slide down again. That is the way they take their exercises. They live outdoors, are required to live outdoors, and live on simple food. When I met Dr. Neumann, the superintendent, and showed my card, he was very much interested. "Oh, you Dr. Kellogg? from Battle Creek? Come in, Doctor, I want to see you; I'm glad to see you; we have got your foods here. There is a man over there who has gained fifty pounds on Battle Creek foods. He could not eat anything else but your Bromose; he said that was the only thing that would agree with him."

We have been talking about tuberculosis so far. But a new disease

has been ~~xxxxxxx~~ breaking out in this country, a new thing that has not been known or understood until recent times; that was supposed to be confined to Italy and some other European countries, to Spain, perhaps, but in this country was altogether unknown; but recently it has been found that this malady is widely spread in the United States, all through the south, found in Chicago, found throughout the state of Illinois, and in other parts of the United States,--this terrible disease pellagra, which resembles tuberculosis in a certain way to a considerable extent. When it attacks the skin, it looks very much as though the skin was affected with tuberculosis. These are some pictures made from photographs that were loaned to me by one of the staff writers of McClure's magazine who prepared the splendid article that has recently appeared in the McClure's magazine. In the last number of McClure's magazine, you will find an article on this disease which is the most able and interesting thing that has been written on the subject. These were prepared from original photographs. I don't know whether they are all in the magazine or not. I had a fine collection to select from, and I selected some of the most interesting things.

Here are some chickens that have pellagra. It was found when these chickens were fed on moldy corn, or cormeal that had become moldy,--it was found they became pellagrous; that while no chicken had all the symptoms of a person suffering from pellagra, that when the chickens were all of them put together they had all the symptoms. One chicken would have one symptom; another would have another symptom; a chicken is too small to have all of them, you see; they would collapse, you know. See these horrible sores on the hands. Some of them get well. When that disease can be ~~xxxx~~ reached early, they recover. See this poor soul. He died a little while afterwards because of the terrible inroads of the disease. This is pellagra in a white person, and you see what a terrible disease it is. It looks very much like tuberculosis of the skin.

It also very closely resembles leprosy. It has in some cases been mistaken for leprosy. When the disease becomes advanced, it attacks the mind; it attacks the brain, so the patients have been found, many of them in insane asylums.

Here is another malady. This is a young man suffering from hook worm disease. He is twenty-five years old, but you would not think it from his face. He is dwarfed mentally and physically. Here is another case of pellagra. The patient suffers the most horrible burning, sometimes, in the tongue, the mouth, and the mucous membrane, and the patient has the sensation of swallowing live coals. One patient became so beside himself that he actually tried to swallow some live coals; ~~xxxx~~---thought it would not have any worse, or would not be any worse than what he was already suffering. Here is a peasant woman suffering from the disease in its early symptoms. Here is a whole family suffering from hookworm disease. We happen to have these pictures here, so I will let you look at them. The whole family is suffering from the disease. They are all wretched invalids. The disease is generated in the soil; the worm gets into the feet and travels throughout the body. The poor whites of the South, many of them, suffer from it.

Here is another case of pellagra. What a terrible malady you see it is. It comes from corn, but nobody knows exactly how it is. Here is a boy seventeen years old suffering from hook worm disease. Here is another boy 22½ years old. You would not think it possible, from looking at his face. Here is a picture of a corn field in which the ears have been left and have a chance to cure and dry in the sun without becoming mouldy. Here is another case of pellagrous insanity. See how perfectly terrible it is. The whole body is affected, and the brain has become affected. This is supposed to be one of the

places where the disease generates--corn put up in shocks when it is not yet dry, not entirely ripe, some of the ears mould and heat. It looks just as good as any other. The mould on the outside or in the germ of the corn goes right along to the middle, and the germs are in that way swallowed into the system, and the poisons produced by the germs. Here is a case from Egypt, you see, Cairo, a case which has very much the appearance of leprosy. See how the disease has extended in a symmetrical way. This is a case of symmetrical pellagra which is very interesting. How is it possible for any one to survive when these horrible plagues have inoculated the body, infested it--pellagra, tuberculosis, and these other diseases--how is it possible? It is only because of the great defenders in the body that are fighting for our lives, as I was saying at the start, and I am going to show you how they do it.

Here are these cells known as the white cells of the blood. When you had a laboratory blood-examination, it was reported to you that there were perhaps somewhere from three to four or five millions of red cells; and somewhere from five to six or seven thousand white cells. There were perhaps 500 times as many red cells as there were of white cells--500 or 600 times as many. The white cells are the defenders of the body, and the red cells carry in the oxygen; that is all they do--carry in oxygen; but the white cells are the body defenders. They chase the germs that get into the body; they hunt them down, and when they find them, they devour them. Here is one of these white cells which shows you how it devours a germ. There is a germ. This white cell puts out a lip on one side, and a lip on the other side, makes a little mouth, takes in that germ and actually digests it; no matter where it goes, when it comes in contact with a germ, it makes a mouth, takes it in, and it is all stomach. So it is able to digest the germ no matter where it comes in. These white blood corpuscles circulate ~~xxxxxx~~ through the veins and the blood-vessels, and the arteries, and

when they come to a place where there are some germs out in the tissues, they bore holes through the walls, creep through, then pursue these germs and capture them. They don't go hunting around for them, but go right straight to them. Without any eyes to see they have a knowledge somehow--we don't understand just exactly what it is, but they have some knowledge by means of which they are able to go right straight to the germ and capture it; take it inside and dissolve it, digest it, eat it up so that there is nothing left of it; and that is the way the fight is carried on.

Now, here is a thing that I am going to tell you about that is one of the most remarkable things of all the things known about these germ-destroying cells, or cells which are like them. There are two kinds of these cells in the body. One kind of these white cells eats up the germs, and another sort of white cells have it for their business to eat up rubbish. One is, we might say, like the health officer that goes around to disinfect rooms, to kill the germs in the house; and another is the kind that goes around and carries off the garbage from the back door. So there are two kinds of white cells,--one supposed to be the garbage removers, if you please, and the other the germ killers. I have been showing you the germ killers, and here is the other class. The red cells sometimes die in the blood-vessels, and the white cells sometimes die in the blood-vessels. There is to be found in the body, in various parts, rubbish, unusable material. For instance, you sprain a finger, or break a bone; there is then thrown out a whole lot of material that is rubbish. There are pieces of bone, nerve, muscle, tissue all together, and that is all rubbish that you want to get rid of; and these white cells swarm out into the tissues and gnaw it away little by little, day by day, eat it up and carry it away. They remove the rubbish.

Now, they do some other things. You know sometimes a person suddenly gets gray. Do you know how a person gets gray? There is coloring matter in the hair, and these scavenger germs climb up there and carry it away. Sometimes they attack the brain. Here is an old man who has been smoking all his life, has been drinking a little whiskey all his life; been suffering from auto-intoxication, and by and by his brain cells get so deteriorated by the poisons to which they have been subjected, that these living cells here, these scavenger cells, mistake those brain cells for rubbish. They say, "Here, this brain cell is not good for anything; we might just as well tear it down, carry it off." So they attack the brain cells themselves and tear them down; and that is what produces paresis; that is what produces senile dementia; that is why the old man's memory fails; that is why his mind changes, and his temper changes, and he becomes forgetful and morose,--because of the attack of these scavenger cells upon the brain cells; and by and by he dies.

Here is the same thing attacking the kidney. That is the way the kidney becomes diseased. The kidneys are exposed to poisons absorbed from the colon, poisons that have been sucked up through a pipestem, or a cigar holder, or in some other way; that have been swallowed with a glass of wine or whiskey or in other ways, in the shape of poison that changes the tissues; unwholesome things that have been generated in the alimentary canal by the decomposition of foodstuffs,--these poisons flood out through the kidney, for the kidney is the proper outlet for poisons of all sorts--they flow out through the kidney, cause degeneration of the kidney tissues, and when the degeneration has reached a certain point, these scavenger cells swarm in and destroy the kidney, eat it up. That is what Bright's disease is. That is the very thing Bright's disease is, and that is why we have Bright's disease. That is one of the most remarkable and interesting discoveries of Metchnikoff.

This shows the accumulation of tubercle cells in the glands of the lung. That is where tuberculosis gets in--through the lung cells. They travel down through the skin and get into these glands of the neck, work on down into the inside of the lung, and the lung becomes diseased. Children have that form of depreciation. Here is a great mass of these enlarged glands. This is tuberculosis in a child.

That is the last. I thought I would give you a pleasant picture to look at so you can get away from these unpleasant pictures we have been talking about a little. The little girl is saying to that little dog, "Can you talk?" And when one looks at a dog and sees his intelligence,--and one can look at the sheep with the same thought--"Can you talk",--how can we think of eating these poor creatures that have brains like ourselves, that have blood like ours, and muscles like ours? Why should we make them articles of food,--eatables,--put them upon our tables and devour them as a beast of prey might do? Why should we do it? They are made to live and enjoy life, and have a good time, as we do. I am led to make this remark and to put this picture in because some one was asking me the other day, "Are you going to have turkey for Thanksgiving?" so I thought I would announce to you tonight that we are going to have turkeys for Thanksgiving; we are going to go around over the country here, and get hold of the largest and finest and fattest turkeys we can possibly find; and we are going to have turkeys for Thanksgiving; so be on the lookout for them.

FRIENDLY GERMS

A Little Talk at the Sanitarium Parlor, Battle Creek, Mich., Thursday, December 9, 1909, at 8:00 P. M., introductory to a microscopical exhibition of germs etc.

by

J. H. Kellogg, M. D.

You have all heard more or less about friendly germs, and tonight we are going to let you see some of them through the microscope. One of the most remarkable things about these friendly germs is that they seem to be right on hand ready to take possession of us just as soon as we are born. Here is a baby born without any germs at all. The baby is absolutely free from germs, absolutely sterile. It doesn't have to be sterilized or pasteurized. It sometimes has to be spanked, and has to be sterilized morally, but it doesn't have to be sterilized from germs, for it is absolutely free from germs. Now, within ten or twelve hours after that baby is born, germs appear in great numbers in its alimentary canal. The first bowel discharges are absolutely free from germs, but within ten or twelve hours, the intestinal contents are found to abound with germs, millions of them, enormous quantities. I went to Europe a couple of years ago chiefly to find out what that thing meant. I had been studying the germs of the intestines and the stomach for twelve or fifteen years, and I finally got to the point where I made up my mind--I didn't get things straightened out very well, and I made up my mind I would begin with a baby as soon as possible after it was born, and follow the thing up. So I had specimens sent in for examination day after day, and I had the reports sent to me regularly

from the laboratory, and when the baby was a week old, I got a report, two billion germs, alive and kicking, in that baby a week old; two billion in a quarter of a teaspoonful of intestinal contents. Just think of it--about ten billions of them in a small teaspoonful of intestinal contents! It was something frightful, you know, and I telephoned immediately to that baby's mother, "How is the baby this morning?" "Why, the baby is all right, never finer; come and see her." And I saw the baby directly afterward, and could not find a thing in the world the matter. And I wondered if this was all a hoax, and if these germs were not dangerous after all. This baby had germs enough to kill a giant, and yet it was perfectly healthy. I went to Europe to find out what it meant, and I found out. I found out that these germs were friendly germs that had taken possession of that baby to save its life. Within a few hours after the child was born, two particular germs appeared in the intestine. These are the most important one of these two kinds of germs,--the *Bacillus lactis*--the germ that makes lactic acid, that makes sour milk, and the *bacillus bifidus*. Now, these two germs are exactly adapted to the baby's needs. One of these germs is able to live in the small intestine, and the other one lives in the large intestine. One of them is an aerogen, an aerobic germ, and the other is an anaerobic germ. The aerobic germs are the germs that make acid and that grow in sour milk, and they produce this acid, and that prevents the disease-producing germs from growing. The disease-producing germ grows chiefly in the colon, and the lower part of the intestine where there is no air. That is the reason why the thing is left open, wide open so there is plenty of air in contact with it, and it does not undergo decomposition very much. But a thing to undergo decay rapidly, it needs to be shut up a little, away from the air. These germs that produce decay grow with great facility. Now, one of these is a peculiar germ, the *bacillus bifidus*,

a disease-producing germ can grow. It grows under the same conditions under which the disease-producing germs grow, and so is exactly adapted to the colon. Now, it is a most wonderful thing that those two germs take possession of that baby, and nobody knows where it comes from. This *Bacillus bifidus*--you have got to go to the baby's intestine to find it. You don't find it in the food, or lying around loose in the street dust, or house dust; but it is there in that baby's intestine, and now how does it get there?

It is really a most remarkable thing, and it puzzled me very much. We like to get back as near to the source as we can. There is that baby, got those two friendly germs taking care of it. So long as the baby lives under normal conditions, those two germs nurse it, take care of it; and internally, as well as its mother takes care to keep that baby in a healthy state, but by and by the mother gets to feeding the baby cow's milk, the baby creeps around the floor, gets hold of the corner of a rug and begins to suck it. Or it has a toy, puts it in its mouth, then puts it on the floor and gets it all covered with dirt, puts it back in its mouth with some of the mud on it that came off the street on somebody's feet and was rubbed into the floor, or into the carpet, and the baby gets the filth ~~xxx~~ that came from some animal, perhaps, that was walking down the street--a horse, or a dog, or a cat, or some other beast; it goes right into the baby's mouth, and the baby gets inoculated with all kinds of horrible germs, and they begin to grow and multiply in the baby's intestines, and putrefactions are set up and the poisons are formed, and the baby by and by loses its appetite, gets a coated tongue, feels bad, and the stools begin to have an awful odor about them.

In a healthy baby the stools are not offensive. The bowel discharges of a healthy baby can be put away in a bottle and they absolutely will not decompose, but will remain perfectly intact, without any decomposition, putrefaction,

or any offensive odor for months, and months, and months. Think of that; that is the way the alimentary canal was intended to be--clean, sweet and wholesome.

But we defile ourselves with so many horrible things,--perhaps swallowing portions of the carcass of some dead beast that is undergoing putrefaction; a dead goose or a dead turkey, maybe, on Thanksgiving day, or a dead deer, which was killed away off in the forest somewhere, and has been rotting all the way in over hundreds of miles. We swallow these horrible things, and they putrefy inside, and encourage the growth of germs, and they grow along with them. That is the way we get into such awful conditions. That is why most of you are here--because of the poisons produced by these germs.

Dr. Nelson is going to show you some unfriendly germs and some friendly germs, and the friendly germs will be big ones--they are great, big, stout fellows that can kill off these unfriendly germs only if you give them a chance. This is picturesque language; it is not scientific at all, for as a matter of fact, these germs are not animals, they are not creatures; they are a growth, an organic growth, or vegetable growth; they are of a vegetable character. They belong to the class of fungi.

Well, now, you will see some other interesting things. Dr. Nelson is going to come up here and write them on the blackboard and make some pictures to show you just what you are going to see. You are going to see trichinae, blood of different kinds, human blood, frog's blood,--the real thing, you know; not pictures of it. You are going to look through the microscope and see the actual things,--and typhoid fever germs, and various other very interesting things; and among other things the wonderful taste buds that tell us how much we ought to eat, when to stop eating protein; tell us when we have masticated, fletcherized long enough; you are going to see some of all these things.
