Blood Cells:
Degrading the race

I S T H E H U M A N R A C E D E G E N E R A T I N G ?

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

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I am going to show you just a few pictures tonight to impress the ideas which I am going to try to present to you with reference to the prospects before us. An eminent scientist, Prof. Cockerell, recently contributed an article to one of our leading scientific journals on the question, What is to be the future of the human race? and he tells us if we go on the way other animals have gone on, we can ~~not~~ hope to live one hundred thousand years, but that will be the end of us; because he shows very clearly by the geologic record that all mammals have been comparatively short lived; that every species of mammal that has lived has become either extinct or changed into something else entirely different as the result of the changing conditions of life upon the planet. Now the question is whether man will be an exception. The scientists find that the mol-lusks, the oyster and the clams, the snail, the polyp, the amoeba--all very small animalcules,--that these remain the same from age to age; the geologic record shows that these humble orders of life, these undifferentiated creatures that are very simple in their organism--that their conditions of life do not materially change, but they go on from age to age. It seems indeed that protoplasm is more enduring than the hardest rocks, for the rocks crumble down and disappear, are converted into sand, wash off into distant places, but protoplasm, ~~in~~ little jelly drops,--they are hardy, retain their same characteristics age after age; but when conditions of life change too much, then the animal perishes, or else is converted into something else entirely different. So this has happened

with all the higher orders of life; all the races of mammals, one after another, the masterpieces of creation especially have perished, and there is left nothing but the poor, humble creatures--the oyster and the clam, to go on from age to age/ Now the question is whether man is going on, is going to go on like the oyster and the clam, or whether he is going to perish like the other higher mammals. Man, the zoologists tell us, belongs to the class of higher apes; that is, he has come up from the apes; he is simply an extra smart ape; his forbears somewhere back in the ages, the evolutionists tell us, were apes. Apes still seem to be holding their own. The apes are not subject to insanity or imbecility. You find the apes in a menagerie, and look them over and you will find they are all smart; you won't find any of them that are weak minded, that are backward. Go into the public schools of this country, and of any civilized country, and you will find ten per cent of the children are backward children, have to have extra care; but you never heard of such a thing as a backward monkey, or an imbecile ape, or a gorill a that was not really smart. You never heard of such a thing. The process of degeneration is not so apparent among animals as it is among human beings, and the more civilized human beings become, the more apparent the process of degeneracy is.

Now, Prof. Coekerell thinks that if we do not go down any faster than other animals of our class, than the apes are going, and the gorillas and chimpanzees and others, that we might survive for 100,000 years; but we never can live out this 100,000 years at the rate we are going down. See how disease is carrying us off. Within thirty years, within one short generation, the mortality from chronic diseases has doubled. Now, my friends, that is a thing to be thoughy about. If the mortality from chronic diseases had doubled in a thousand years it would be a calamity; it would be most an awful calamity; it would be a terrible thing to think about--that ~~an~~ in another thousand years it would be doubled again, and in another thousand years it would be doubled once more. So it would not take so very many thousand years before the whole population will be infected

by these chronic maladies. Now, instead of doubling in a thousand years, chron ic maladies xxx in the United States kill 75,000 people every year; every year three quarters of a million are carried off by these chronic maladies of the heart, and of the lungs, and of the blood-vessels, of the kidneys, of the liver, the nervous system,--these great chronic maladies, six or seven different clas-ses of them, carry off three fourths of a mill on people in the United States every year!--just think of it,--and that is a great city completely depopulated. The cemetery population is growing very fast these days. Now, see how long it would take the whole population to go on at this present rate.

A million and a half people are dying every year, and half of thesd are dying from chronic maladies, chronic diseases, and the number is doubling every thirty years. Why, in thirty years more, it will be 1500 thousand every year; and in thirty years more, it would be three million; and in thirty years more, or in ninety years from now it would be six million; and in thirty ears more twelve million, and in thirty years more, or 150 years in all, it woudd be 24 million. Now, I do not know any reason why it should not keep right on doubling, because when we look back a few years, we find that the rate of increase within the last six or seven years has been much greater than at any previous time. Deaths from diabetes, for example--a disease which is rapidly increasing in this country, have doubled in seven years--just think of that. No, I am mistaken there; I will say that at the rate it is going on, it would have doubled in twelve years--in five years more it will have doubled. Cancer out in Denver has increased nearly fifty per cent in five years; and so we are going on at this awful rate of increase, and we can not keep on very far. It would not be more than 250 years or 260 years until we would all be lunatics and idiots if we keep on getting insane at the rate we are now going. There are at the present time in New York city 750 insane people to the million--660 now to one million; and there are 5,300 lunatics in New York, and an equal number of feeble minded, imbeciles, and idiots; in the State of New York there are [redacted] 60,000

insane people; and there are 150,000 insane people, and 150,000 feeble minded people in the United States. In the State of Illinois we have ten thousand feeble minded people, and ten thousand insane people shut up in the asylums there; so we are going down very fast you see, much faster than other members of the mammallian family of creatures, much faster than any other species of mammals--we are going down much faster than any of them because of our very wide departures from normal conditions. See how we have departed, for instance, in the matter of diet. If an animal changes its climate or its dietary; if its food supplies change, or the climatic conditions change, the animal goes to the wall, because its natural conditions of life have departed from it; it has been deprived of them, and as a result, it begins degeneration. That is why the mammals become extinct.

Now, man has dodged this evil to some extent, by his ability to travel, to change from one country to another; and so when the climate became oppressive, in one country, he could go to another. For instance, in Greece, when Greese reached the very height of its glory, of its marvelous civilization, malaria came in, the Anopheles mosquito came in upon Greece and destroyed it. The destruction of Gree ce was due less to the Turk than to the Anopheles mosquito. Modern researches have shown that to be the practical truth about it; it was malaria that destroyed Greece, and not its active human enemies; but the world has never at any time been afflicted by any pest from which there was no escape; there has always been some other place to go to, so that the human beings have found it possible to modify their diet, and as an emergency diet they began at first to eat meat, and beame flesh eaters through the urgency of famine or some other emergency; so man has become omnivorous, and by being omnivorous, he is able to live in any part of the world,--in the arctics, where vegetables do not grow; or in the torrid regions on a vegetable diet. But now althoughman had been able to live for the time bein_ to escape starvation, he has not escapted

the degenerative, destructive influence of this change of diet. A dog naturally gets on very well with the carnivorous diet, the meat diet, gets on very well because he has a liver made for a meat diet; and he has an intestine made for a meat diet. a

The dog's intestine is about half as long as a man's intestine in proportion to his length, and his liver is four times as big. Now the short intestine makes it possible for the dog to get along very well with a putrescent diet or with a meat diet. In the first place he has powerful gastric juice, much more acid and much more powerful than that of human beings; much more powerful and more active gastric juice; it is able to disinfect the most rotten flesh, that you can give him to eat. A physiologist made an experiment of giving a dog some very rancid meat. Half an hour afterwards he killed the dog, took this meat out of his stomach, and it was perfectly fresh and sweet; it had been completely disinfected and deodorized by the gastric juice of the dog. I see some of you smiling, and wishing perhaps that you had that kind of gastric juice so that you might eat pate des foies gras with impunity; but it is fortunate for us that we have not that kind of gastric juice because along with this powerful gastric juice, the dog has a liver that is four times as powerful as the human liver. He has a liver capacity four times that of the human animal. So with this short alimentary canal, with the stomach which has this powerful digestive power, these powerful digestive properties, the short alimentary canal, the animal is preserved against the effects of putrefaction, of autointoxication. There is very little opportunity for the flesh food to undergo putrescence; it is thoroughly disinfected in the stomach, and then the short alimentary canal does not give an opportunity for any extensive putrefaction; and then if there is a little putrefaction, if some poisons are absorbed from the body, the dog's powerful liver is able to destroy those poisons, for that is the princip al work of the liver--is to destroy poisons and protect us

against their malign influence.

Now, when a man undertakes to live upon a dog's diet without the protection which the dog is provided with, evil consequences naturallyxi arise very quickly. If a man is going to ive upon a dog's diet, if he is going to eat flesh, he ought to have the dog's liver to take care of it, don't you see; he ought to have the dog's stomach to digest it, and then he ought to have the dog's liver to destroy the poisons that come from it; and he ought to have his alimentary canal amputated, as Dr. Lane would have us do, so there would not be the opportunity for it to undergo putrescence, and Metchnikoff six or seven years ago began to advocate the abbreviation of the colon. He says we have begun by cutting off the appendix, and now we ought to keep on and remove the colon, and then with shorter colons, we would have longer lives, because old age, senility of old age is chiefly due to the evil effects of poisons absorbed from the colon, poisons that are produced by the putrefaction of undigested food remnants. Now, this is an important thing to know; and these are facts that have been proven scientificàlly.

We see that the dogs can safely live upon meat without injury because of the special provision for resisting the evil effects of meat eating; but a man can not, because he has not that same provision. We have over in our laboratory across the road some very interesting experiments going on. We have two poison squads over there. One poison squad consists of four young men, healthy, vigorous young men; we feed them on various kinds of things and watch them to see what the effects are, and we take note of it and profit by it. And we have another poison squad which consists of two individuals, only, a dog and a goat. Now, we have been studying this dog and goat several months, began last January, and we give them very excellent care and plenty of food, and good kind treatment, and we examine all the excretions, just as we make examinations for human beings; we mak

we make a most thoroughgoing investigation of his case. His bowel excretions, and the kidney excretions are all thoroughly examined, the bacteria counted, and the indican estimated and all the examination made complete. Now, when these two animals were first examined after the dog had been living on his meat diet for a few days, and the goat living upon his ordinary food--nok poisons were found at all in the excretions. The excretions were found free from poison. The dog was healthy; no indican was found in either case. Indican is a poison absorbed from the bowels, from putrefaction, and excreted through the kidneys; and there was no indican at all in either case; then we swapped diets; we made the dog eat the goat's bill of fare, so far as he was able to eat it; and the goat the dog's bill of fare. The goat did not take to meat very kindly, but by grinding it up and smuggling it in, he was made to eat it, and straight away a marvelous change occurred. The dog did not suffer any; he was all the better off; but the goat began to show symptoms of autointoxication right away. Indican appeared where there had not been any indican at all before; the indican made its appearance right away, and the goat gave all the evidences of autointoxication. Now, we selected the goat for this experiment because of the goat's toughness of constitution, and because of the goat's proclivity to eat almost anything that comes along. We did not imagine we could persuade a dainty sheep to eat meat, but we thought we could the goat; and sure enough, the goat--he didn't take very kindly to it, but he did swallow it, so we were able to carry on the experiment.

Now, this shows that an animal can not thrive upon a diet which is not naturally adapted to its constitution. Now, that is exactly what is true of man. Why does the goat have trouble with the meat diet? Because she he has such a long intestine. His intestine is so long that the undigested remnants of food decay, undergo putrefaction. The beefsteak undergoes putrefaction in that

animal's intestine just exactly as though it lay around in a warm place in a corner of a closet somewhere, in some neglected corner--exactly the same, only more rapidly. The same thing is true of man; man has a long colon, not adapted to a meat diet. The eagle lives 100 years notwithstanding its meat diet; it does eat meat, but it eats its meat fresh, and the alimentary canal is so short that the foo d remnants pass through the animal quickly; there is no opportunity for purtrefaction. The same is true of the dog to a large extent. His alimentary canal is short, only four times the length of his body; whereas in man, we have an alimintary canal twelve times the length of the body; and the result is that, having an alimentary canal which is adapted to a kind of food that does not undergo putrefaction, which does not putrefy, which does not produce these awful poisons that come from decay, from rottenness, from putrescence,--having that sort of intestine, man, in undertaking to live upon a meat diet, is exposed to dangers to which these other carnivorous animals are not exposed.

Now, as I said, man, undertaking to live upon a dog's diet, suffers more than the dog does. The dog is going down hill; he can not live more than 100,000 years , the zoologists tell us, any how; it will become extinct in a hundred thousand years at the rate he is going down; and man mus be going down much faster because he has departed farther away from his normal state of life; not only in relation to diet, but in relation to other things. It is only possible for man to live in most places where the conditions of life make it possible for him to create an artificial climate. He builds houses and burns fuel in the house and makes the temperature as he wants it to be, and sometimes he makes it a little warm, as we have it here tonight. We will try to have this remedied next time. So his conditions of life are artificial. This artificial climate which he creates in the house in which he shuts himself up, he not only makes warmer, but he contaminates it, fills it full of poisons. With every

breath he breathes out from his lungs, he poisons three cubic feet of air, three quarters of a barrelful of air, and renders it impure, unfit to breathe again. With every breath he expels from his lungs he does this, so it does not take very long to spoil all the air in a good sized room. So a room with a number of people in it must have a good volume of fresh air blowing through it continually to carry off the poisons in the air. Air is the means by which our body is purified. It comes into the lungs, goes from the lungs to the blood, thavels through the body and washes out the tissues. Now, when we are going to wash some clothes that are dirty, we do not get muddy water to wash the clothes with; but we want the cleanest water that we can get. If we wash the clothes with dirty water, they would get dirtier instead of cleaner. Of course, very dirty clothes might be made a little cleaner by washing them in water that is a little dirty. It is exactly so with the air. If we want to wash out all the dirty out of our bodies, we should breathe air,which is the chief means by which the body is cleansed and washed,--we must take care that we introduce clean air into our lungs.

Man shuts himself up in the house in an artificial climate as I say, and saturates his body with unclean air, so the poisons he exhales are received back into his body again. They are reabsorbed, and the consequence is that by this artificial climate, by this house dwelling we have created, a long list of maladies have come upon us which did not before exist. Consumption is a house disease. Now animal that lives in the open has consumption. If a man gets consumption and we put him outdoors, he gets well, if we get hold of him quick enough. He may have a quarter of a lung diseased with consumption, but we put him outdoors and keep him outdoors, and he will get well. I met some time ago a distinguished college professor from the East who had consumption and went out

to Colorado, and he stayed outdoors ten hours a day, and it didn't do him any good. Then he stayed outdoors twelve hours a day and that didn't do him any good. He told me he didn't begin to get better until he stayed outdoors 18 hours out of the twenty-four, and then he began to gain; but when he stayed outdoors the whole 24 hours, he was better off yet. No outdoor animals were ever intended tolive in houses; they were intended to live outdoors in the fresh air, where every breath they take is healthy, is laden with God's health-giving oxygen, instead of beirg laden with carbonic acid gas and other putrid exhalations from our own bodies. Well, now, these two conditions are conditions which alone in themselves--a change of diet to another kind of diet, a wrong diet, a diet never intended for us, and changing the habitation from the outdoors to th the indoors, to the cave dwelling, if you please. We talk about the cave dwellers of the olden time, but we are living in caves ourselves, and we suffer from it almost as much as though we were living in a cave in the earth somewhere. The time will come when we will live in glass houses. I prophesied that about twenty-five years ago; and I was very glad to find in a scientific journal the other day that the Germans are already doing it; they are making glass brick and building houses of glass brick; so the sun can shine in and permeate the whole house. The brick may be either transparent or opaque, just as you like; but the light can shine in. Germs can not live where the sunlight is. That is why it is possible for people to live in the tropics where the germs can grow so luxuriantly, because of the heat and the moisture; but the sun kills the germs off so that they do not develop sufficiently to make it impossible to live there.

Now, these degenerative influences at work all about us are dragging us down, and the evidences of decay and dgeneracy are simply terrible; they are simply terrible; they are appalling when you come to look at them. Why, the birth rate has dropped off in the last four or five years 33⅓%,--from 36 to 24;

and that means the loss of a million babies a year--for the United States alone. Suicides are increasing; murders are increasing, insanity is increasing--all forms of diseases of degeneracy are increasing, and for the reason that heredity is multiplying the tendencies to these di seases in each generation.

Well, now I want to call your attention to a few pictures here to give you something of the concrete side of this degenerative process. First I am going to throw upon the screen here a picture of some wonderful dogs. These are some dogs over in St. Petersburg. There is a great professor of physiology, probably the greatest professor of physiology who ever lived--the greatest physiologist living at the present time,--Prof. Pawlow. Prof. Pawlow in experimenting upon human beings and dogs, particularly upon dogs, has developed a number of the most wonderful facts in relation to digestion. He has discovered more about digestion than all that we knew before. Fro m the most ancient times to the present time, nobody has discovered so much as Prof. Pawlow with his dogs; and this is the man who nurses the dogs, and takes care of them. And here are the dogs. That picture was a kodak picture taken by my secretary who was with me one morning when I was in the laboratory. I spent a few days with Prof. Pawlow in the laboratory, and he was kind enough to turn his laboratory over to me and instructed his assistants to do everything I wanted done, and show me every experiment I wanted to see, and to give me all the information possible; and he was very kindly himself. Now, these dogs had had a peculiar operation performed. The operation was done under an anesthetic, and it is not a nice operation for anybody to have done, but these dogs seemed to enjoy life notwithstanding. An opening is cut into the esophagus so that when food is eaten, it drops out into the pail or the pan here, and the dog eats it over again. These dogs begin in the morning at six o'clock, and they eat in this way until ten o'clock, eating the same food over and over and over, although a little fresh

food is added occasionally.

Now, you can see here the tube that is attached to the dog and runs dow to a little flask upon the floor that catches the gastric juice that flows out from the stomach. As soon as the dog begins to chew, the gastric juice begins to flow out of the stomach. No food comes into the stomach at all; the food drops out of the mouth and back into the pail, and the as soon as the dog gets a taste of the food, and begins to swallow it, within four or five minutes the gastric juice begins to pour out of the stomach into the flask. The dog works at this breakfast for four hours, from six o'clock till ten o'clock, until he makes a quart of gastric juice; and this gastric juice is found to be very much more powerful than human gastric juice, very, very much more powerful, so much more powerful that it will do things that human gastric juice will not do. Prof. Pawlow's assistant has a laboratory where he keeps a lot of these dogs in the little dog dairy, and he produces gastric juice in this way and ships it all over the world. We have a shipment coming in every few weeks here, and have some down in our laboratory now. When we get somebody whose stomach won't digest at all, we let them have a little of Pawlow's juice. Now, I have not prescribed any of it recently; I don't think any of you have ever had that prescription; but when we get a really hard case, we bring along something we call natural gastric juice; but the label is in Russian so they can not read about it, you know, so we don't have any trouble. It is all filtered and deodorized so that it is just as pure as can be. I have tasted it myself, and I would not object to it at all, because it is absolutely clean and pure. It is filtered through a Pasteur filter, and is purified so you would not imagine a dog had ever been near it; it has not the slightest flavor of dog; it tastes exactly as your own gastric juice does when you have a sour stomach, and your gastric juice comes up into the throat. It tastes more like spirits of sea salt than anything else.

Now Pawlow has discovered by his experiments that different kinds of food produce different kinds of gastric juice, and he found that when the dog eats meat that there is an extremely acid gastric juice formed. The gastric juice that is madd is very very acid. When the dog eats bread, it is a different kind of gastric juice altogether. When the dog eats milk, then there is another very different kind of gastric juice; so that the dog when it eats fat, that fat seems to hinder the formation of acid gastric juice, and diminish it to a great degree; so it has added tremendously to our knowledge, and has made it possible for us to knaw now make prescriptions scientificàlly. When a man has something the matter with his stomach, we can make an examination and find out what it is, and then we are alle to tell him what to eat, thanks to Pawlow and his wonderful dogs.

But digestion is not the whole of it. There is a wonderful story abott the blood. There are found in the blood little living creatures that swim about and are moving around from place to place, that creep along the inside of the walls of the capillaries, just as you might see a fly creeping along a pane of glass. You go out into the country at this time of year, and find a pond with a lot of slime on top of it, thake some of that slime and put it under a microscope, and you will see what is call ed the pond amoeba, a little jelly drop sending out arms and legs in all directions, and sprawling all about, and sometime it is gathered up in a little round mass as round as a ball nearly flat, and transparent as the clearest jelly. Now we have an amoeba like the pond amoeba only smaller in our blood, and every one of them is just as independent, just as independent of anything else, is just as much alive and independent a creature as a fly, or a bird, or a fish swimming in the water. It is possible to take them out of the body and to keep them alive, and study them, and to see them multiply and grow outside of the body, and perform their wonderful evolutions. They live for a week outside of the body. Now, these little living

creatures--the white cells, as they are called--are of immense service to the body. If you put some germs into the body, the germs disappear in a short time. Put some typhoid fever germs into healthy blood, and in half an hour you can not find a single one of them loose in the blood. These curious creatures have captured them all, they have hunted around for them, and picked them up as they came in contact with them, and if they get out into the tissues, these little white cells go out into the tissues after them, go hunting around for the typhoid fever germs. They are marvelously intelligent creatures.

If you have got a lot of rats in the house, perhaps you will send for a ferret, and he will run into every little rat hole in the house, and drive every rat out of it, or catch every rat and kill it. These little cell s are just as active in the blood, searching for germs. That is the reason why we are able to live; for there are millions of millions of them there. You know there are countless numbers of bacteria absorbed from the intestine all the while, taken into the blood, and are working their way into the skin and tissues, and if it were not for this fact, of millions of billions of blood-cells fighting them off, all the while, we could not live at all. But there are two kinds of these white blood cells--small ones and large ones--microphags which capture the microbes, and macrophags, the large ones, which have another sort of business.

When I was a young doctor, I hd recently graduated and was taking a post graduate course in a laboratory in New York, and one of the experiments my teacher asked me to make one day was to inject some indigo into a frog. The next morning I was asked to get some of the frog's blood and examine it under the microscope. The frog has these same white blood cells, and if it were not for that he would not be able to live in the stagnant pond as he does, in stagnant water. But he has so many of these blood-cells he is able to live in the worst sort of places. We haven't sufficient white cells so as to enable us

to live in a frog's domicile without getting malaria and getting disease. If we happen to get some malaria in from the Anopheles mosquito, itxis and we do not get the disease, it is only because these white cells have killed the parasites, so we are enabled to escape death. They would kill us the very first dose if it were not for that. I examined the frog's blood, and found in almost every white cell wmas a little speck of indico--in almost all of them, in the large ones, there was one or two or three or four or half a dozen little specks of indigo. It is the business of the white cells to do that kind of work; they are scavengers, and they go creeping along the walls of the blood-vessels, picking up little particles of this material. If you have a boil, after it gets well, there is a lump left behind there that is so greatly despised, beceuzse that little lump is made by these macrophags that creep out into the tissues and carry off the exudate, and so it by and by is reduced. Now, they do other things.

Sometimes these macrophags creep up into the hair. A man wakes up in the morning sometimes and finds his hair has been turning white over hight; it has not all turned white, but he finds some gray hairs, and in the course of a few days his hair turned white. Such a thing has happened. Why is that? Because these macrophags creep up into the hair. The hair is a hollow tube with little granules of coloring matter in it, matter of different colors in different persons, and these macrophags creep up into the hair and steal that coloring matter speck by speck and carry it off. That is why the hair gets white, why it is gray. Now, this is not a myth. You can see this process going on. The microscopist can put the hair under the microscope and see this thing going on. They sometimes lay hold of the muscles, and the kidneys, the liver, the bones, the brain, etc., and destroy them, as well as the hair. When I was in Mexico for the first time, some fifteen or sixteen years ago, I observed the policemen on the streets, and I remarked to the friend who was with me, that

I should hate to meet one of those fellows on a dark night. He said why? Because they looked so much like brigands, look so fierce. "Well, they are brigands." "How do they happen to be here?" "Well, Diaz found he could not conquer the brigands, so he adopted a device for overcoming the difficulty and relieving himself of the destructive fork of these brigands. He sent for the chiefs and interviewed them, and asked them how much money they made by their brigandage, and they told him how mubh they averaged. And he said, 'You come down to down, and I will make policemen of you, and you will make more money than you are making at your brigandage, and you will be a great deal safer; you won't lose your heads?' so they came down and were appointed for policementx." I said to my friend, "Now, suppose these fellows should some time just turn upon the city when they were unsuspecting; suppose you got enough of them and they should suddenly turn upon the city, what would become of the city?" I would not like to have that sort of fellows for policemen.

Now, my friends, that is exactly the sort of policemen we have got,--- we have exactly that sort in our brains, in our blood, in our lymphatics, all scattered throughout the tissues of the body there are these macrophags which have for their duty to remove rubbish; they are the scavengers of the body by profession; but under certain circumstances they turn upon the house itself, and tear it down, turn upon the city, if you please, and destroy it, and destroy the citizens. They climb up into the hair as I was telling you a moment ago, and carry off the coloring matter from it, and so make gray hair. They creep into the bones, as you see here, and destroy the bones. This bone is almost cut in two by these osteoclasts. This is what you see under the microscope. This is not simply a diagram, but an actual scientific observation. Here are some of the same things from the brain, the part of the brain we do our thinking with. Here are some of these macrophags that are attacking the brain-cells, and

destroy the brain; and that is the condition always found in an old person, an old man that is losing his memory, getting confused so he can not remember what happened; so he can only remember what happened away back years ago, but can not remember what happened yesterday,--that man's brain cells are being attacked by these macrophags, and that is the reason why he can not think clearly; why he is confused.

Now, here is another picture that shows a muscle fiber, one of the most interesting tissues in the body, one of the striated fibers; this is a single fiber, and when the muscle contracts, these fibers shorten and swell up so they get thicker. Here are these macrophags which have swarmed into one of these muscle fibers and are eating it up, destroying it. Here they have gotten inside and are destroying the muscle. That is fatty degeneration. That is the thing that happens to a man that uses alcohol. Sometimes the man that used tobacco has the same sort of difficulty.

Now, why is it that these marophags attack the body, under what conditions? Years ago I saw out west a poor cow staggering along opposite the railroad as I was passing through on the train, away out in western Nebraska, away out on the plains there, a poor cow was staggering along on her last legs, as the saying is, and a hawk was perched upon her back picking her backbone. Now, that cow was so nearly dead that the scavenger animal, the hawk, had pounced upon her, and was treating her as though she were alredy dead.

That is what these macrophags do. When, by bad habits of life, by the use of alcohol, by the use of tobacco, by a sedentary life, by following filling the body full of remnants of dead animals, putrefactive poisons, through chronic autointoxication, by any bad conditionx which reduces the vitality of the body, which lessens the resisting power of the body, when its vitality is reduced, the power of the cells to fight back and to resist is diminished, and

then these macrophags swarm out into the body and attackthe body itself, and that is the cause of chronic disease. That is why people get apoplexy, and that is the way we get arteriosclerosis; and this shows an artery here, the walls of wich have become thickened, become chalky and hardened by these processes of arterio-sclerosis.

This shows the inside of the artery, and this is the outside of it. The outside is enormously thickened; it is in the condition of the water pipe that has the inside of it lined with lime. Its capacity is greatly diminished, so it takes a great deal more pressure to get the ame amount of water through. It takes a great deal more pressure to get the same amount of blood through that kind of artery, so the heart has to work harder and raises the p ressure.

I met a man the other day in consultation who had a blood pressure of 240. His normal blood pressure would be 105. Examination of his arteries showed that they were hardened. That meant this process was beginning, it was beginning had already advanced a long ways, in fact, and that is what causes old age; it is this hardening and shriveling of the arteries. I have seen people forty years old that had arteriosclerosis. We ought not to have it until we are 100 years old. It is a disease which results from chronic poisoning of the blood, and these poisons circulating through the arteries irritate the arterial wall, and cause it to become thickened, just as any other part would become thickened when exposed to constant irritation. So you see there is good reason why the man who uses alcohol should not live out his full length of days. You see why here a diagram which shows the relative mortality of adult males, publicans and abstainers. These are derived from English statistics of the Independent Order of Rechabites, for 1878-1887.

The number of deaths in the average adult male population would be one thousand. When one thousand adult males died, there would be1642 publicans, die, and only 560 abstainers.

That is only about one third as many abstainers; so the mortality among abstainers would be only about one third as great as among users of alcohol. So a man forty or fifty years of age who uses alcoholics has only one third the expectancy of life as the man who doesn't use it; and the average man has only half the expectancy of the man who abstains. This shows the effects of alcohol; but alcohol is only one of the poisons that we are addicted to; besides alcohol there are tobacco, tea, coffee, beefsteaks, the flesh of animals, and many other poisons we are constantly exposed in our unventilated homes. This shows the effect of alcohol upon the liver. I was telling you a little while ago how important the liver is, and what advantage the dog has over human beings in having a bigger liver.

Now, the drunkard sends alcohol through his liver, and it becomes diseased in various ways. This is a nutmeg liver; this is an atrophic or hobnailed liver; here is cancer of the liver, here is an inflamed liver, here is a fatty liver--all conditions that result from the use of alcohol, but not from the use of alcohol alone. It has been found by Voix, in recent years that pepper has six times the power to make gin liver that alcohol has; and that acetic acid, the acid of vinegar, has twice the power of alcohol to produce gin liver. So we must remember that it is not alcohol alone that has this specific effect of poisoning in this regard. It behooves us all to take care of our livers. Our livers are always doing the best they can for us. People who think they have lazy livers are mistaken; they have over-worked livers; that is all the trouble. There has been too much fried sausage, rich pie and rich cake and other things of that sort. The kidneys are another organ in the prevention of arteriosclerosis. The liver destroys the poisons and protects us, and the kidneys remove the poisons and so protect us.

This is a healthy kidney; this is a kidney of a beer drinker; this is the kidney of a whiskey drinker. This is his congested kidney; here is a

nutmeg, chocolate colored kidney. When one's liver has been destroyed by overwork, poisons circulating through the body, then when one's kidneys have been damaged by poisons, the poisons rapidly accumulate in the body, and then arteriosclerosis comes on at a rapid rate. So long as the kidney remains healthy, and the liver remains healthy, arteriosclerosis can not advance very far; so when a person finds he has arteriosclerosis and he has high blood pressure, that means that his liver and his kidneys have been badly worn out, badly damaged, so that they were not able to remove the poisons, and to keep the blood clean; so this degenerative process has been going on. Then, as the arteries get hardened, the heart has to work harder, and the heart itself undergoes degeneration because its arteries as well as other parts of the body, and by and by its overwork breaks it down, then comes a dropping of the blood pressure, secondary low pressure, and that is the condition which is absolutely hopeless. There is nothing to be done except to keep the patient alive a little while if we can.

This shows how the kidney is damaged. This is the part of the kidney that secretes. These are the tubes that carry the excretion off to the center of the kidney, and thence down to the bladder. This is a part of the kidney that becomes changed to a cicatricial condition. If a person had a burn upon the skin, they would have a scar left there, and there is no sweating in that scar; the scar is always dry; it never can sweat, because there are no sweat glands there. It is not a natural skin; it is only cicatricial covering that protects the tissues; but it has no hair upon it, and it has no sweat glands within it. The same thing is true of the kidney when it becomes scarred by these poisons ; this dense, cicatricial tissue that is formed here, which has no activity; and when the whole kidney is reduced to this condition, then the person dies. The person can live with one kidney; but he must have at least two thirds of a kidney to keep him alive. This is the same degenerative process

illustrated in the heart and in the blood-vessels.

Now, there was organized three or four years ago a committee known as the Committee of One Hundred, by the American Association for the advancement of Science, having for its purpose to obtain a department of health, a national department of health, which would undertake to study the causes of this great racial deterioration that is coming on, and to endeavor to stop these causes of degeneracy, and President Roosevelt was very much interested in the matter.

This shows you the letterhead, and the long list of members of this Committee. I have the honor to be one of the early members of the committee, and I have done all I could to advance the work of this committee. Some three or four weeks ago I was asked to go to Washington to appear before ~~the~~ Congressman Mann's committee, the committee on interstate commerce and labor, to make an appeal in behalf of the Owens Bill which has been brought before congress for the purpose of securing the establishment of a national department of health. And a good many physicians were there, and others interested in the matter. Prof. Fisher was there, and other members of the Committee of One Hundred were there, and we made an earnest appeal for the establishment of this national department of health. There is nothing in the world that can be done in the direction of the conservation of national health and our national resources so important as to conserve the vitality, the racial stamina of the peopleeof the United States. President Roosevelt recognized that, and stated it in a letter which he wrote to the chairman of this committee, and President Taft has taken his stand in behalf of this committee.

I mention this here because I hope every one of you will appeal to your congressmen and senators and urge them to take a stand in behalf of this department of health. Dr. Wiley was at Chautauqua the other day when I was there, and he took a very decided stand in behalf of this department of health. It is absolutely necessary to being into one department all the various departments

or bureaus of the government which are giving more or less attention to the question of health, so that it shall be done in a thoroughly scientific way. And I trust it will be accomplished. Possibly not next year. I had a conference with Mr. Wiley at Chautauqua, and he told me he was very certain we were going to get this department; it was bound to come; it must come, because the thing is an absolute necessity. We are going down hill very fast, and something must be done to stop the down hill road.

Now, if we were all as healthy as apples, if we were as natural as apples; if the human race had been improving in the last 100 years as much as apples have been improved; if we had as many new, fine specimens of human beings as we have fine specimens of applies--just think of what a man would be if compared with other men, as a Newtown Pippin and some other of those splendid Oregon applies,--if we had human beings improving right along, and we saw new improved varieties of men and women coming up year by year, what a splendid outlook it would be. The apples a re improving, and the chickens are improving, so that they lay more eggs, and the cows are improving to give more milk; and the horses are running faster and pulling bigger loads; but the human beings are going down. Now it is too bad. It pays to give more attention to human culture doesn't it? I thank you for your attention.

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QUESTION BOX LECTURE

At the Sanitarium Parlor, Battle Creek, Mich., Monday, July 25, 1910, at 8 p.m.

By

J. H. Kellogg, M. D.

Lecture 14

Monday night always brings us some new ideas in the question box. I am greatly indebted to this question box. I am sure it has given me more original notions than any other influence with which I have been in contact.

Q. Is it injurious to drink water or other beverages at meals?

A. Now, but of course one should not drown his stomach. It is all right to take a little water if you are thirsty, but to deluge the stomach, as I saw a gentleman doing the other evening when I was eating at a table in the dining room,--I saw a gentleman swallow four large glassfuls of ice water and two large glassfuls of ice grape-juice, making six glasses in all--a quart and a half, three pints of liquid and ate a large dinner besides. I expect he will be breaking down one of these days with apoplexy, and wondering why it happened to him.

Q. What causes gases on the stomach. Do they come from the fermentation of food?

A. No, gases on the stomach really are very rarely due to fermentation of the food. The gases rising from the stomach are very rarely due to the abnormal fermentation of food in the stomach. Of course, the gases are formed by fermentation in the intestines, and it is the food which ferments; but it is a question of abnormal fermentation and diseased conditions; it is not due to that; it is not fermentation in the stomach, but it is this in general. The stomach forms too much acid. The acid closes up the pylorus so that the gses which are present there can not escape downward into the intestine as they should, as the stomach is working, contracting, trying to force the foodstuffs out through the pylorus without success, the gases are forced upward. Sometimes when it is very bad, this condition, then a little liquid comes along with the gas, or

some portion of foodstuff, the acid liquids from the stomach may be forced back; then a person knows that he has heartburn or sour stomach, and he thinks there is fermentation in his stomach; but it is hypersecretion of acid, and this excessive secretion of acid is due to flesh eating, to copious water drinking at meals, to neglect to thoroughly masticate the food, and to the use of condiments. Now, those are the great causes of hyperacidity. There is one other cause--inactive bowels--autointoxication. The five great causes are, neglect to chew the food thoroughly so that the food stays in the stomach too long, and the stomach glands are overstimulated, and the second cause is meat eating. Flesh food has the effect to stimulate the stomach. Pawlow, the great St. Petersburg physiologist, showed that meat, and the extracts of meat have greater power to stimulate the stomach than any other substance; and that they cause the stomach to make an exceedingly acid gastric juice; so when one has an acid stomach he should not eat meat. It is true that when he eats meat it relieves it, because the meat absorbs the acid, neutralises it, so temporarily he is relieved just the same as when he takes soda; but he is in the end damaged by the use of the meat because it over-stimulates the glands still further. Now, the very same thing is true of baking powders, soda, salaratus, baking powders all have the effect when used to first over-excite the stomach, and afterwards by wearing the stomach out, to produce the very opposite condition--has also the same effect which is produced by beefsteak in the end. Now, another cause is water drinking, because when water is taken into the stomach in large quantity, it causes the stomach to pour out acid. Pawlow showed that also--that liquid, that six or eight ounces of water taken into the stomach cause the stomach to pour out acid. It is a stimulant to the stomach and causes it to make acid.

Q. I do not wish to interfere with the amusement of the small boys, but in my judgment it would be a great improvement to have a separate hour in

the outdoor gymnasium for the boys.

A. Of course that is the proper arrangement. The children have their hour, and the children, unless they have tickets, unless they are patients are not supposed to be in the outdoor gymnasium during the patients' hour which is a treatment hour. The outdoor gymnasium is a place for treatment, but there is an hour for the children and a person to look after them and take care of them and teach them things and to see that they have a really good time. That is the boys' time, and there is nobody to interfere with them then, and they can be just as hilarious as they want to and it won't interfere with anybody, there won't be anybody in the way of them. That is the order and if it has not been put in motion it will be. It should have been, for that is our regular rule.

Q. Why didn't you have the lecture outdoors tonight?

I wish it had been out doors. I am a sort of wheelbarrow here; I am pushed around and go where I am sent for, where I am wanted, and I have somebody contirually looking after me to see that I get there, but I don't always succeed in getting there either, but it is because they get me to some other place where I ought not to be. I am simply a stump pulling machine that is pushed around here and there where the job is ready for me. Now is certainly a good time for a meeting outdoors. I am sorry we are not outdoors; it is the best place to be, and we ought to live outdoors as much as possible.

Q. Is Castoria a good medicine for the baby? Has it any sleeping properties in it?

A. Well, now, if you have got a baby you want to dispose of, castoria is an excellent thing. The ancients used to recommend and to justify infanticide; it was the duty of the midwife to strangle the babies at birth when they were not xx very promising; if they were homely, had pug noses or club feet, or were very ugly, or were not very nice, it was the midwife's duty to strangle the babies as soon as they were born if they were not promising; but we do not

do that; we are horrified at the idea of infanticide, but instead we torture our babies to death; we kill them by slow torture, with bottle feeding, and with drugs of varicus sorts, we drug them just so they won't be so much trouble to us. How many a mother, when the baby cries, gives it a dose of Mrs. Winslow's Soothing Syrup. Mrs. Winslow, if you could see her you would be very much surprised, for she was not a woman at all. Mrs. Winslow was a homely young man, and a very tough sort of customer he was too. He got hold of that idea of making money, and he made millions by killing babies, or helping other people to kill them. Of course, it is largely due to ignorance, but so much has been published about it, so much has been published about these nostrums, about the folly of dosing babies with medicines, that it seems to me that mothers who dose their babies must do it almost knowing that they are doing them harm. Babies sometimes are very delicate, they are sometimes very sensitive, and it takes only a small amount of a drug to do a baby an immense deal of damage, and a lifelong damage. The foundation for most chronic maladies is laid in childhood, in infancy, or before we are born. There is no doubt about that--that the great share of old, chronic dyspeptics don't know when they have got dyspepsia; they have had it all their lives, had indigestion all their lives; had trouble all their lives and don't know when it began. It began in infancy, and really they were not responsible, and didn't know anything about it; and it is the neglect or mal-treatment of babies while they are still in arms that is responsible for a great deal of this sickness. Castoria is one of the medicines that has been invented to kill babies.

Q. Would you consider the conditions of Mr. Fletcher's intestines normal?

A. Now, I have never seen the interior of Mr. Fletcher's intestines; but I have talked with him about the natural way they ought to behave somewhat, and he writes about it in his book, and what he says in his book about it is alto-

gether wrong. I am perfectly frank to tell you that the idea that fletcherism will lead to a condition of the bowels in which they will move only once a week is entirely a mistake. Mr. Fletcher does not believe that today. He has been himself delivered from that unfortunate condition; and he is I think fully persuaded that the natural activity of the bowel, the rythmic activities of the bowels, moving every day, or after each meal is the proper thing, is normal, and is proper, and that nothing should be permitted to interfere with it.

Q. In a case of catarrh of the bowels and autointoxication is it good to wash the colon every night with a hot enema?

A. It is better than it is to go to bed and to absorb those rotting oysters and other things you swallowed that are lying around there, haven't been destroyed or absorbed and never can be. It is just as important to keep the inside of the body clean as it is to keep the outside of your body clean. If your ears are dirty, you would wash them; if your teeth and mouth are dirty you wash them before you go to bed; if your face was dirty, you would not think of going to bed with an awfully dirty face. You even take the trouble to wash the hands and the feet. Why, then, shouldn't we take care of the inside of the body as well? The idea of going around with a horrible accumulation of the foulest, most horrible and putrescent condition of material in the body is most shameful, and people ought to be ashamed of themselves, who do that. I told a lady the other day that she had neglected to wash her face. She said, "You are entirely mistaken; I have washed my face well this morning." I said, "I had reference to the back side of your face." I had just seen her tongue, and her tongue was very, very dirty. She accepted my explanation, of course, but I wanted her to understand that this keeping clean inside is quite as important as keeping clean outside. How much pains is taken with out exteriors, and how little pains we take with the interior, because it is all out of sight, and we think nobody will see; but by and by they come to see. This dirt inside is

soaked up, and the body gets saturated with it after while so that it has to push it out and unload it, and then it begins to appear on the skin, you know, and you see dark circles form under the eyes, the skin gets dingy, liver spots make their appearance, and the skin gets brown, and it begins to shade the white of the eye so that it no longer glistens as it once did, but it becomes dingy, and the breath gets bad because those foul vapors are coming out of the body, and they are being formed in the body all the time, and the person gets a terrible bouquet, a veritable bouquet of fecal matter. Now, my friends, it is something awful that we have gotten into this state, and have become obtuse to it, so we don't seem to think we are in any way responsible for it, but we are just as much responsible for it as it would be to allow a dead rat to lie around the pantry, or to allow the whole house to be infested with dead rats and dead cats, down in the cellar, perhaps, --the whole house infected with dead carcasses of things. Even that would not be half as bad as to have these dead and decaying things lying around in their own bodies. Many people actually go around with a whole dead menagerie inside of them. Why, take an inventory of the things, and you would find various sorts of birds, various sorts of rabbits, squirrels, oxen, cows, sheep,--why, the Lord only knows how many different kinds of mammals fish and birds may be represented there at one time. I have seen people sit down at the hotel table and eat the whole bill of fare, and that whole bill of fare represented the whole animal kingdom, the whole animal creation except the insects. They were the only things that were not there. Now, such a state of things is the real cause of the almost universal autointoxication that prevails everywhere in civilized lands, and we are beginning to get our pay; we are getting our pay for it; we are getting a horrible harvest of chronic disease.)(Cancer is increasing at the rate of 500% in 50 years--think of it. Every eighth woman in this audience is going to die of cancer. Every twentieth person in the United States is going to die of cancer,--that awful disease, and it isn't any wonder.

Three times as many men die of cancer of the stomach and intestine as of women. More women die of certain special forms of cancer, but three times as many men die of cancer of the stomach, because they smoke and chew so much tobacco, and drink so much whiskexy and beer. That is the reason for it; they ought to. It kikkxxxkxxx belongs to them because they produce a special form of degeneracy and produce an open door there through which the parasites of this disease, if they are parasites, may enter.

Q. Are the lactic acid bacilli destroyed by the salive if the buttermilk is thoroughly fletcherized?

A. No, no, they flourish in the saliva.

Q. Is there an antitoxic element in fruits?

A. Yes, the acids of fruits will destroy nearly all disease-producing germs when in a pure state. Lemon-juice will kill typhoid fever germs in a few minutes.

Q. Is it advisable to swallow the seeds of cherries, dates, etc?

A. No. There was a man over in Germany, in Berlin, some time ago who had a load on his stomach, and a doctor made an operation, xxxx opened it, opened up his stomach, and found 241 cherry stones that had been lying around there since the fall before. This operation was done in the spring-time, and they had been lying there since the cherry season of the year before, almost a year; so you see what effects cherry-stones have. They are not a good thing to swallow--certainly not.

Q. Why not swallow the residue of coarse vegetables, instead of colax?

A. Well, the residue of coarse vegetables does not have the properties of colax. However, it is a good thing for some people to take the residues of coarse vegetables, for example, lettuce, turnips, carrots, and parsnips, which when well chewed are entirely wholesome except for people who have specially irritable stomachs, or who have dilated stomachs so they have greatly dimin-

ished motility. In such persons the stomach can not contract and carry out this residue, and it is very bad on that account for them to eat; but for the average person with a normal stomach this bulky material is necessary, and it is very wholesome. The bran of wheat, and even whole wheat cooked may be eaten with advantage; and green wheat may be eaten raw. We will have some on the table one of these days and let you try it. I have got my crop of green wheat in the barn, and am going to have it threshed pretty quick, and am going to serve it up to you on the table here, and I think you will find it really quite palatable. There is no objection to the use of these coarse substances, but they are not quite xx equal to colax for the reason that they are not so hygroscopic. Colax has the property of absorbing seven times its weight of water. Colax is simply agar-agar; it is Japanese seaweed; you can buy it for yourselves if you want to at some of the drugstores. They do not have it at all drugstores, but in large drugstores in cities where they keep supplies for bacteriological laboratories, they have agar-agar, and you can buy it. It needs to be thoroughly washed, and disinfected well, because it is loaded with germs from the sea, and it has not been thoroughly washed or disinfected; and then it comes in very long strings that have to be cut up, chopped up, and you can get it into some form so that you can take it; and one should take about two thirds of an ounce a day, about two thirds to three fourths of an ounce a day; and this has the effect to absorb seven times its weight of water, and that makes bulk, and it absorbs the poisons, all the poisons which are in solution in the intestine are absorbed and held, and the intestine acts upon this mass and carries it away; it gathers up as a broom a large amount of xx putrefactive bacteria and carries them away. So it is a very remarkable and a very superior thing.

Q. Is Dewey right in stating that fruits are bad for food as the potassium combines with the acid of the stomach and the fruit acid, and this acid

irritates the stomach?

A. Now, he is not right, because fruits are a natural food for man; but when a person has a chronic gastritis, and a very sore stomach, it is sometimes necessary to avoid, for the time being, the use of acid fruits, for organic acids are often very irritating to a sore stomach. This difficulty is overcome, however, by treatment in a comparatively short time. In a little while, if the stomach is properly treated by the proper diet with bland, simple food, this condition passes away, and then fruit can be used.

Q. Is it true that wholesome foods sometimes when improperly combined produce indigestible combinations?

A. I don't know of any chemical change that can be produced in that way which would produce chemical combinations.

Q. What causes obesity?

A. Too many calories and too little work, too little exercise. I notice one thing quite remarkable. Very fat people generally have an excess of fat around the hips and about the abdomen. ~~You never saw anybody, or~~ they very seldom, ~~with~~ have very fat hands or arms.) There are a few such people, but it is very noticeable that people who are fat have a great amount of fat around the trunk and the hips. A lady asked me that question some time ago,--"Oh, why is It I am so fat about my hips, and my arms are not fat?" I said, "it seems to me you ought to understand that; it is very plain; you spend a great deal of time in your chair, sitting, don't you?" "Oh, yes, I don't exercise very much?" "So you see you do not use these muscles around here, while the muscles of your hands have a great amount of work, don't you see,-an enormous amount of work of this kind keeps them so worn out, you see, that they haven't time to get fat." Well, she took the hint right away, and didn't ask me any more questions about it. Obesity is due to two things--eating too much food, and too little exercise--taking more food than is used. Now, it is exactly this sort of case. Here is a

train of cars going down the track, and it stops at each station and takes on some more coal, because it has been burning up coal since it left the last station. Now, suppose it takes on at each station more coal than it has burned since leaving the last station, what will happen? By and by the tender will be full and it will overflow into the baggage car, then into the smoking car, then the day coach, and by and by the Pullman coaches will be full of coal. The whole train will be full of coal, and then that train is obese. Meal-time is the station where we are taking on the coal, the fuel, for food is fuel; and we take on more fuel than we burn up, than we used since the last meal, and we are adding to our body weight; there is no help for it; it must be so. If the food is digested and absorbed it accumulates, just as coal accumulates on the train. Now, you see, the cure for that is to take on at each station a little less coal than we have burned since leaving the last station; then we begin to burn up some of the coal in the baggage car, and in the day coach, and the Pullman coaches, and by and by the train will be reduced to its normal condition. The body loses its fat by consuming the residual tissue of the body when we are taking less food than we are really using.

Q. Is the book on the stomach which you wrote some fifteen years ago up to date now?

A. No, it is up to fifteen years ago.

Q. What is the graham bread made from?

A. It is made from the whole wheat.

Q. Please explain the cause of acne?

A. Acne is due to autointoxication,--poisons absorbed from the colon are excreted by the skin and irritate the skin glands, and these skin glands, by this irritation, lose their power to resist the germs of the skin, and these germs upon the skin work down into the mouths of the skin glands, and get down inside, and then they grow and multiply and produce poisons that set up irritation;

then there is set up suppuration, and that is acne. The cure won't be found in lotions; ~~it wikk~~x they will give temporary relief, effect temporary cure by killing the germs that are present there; but the trouble is inside. The real cure comes from the antitoxic diet and a normal life.

Q. Can medicine help Bright's disease?

A. Not at all. The person's life may sometimes be prolonged by the use of some medicine which will stimulate the kidney when water has accumulated, about the heart or some other place, and so carry off the surplus liquid; but it does not effect a cure; it is only a temporary lift over the hilltop, for the time being; but it does not cure the diseased kidneys.

Q. Ought one to drink liquid in small quantities or large quantities?

A. Always drink in small quantities. If we take a large quantity of liquid it is poured into the blood very quickly, and the vessels are distended, and can not properly take care of so much liquid at one time, so they pour it out, and pour out too much; and the thing to do is to take a little water at a time, and in that way you can gradually accumulate a large amount of water, but if you ~~shsuld~~ take a large quantity, ~~afxblzadxzalks~~ the blood-cells are over-stimulated and eliminate more water than is taken in. Half a glassful is enough to take at any one time. You can take half a glassful of water at mealtime without any trouble, but a little sip, just a little sip is just as satisfactory as several large swallows. One tan take cold water at meal time if he likes, just in little sips and let it remain in the mouth until it is warm. A little sip of cold water won't do any harm anyhow when it is swallowed into the stomach; it is only taking a very large quantity that does harm.

Q. Why is there so much noise in the main building, especially during the night?

A. We will investigate the matter right away and have it stopped.

Here is somebody who wants somebody to sew on buttons. This is a gentleman's handwriting here; he is looking for somebody to sew on buttons. Isn't there some lady here who wants a job?

Q. Why is it better to wear cotton underwear than wool, when the soldiers in the tropics are compelled by government to wear wool?

A. It is the greatest mistake in the world--this wearing of wool. The reason why wool is considered to be an advantage sometimes, and perhaps is sometimes an advantage, is that it is a poor conductor. It absorbs moisture slowly and holds it a long time. Now, cotton absorbs moisture quickly, and discharges it quickly; so when a person gets to perspiring that cotton garment gets wet and ~~sak~~ then he gets into a little draft or gets into the shade, and evaporation will absorb the moisture and he will be rapidly cooled, and is likely to be chilled; but the natives of the tropics all wear cotton clothing; you never see a native of the tropics wearing woolen clothes. It is really a delusion. The remedy for taking cold is exercise. One may lie down, or sit down in a draft if he likes, but he does not need to take cold. Suppose you are perspiring, and the wind is blowing on you, a strong current, and you begin to feel chilly, you do not need to sit there supinely and take cold. You simply make up your mind you won't take cold, and you need not have any. Just simply say to yourself, "I am not going to take cold." Say, "Now, then, if I were walking around here, I should not take cold. I will just walk around a while." And you don't have to get up to take a walk around. Just sit still there, and say to yourself, "Now, my legs are walking." Set those legs to working, make the muscles contract; draw them up tense just as though you were walking. Set the back of your neck to going. Perhaps you are sitting in church, and there is a sudden draft coming down the back of your neck. And you think first thing, "Now, then I am going to take cold; what shall I do?" Just move your head up and down that way, and the preacher ~~and~~ will think you are assenting to what he is saying, and you won't get

get any harm from it, and he will get a great deal of good.

Q. Is protracted nervous prostration curable?

A. Yes, if you remove the cause. Now, nervous prostration does not mean anything the matter with the nerves. That is one of the worst delusions that has gotten abroad in modern times. I had the pleasure of helping to make neurasthenia. Neurasthenia is a manufactured disease. It is an artificial malady, and I was there and I helped to make it. It was manufacturdd by Dr. George M. Beard, of New York City, and I was taking a post-graduate course, dudying with Dr. Beard, in electricity and various other things, and I took down the symptoms, and I helped Dr. Beard to collect the symptoms, and I made the record while he asked the questions, and when he got a nawxkatxafxqu long lot of questions, then he classified all these questions, and called it neurasthenia. Neurasthenia is a symptomatic malady; it is not a real disease; it is not an entity, like small-pox or something else of that sort; it is a name doctors apply to a statex of things they do not aknow what else to call. When I was a medical student, old Prof. Palmer, professor of therapeutics, said, "Gentlemen, when a patient comes to you and says, 'Doctor, I have got a pain, what is the cause of it?' you look around and say, if you find an abscess there, that it is an abscess; and if you find a tumor growing there, it is a tumor that makes the pain; but if you can't find anything to cause that pain, can not find any cause of it at all, then tell him he has got neuralgia. Neuralgia is the name for a pain that you do not know the cause of, you see. That is the way with neurasthenia. Neurasthenia is a name applied to a group of symptoms that didn't have any tangible cause. But now we know the cause. When a man is suffering and has a great accumulation of poisons in his colon, his body, and his blood is flooded with poisons, and his brain is irritated, and his nerves are irritated, and everything begins to look wrong with his nervous system, and there are headaches, depressed spirits, imability to sleep at night, and the patient is cross and irri-

table and the brain confused, and he has forty other symptoms, the doctor says he has neurasthenia. Now, the proper thing to dy is that he is dirty inside; that he is unclean; that is, in other words, he has got autointoxication. He is intoxicated. And that is the real truth about it. It is no use to say a person has neurasthenia, and then undertake to cure that with medicine; there is no medicine for neurasthenia. Suppose you suddenly hear your telephone bell ring, and you go to the telephone, put the receiver to your ear, and you hear a shout coming over the phone that your house is on fire, and you say, "Oh, dear me, what a troublesome 'phone this is; I will have this 'phone taken right out. I won't have a 'phone that is telling such disagreeable things; I won't have it in the house." Would you say such a thing? Not at all. Why, there is nothing the matter with the telephone. The telephone is simply reporting things. Somebody is kind enough to tell you your hours is afire, and the telephone is not to blame for anything; that ringing of the telephone is a warning that is necessary to help you save your house. Now, my friends, just exactly the same thing is true of neurasthenia. Neurasthenia is a group of symptoms, and these symptoms are reports made to your consciousness by the nervous system. It isn't anything the matter with the nervous system; the nervous system is all right; it is nothing the matter with the telephone. The nervous system is simply reporting the evil state of things. Correct it, remove it, and the evil state disappears. Put out the fire and the telephone stops ringing. Remove the cause of the headaches, and the headaches disappear. Remove the cause of the backache and it disappears. Remove the cause of depression and irritability, and sleepless and they all disappear. So with all the other disturbing symptoms--remove the causesxof them and they all disappear. But we don't have to treat people for neurasthenia. It does not appear on our reports very often nowadays. It used to appear years ago when we didn't know what else to call it; but neurasthenia

very seldom appears on our records any more. I don't think I have put it down in years. It is the rarest thing at any rate, that I ever put that word down, because it doesn't mean anything; it doesn't stand for anything; it is just simply a sort of color. (I heard an old doctor some time ago telling how he lost a patient. He said a lady came to him with her daughter to be examined. He examined the young lady, and he said, "Madam, your daughter is suffering from nervous exhaustion, with nervous prostration;" and hermother said, "Dear me, she does not look very prostrated to me." She was a big fat girl. And she took her down to New York to a doctor there who examined her, and he said, "Madam, your daughter has neurasthenia." She went away and said to her friends, "My doctor at home didn't know anything at all about it; he wasn't up to date. He told her she had nervous prostration, when the New York Doctor said she had neurasthenia." He told her to take her daughter home, keep her outdoors, have her take lots of exercise, and she did so, and the young lady got well. So neurasthenics are simply suffering from autointoxication. They all have dirty tongues and generally other indications of a disordered nutrition. Disordered nutrition is the real foundation of all the trouble.)

Q. How many years are required for recovery from nervous prostration?

A. It just depends on how long it takes to get your forces to working properly, to get the body built up, to get the blood clean and pure. The blood is the healing power in the body; it is the blood that heals; it is the blood that heals. The old prophet said, "The life is in the blood." The life is in the blood. Now, ~~xxsm~~ we know perfectly in modern times that that is true; we know that the blood is the healing power of the body, and it is no use to undertake to heal the body unless we can do it by co-operation with the blood. It is only thwough the blood that the body can be healed. Get the blood right and that heals the body and it doesn't have to have any help. Just get the blood right and it will do the right thing. Now, sometimes we can do a great deal to

help the blood. For instance, here is a part that is weak and has not got enough blood in it. We can get more blood into the part by hot applications. That is the reason why it has been found out in recent times that if a person has tuberculous disease of a joint, by tying a string around above the knee, or a piece of rubber pipe tubing around above the knee and leaving it there an hour or two, twice a day, the knee will be able to get well, because the blood is accumulated. But we have a better way than that. The arc light, and fomentations, and heating compresses, etc. can be made to accumulate the blood in the knew, and the tubercular disease wil be cured by blood being brought to the part. Sometimes there is too much blood in a part, and by cold applications, we can get rid of the surplus of blood. By regulating the blood supply and distribution in various parts of the body we are able to aid greatly in the healing process.

Q. A Radcliffe Dugmore, Chautauqua lecturer, said that the vegetarian tribes of South Africa were the weakest, poorest specimens of the physical type. Please explain.

M. Now, that may have seemed so to him. Of course, a feeble tribe would be a tribe that had not been able to engage in the chase, and was not able to compete with the large, strong animals, could not catch the animals. That is one reason why they take to vegetarianism. But We had some time ago a missionary here from the Congo region, who had lived among the natives for many hears, and who had worked in two tribes, lived among two tribes, and he said to me that one of these tribes were meat eaters, and they were the poorest specimens, the most wretched specimens of humanity he had ever encountered in his life; and the other tribe were non-meat eaters, rarely ever tasted meat at all, and he found them to be large, fine, strong, vigorous and healthy, and prosperous people, as prosperous as savages could be. As a matter of fact, every traveller who has given close attention to the matter knows that the natives of central

Africa eat very, very little meat.

Q. What is the cause of mastoid trouble, and how does it affect the brain?

A.Mastoid trouble is a disease of some cells in the bone points of the ear which are closely associated with the ear itself. When infection occurs there, it sometimes extends into the mastoid bone, into the large cells, hollow places found in it, and when it gets in there some of these cells lying right next to the membrane that covers the brain are affected, so the inflammation easily extends to the brain. Some years ago a man was brought to me with terrible pain in the top of his head, and I cut a little window in his skull, and a couple of ounces of pus gushed out which had been pressing right upon his brain, and the wonder was he was not dead.

Q. Dr. Read says he is too young to remember. Can you tell us what was the cause of the war between the North and the South?

A. Yes, I can tell you as nearly as I understand it. I am not a politician and I do not often answer questions of this sort here, but in my opinion, it was because the constitution was not made right. The constitution was wrong and had to be fixed. I have read Jeff Davis's history of the War, and so far as I could judge of the situation, the position of the South was entirely justifiable from a legal standpoint. (Loud applause). And the constitution of the United States had to be fixed; there had to be an amendment added to it in order to prevent a like occurrence in any future time. That is the conclusion to which I have come from what little study I have given the subject. I don't profess to be a profound student of political economy, but I have simply given you my belief about it. I don't think anybody could read Jeff Davis's history of the war without coming to the same conclusion I did,a-any fair minded person. The fault was with the way in which the states were joined together. They never

had surrendered all their rights. A few states had, but the majority of them had not surrendered. Those who went into rebellion were standing for rights which theyhbelieved they possessed, and which they never had surrendered their possession of. But, of course, I think that we all believe we are better off today as we are in this great strong union, and we will never have another war of the same sort. (Loud applause.)

Q. I should like you to explain the treatment of headaches.

A. Now, it depends on the nature of the headache, and especially upon the cause of the headache. There are a good many different kinds of headaches. Some people have headaches in the tops of their heads, some in front, some in the back of the head, and some have headaches in their backs, away down at the bottom; and these headaches are nearly all toxic headaches, or reflex headaches, nearly all due to those two causes. They are either reflex or toxic. A reflex backache, for instance,--I met a lady today who had a backache, and it was simply a headache down in her back, and she was very much astonished when I called her attention to the fact that the front side of her back was a great deal more sensitive than the back side of it. She thought she must have something the matter with her spine, and because she had a sore spot there. I found the front side of her back was a great deal worse off than the back side of it. Deep pressure showed that the ganglia, the sensitive nerve ganglia in front of the spine were very, very sensitive. This trouble, however, was purely reflex. Visceral congestion was the real cause--neglect to develop the abdominal muscles, feeble abdominal muscles are a very important cause. These muscles not being properly exercised, they become relaxed, and the abdominal viscera fall down, they fill up with blood, and the blood becomes congested, the blood becomes toxic, and the result is inflammations, and chronic congestions, and pains which are reflected. Now, if a man has gallstones and we examine up under the ribs, if we suspect he

has gallstones, we make a little pressure under the ribs here and we find a sore spot, and we always examine behind. The lower dorsal and upper lumbar vertebrae are likely to be sensitive also, because that is the reflex symptom of pain in the gall-bladder. That is the reflex symptom of gallstones, I should say, and of inflammation of the gall-bladder. Now, inflammation of the stomach is felt up here under the ribs at the solar plexus, and the reflex from that, whether it is caused by inflammation or by toomuch acid in the stomach, and so-called heartburn or hyperchlorhydria, is between the shoulders; so each part, each viscera has its spot upon the surface of the body where pain is reflected and developed when there is congestion or inflammation. Now, we must remove the cause in these cases, of the congestion. If it is an inflamed stomach, we will apply treatment to relieve the stomach by proper diet, and by external treatments; then the pain will disappear. If it is due to general congestion of all the abdominal viscera, which is a very common state of things, then we willapply an abdominal bandage, and we will have the patient lie upon his back and raise his legs to develop these abdominal muscles. We will have the patient sit up straight so as to support the viscera and relieve the congestion. Sitting in the chair as many of you are sitting now, is a good way to cultivate congestions and pains, and reflex disorders. Then, when you get up, there you are, in that miserable shape, and the abdominal muscles here are all relaxed and sticking out, and you perhaps think you are pretty stout, when, as a matter of fact, you may not be stout at all. I met a friend some time ago at a medical society meeting,--a doctor walked up to me in the hotel and said, "Well, Dr. Kellogg, how are you?" "All right," I said, "how are you?" "Oh, I am all right only I am too fat. Doctor, I have been thinking about coming down to your place to see if you could not reduce my fat a little." "Oh, yes, "I said, "we can do it." "Can you do it?" "I am sure I can do it." "Well, how long would it take?" "Well, I think I could

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do it in about two minutes." "Oh, you mean to perform a surgical operation?" "No, I am not talking about an operation. I can cure you in two minutes of obesity." I had noticed his coat was hanging straight down behind. He shouted out to the other doctors in the lobby of the hotel--it was at a large convention,-- "Come over here; Dr. Kellogg is going to cure me of obesity in two minutes." So the doctors gathered around and formed a ring. I said, "Look here, Doctor, I am not going to let you see how this is done. Now, look right up to the ceiling. Put your hands on your hips like that,"and he did,"now bend over, keep looking up to the ceiling,--keep looking up; don't look done; keep looking up; now rise up", and I put my hand up upon his back, and he got up there, and there he had rooms to let, don It you know? And I called attention to the fact and I said, "Doctor, the whole trouble is you have been carrying your hips in front instead of behind; that is all the trouble;" and sure enough, the doctor was cured. (Noww, you see it makes all the difference in the world how you stand. Now, when one lets himself down in this sort of way, why the abdominal muscles are pushed out, they relax, they can not support the viscera and the bowels are allowed to fall down, and they are filled up with blood, and everything stagnates there. The splanchnic pool, somebody xxlx has called it, becomes a stagnant pool of blood, and disease is generated, hemorrhoids, and backaches, and a whole lot of things-- headaches, and sideaches, stomachaches too, are born simply with this position. Now, when the chest is raised up that pulls the muscles in and supports the viscera. The chair is an xnx abnormal thing. Man is not naturally a sitting animal. He either walks, stands erect, or else he lies down,xx reclines. Find man in his natural, normal state, and you never saw savages sitting around unless they are sitting down upon the ground with the knees drawn up, and in that position the thighs support the abdomen; but when one sits in the chair and lets himself down, that relaxes these abdominal muscles. Now, gravitation is all the time tugging

away at your stomach and liver and things, trying to pull them down out of place. Gravitation is like sin-pulling us down; so we have to fight it, and we must resist it all the while. Resist the devil, the Bible says, and one has to resist the temptation to relax and to crouch down. It is only civilized races that have these horrible, deformed positions, postures, and forms, and disgraceful attitudes. Savages have self-respect.) I remember a great Indian I saw in the night one time. I was in a wreck out west, in the Rocky mountains, and the train had to wait at a little bit of a station for some hours, so I took a walk up the village street. And it was in the night time, and there was a figure in front of me, and as I walked along in the moonlight, I saw a stately figure moving on very, very stately, moving on in the darkness there, and when I ~~xaxkugot~~ got up to it I saw it was an Indian, a wild Indian with a blanket on. It did me good to see that man walk. He was walking with all the dignity of a king. He used the straight stride, and as he walked along there his figure was just as erect as an arrow. (I was traveling in Egypt some years ago, or in Syria rather, and one day a lon_ line of camels passed our party--myself and my son, and a dragoman, and this caravan of camels went by, and on the top of every camel that went ~~lurching~~ along was an Arab sitting up there as straight as a beanpole, swaying back and forth as the camel lurched back and forth--some of you have tried riding on a camel, and you know what that lurching is,--and they were always erect, never crouching down one instant.) I said to my friend, Mr. Jordan Lloys whom I discovered out there,--I said to him, "Why is it these Arabs are all so straight? Is it natural for them to be straight?" "Oh, no, oh, no," he said, "you ought to be in the encampments as I have been." He had been there for 25 years, and he said he knew the Arab language almost better than the natives themselves. He told me that, sitting around the fire in their camps, just before going to bed, he would hear the old Arab shouting out, "Sit up there, Abraham. Why do you double down like a fool in that hump. Sit up there." He said they were

exhorting the children, and talking to them all the time, and it was astonishing the care they took to teach the children to sit erect. But now we haven't the self-respect the Arab has; we haven't the self-respect the Indian has; we just let our bodies fall into any kind of shape and go to pieces. That certainly is one reason for these backaches and headaches. If we learn to sit erect, we can cure the worst kind of headache by sitting up straight, putting the chest up, taking a deep breath; and you will be astonished if you try it to see how that headache, or backache, or neckache will take wings, because the fresh blood comes coursing down through this congested organ that is making all the troubles, and the blood carries off the internal pain and the exterior pain disappears by magic.

Q. Does eczema suggest a bad condition of the blood?

A. Yes, eczema is often due to autointoxication. It is a lowered resistance of the skin, so that the skin germs which are always with us, take root and grow and develop and produce the disease we call eczema.

Q. Are not the ordinary package crackers preferable to soft breads?

A. Well, those package crackers are made of almost everything except what you imagine; they are made of the poorest kind of flour, the cheapest sort of flour and yeast, and the cheapest kind of animal fat of any kind or any other grease that can be gotten into them and won't taste too bad; so I can not recommend them. You better make your crackers yourself out of flour and water at home, with a little cream. Make it up into a stiff dough, and pound it with a hammer, then double it over and pound it again. Get the hired man to pound it, and it will be good gymnastic exercise before breakfast, and you will have just the nicest sort of bread. I never knew what really good bread was until Iwas down in old Virginia for the first time after the war, and got some beaten bread, and certainly

there is nothing better in the world.

Q. Would it be practical to make scientific tests similar to the one made here several years ago, concerning fruits as food? Have four classes: one drink cold water copiously at each meal; another drink cold water moderately at each meal; another drink warm water moderately at each meal; and the fourth eat without water.

A. To drink or not to drink at meal-time is a much mooted question. Now, must I tell you the truth about that? I stand up here before this question box and endeavor to tell you the truth, the whole truth, and nothing but the truth. We have been making experiments like that over there, and you know we find that when a person drinks gold water his digestion is better. Now, don't you tell anybody about it; but it is an actual fact that we find the digestion is better when cold water is taken with the meal than it is without it. We repeated the experiment a number of times and we are going to repeat it a good many more times before we publish it; but as a matter of fact, so far in our experiments it shows that a glass of cold water taken with the meal--the digestion is better than it is without. S o we may be fanatical on the question of drinking, as I said before; and for many years I have been saying you do not need to abstain entirely from drinking at meals. You need a little water; it is better to drink than it is to feel thirsty, than it is not to drink, especially this hot weather.

Q. Why do horses have cancer if they do not eat meat?

A. It is the rarest thing in the world for a horse to have cancer. Human beings have cancer in proportion of one hundred to 100,000 every year, and horses have been found to have cancer in the proportion of 3/100 of one in 100,000. That is quite a contrast isn't it?--the difference between 100 and 3/100. Horses are almost absolutely free from cancer just as monkeys are, and just as men are

who do not eat meat. In India they only have 3 to 100,000. Dogs have cancer more frequently than men. In human beings the mortality from cancer is 5%. Five per cent of all the people who die die of cancer. That is 75,000 a year in the United States. While in dogs it is 8%. This was found to be true in something over twenty thousand dogs that were six, and were observed--8% of them had cancer. In cats it is 7%. So cats and dogs are more subject to cancer than human beings are, for they eat more meat.

Q. Discuss especially the value of a food in relation to one's fondness for it.

A. Well, if you have been trained to eat pate de foie gras, no amount of training will make it a good thing, for it is not a good thing. If you have been in the habit of using Saratoga chips and think they are good for you because you like them, you are entirely mistaken. You can not make bread out of thistles. A lady in Minnesota wrote me some time ago that she had made a wonderful discovery. She said she had found that pebbles were good, that gravel was good for dyspepsia. She tried it on her husband and it helped him, and she wanted me to try it on some people. I never did. She said it should be not too coarse gravel--just moderately coarse gravel, and she found it worked first rate. You can not settle things by a single experiment, you see; so the mere fact that a person likes a thing and feels better at once after he eats a thing is no proof of its being a valuable food.

Q. How long is it advisable to take the Swedish movements?

A. Keep right on until you feel all right, and get well.

Q. Why don't you get some of the southern folks to teach your chef how to cook rice?

A. I will tell him myself if he doesn't do it right. I will tell you the recipe I got from a southern gentleman, the largest dealer in rice in the

United States, a great friend of rice, and has made a special study of it in different countries, and has traveled abroad studying rice, and he told me the way to cook rice was to put it into a good deal more water than rice, a good surplus of water, and then when the rice just begins to set, to thicken just a little bit, then put in a little lump of butter and stir it up well; then turn off any surplus of water there might be and set it back and let it simmer in a warm place until it is thoroughly done. I have tried that plan and it seemed to work very well. The little bit of fat has the effect to keep the rice from sticking together and forming lumps. I must be honest about it--he said lard; but I don't put lard in any of my prescriptions.

Q. Does meat itself contain germs of disease?

A. Certainly it does, some of the very most deadly germs of disease are found in meat. Some time ago a man put his hand into a lion's cage and the lion bit him. The lion was asleep, and he touched the lion and the lion woke up so fast he was not able to get his arm out of the cage before the lion bit him, and he was taken to a hospital and in three days he was dead, and his body was swollen up so greatly, bloated enormously as a result of the poisons in the mouth of the lion. These germs are very commonly present in meat, and the meat you get at the stores contains anywhere from three millions to 300 millions of these germs in every morsel you take into your mouth. Boiling does not kill them all. Sometimes more are found after cooking than before. When the meat was cooked it simply stimulated the germs to more rapid growth.

Q. Why do you say autointoxication is seldom cured?

A. Because we don't get a chance,--that is the reason. The patient won't stay long enough. The average patient stays at the Battle Creek Sanitarium only five weeks. If we could get him to stay with us three months instead of two weeks and to keep on living according to the Battle Creek idea after he got home, he would keep on getting better, better, better, and better until by and by

he would get well. I am going to send you a circular by and by after you get home to see whether you are keeping in line or not. Take the Battle Creek Idea regularly and read it every week. That will help to keep you in line. I tell you my friends, it pays to be good. I am going to read you here a lot of replies I have received from people who have adopted the low protein idea and are living without meat, and let you hear some of the splendid things.

Q. If one has rheumatism and a chalky substance, is it dangerous?

A. It is dangerous if it is deposited in certain places. That is, if your arteries are hard, then it is dangerous.

Q. What do brown spots on the forehead indicate?

A. Autointoxication.

Q. Is it injurious to take bromo seltzer to relieve headache?

A. Exceedingly injurious. It contains a deadly poison which poisons the heart. I met a lady doctor in Chicago, a very prominent lady physician, seventeen years ago, and she told me about the headaches she had, and said she took bromo seltzer every day for her headache. I told her to stop it, or pretty soon she would get hardening of the arteries, get apoplexy and die. Pretty soon she came to the Sanitarium; I examined her and found she had hardening of the arteries. She said, "Doctor, it has come; what can you do for me?" I said, "We will stop it where it is. You must drop out coffee." "Oh, Doctor, I can't get along without coffee." She went home in a few days. A few months afterwards I picked up a Chicago paper and found a notice that said this woman was picked up on the streets and taken to prison. She was supposed to be drunk, but it was found she had fallen with a stroke of apoplexy. She came here then and stayed a year, and we got her on her feet again; but that disease process had gone so far it could not be stopped, and it proceeded to destroy the brain, that magnificent intellect, and she ended her life under a cloud, and had to be cared for like a child, had to be nursed just like an infant, and she died a year

or two ago a wreck when she ought to have been in the very height of her usefulness, and it was bromo-seltzer that did it; and I am telling you these facts--I am almost ready to tell you the lady's name, but I don't want to do that, because she ought to have known better than do what she did. It is a strange thing that we will sacrifice so much of future advantage and future welfare, that we will sacrifice so much for mere temporary relief. This lady said, "I have got to have something; I have got to attend to my patients; I must get along somehow; so she kept going on day after day hoping she was going to get out of it, when she was getting deeper in all the while.

Q. What are malted foods?

A. Simply foods that have been subjected to the action of the diastase of malt and the starch has been partially digested. While this is true of many foods, many other foods are called malted foods that simply have malt extract mixed with them. Such a food is not really a malted food.

Q. Does the Sanitarium run according to the Battle Creek principles, in Calcutta, India, keep the Battle Creek Sanitarium foods for sale?

A. I don't know that I could guarantee that there is any Sanitarium in India which is run according to Battle Creek Sanitarium principles. There is a small institution there which adopts some of our principles and I suppose is doing the best they can; but the man in charge was not trained here in this institution; he has picked up such ideas as he could, and is trying to come as near to it as he can, which I am afraid is not always very near. They sent over here some time ago a very bright young Eurasian, and he was taken to the food factories here and taught about making foods, and I think they are making some foods there. I have never seen any of them and don't know how good they are. I am telling you just what I know about it, and it is not very much.

Q. Please explain the coefficients of the blood.

A. I will do that with the aid of the stereopticon when we have another

lecture.

Q. Would it be possible for the nicotin from four cigars a week to be thrown off through the skin so as to stain the linen of a moderate smoker?

A. Now that just depends on hos much his kidneys have been damaged. If the kidneys have been badly damaged, it might be.

Q. I attended one of Dr. Kellogg's lectures in the parlor some time ago, and it didn't make me glad to see how my body was being destroyed with germs eating me up.

A. Well, of course, I am perfectly well aware that some of the things I say here are not particularly calculated to make people overjoyous for the moment--just for the moment; but the only reason I speak of these unpleasant things is to warn you, my dear friends, to keep your eyes fixed on the hill-top, and to keep climbing up, to turn away from the city of destruction. I recommend you to read Pilgrim's Progress. He heard that the city was going to be destroyed, and that he better get out of it, and he started on the road to a better place, and he got there, though he had to go through the Slough of Despond before he got there. Now, there is a way out. That is the important thing for everybody to know. The way out is by the natural life, the simple life, turning away from the things that make you sick, and ~~all that~~ cultivate health instead of disease.

Q. Is it absolutely safe to have an operationn performed for abdominal trouble when the blood-test is down to 80?

A. Nothing is absolutely safe. It is better to have the blood pressure higher, but I have operated on many patients successfully with the blood-pressure lower.

Q. Is Colgate's Dental Cream a good preparation for the teeth?

A. I never analyzed it and can't say anything about it. No dentifrice is really needed but water. I never use a thing but water for my teeth. If one

does not eat a whole lot of foul, greasy, dirty things and put them into his mouth, his mouth will nearly keep itself clean. Just a little brushing with a little pure water, and see the dentist once or twice a year, and that is really all the attention the teeth need.

Q. Is it good to eat a piece of water melon for the last course at dinner?

A. Take the watermelon for water, and then it is good. The pulp of the watermelon is indigestible and is likely to make trouble. It is better to reject it and return it to the plate. Take the water, the juice, and return the rest to the plate.

Q. Do you approve of high heeled boots?

A. Yes, high heeled boots are splendid to make a whole lot of business for doctors. If it were not for high heeled boots, we would hardly ever have a case of flat foot; we would never have very many cases of corns, and a great many of the troubles that ladies suffer from we would never have any occasion to treat at all. If you should attend a meeting of a medical society you would hear a very common toast which is, "Woman--God's best gift to man, and the chief support of the doctors." And these high heeled boots help the thing along. There is no doubt about that. Twenty years ago I was in Paris, and I thought while I was there I would buy a pair of French heeled shoes to bring home with me; so I stopped in at the stores but could not find anything. So I said to a good friend of mine who lived in Paris, who had lived there a long time and knew the city very well,--I sent him out, had him hunt a whole day to find a pair of really high heeled shoes, as I had seen many of at home. He could not find them in Paris. A shoemaker said, "You can not buy such shoes as this. You can not buy them in the stores; they have to be made to order. I will make you a pair for nine dollars." I said, "I will wait until I get home, until I get to New York,

and I can get them for $2.50." So I did. I brought home from New York a pair of French heeled shoes. I told the people about them, how Frenchy they were, and explained that I got them in New York for they actually could not be gotten in Paris. It is simply the actresses and disreputable people in Paris that indulge in those enormously high heeled shoes. The French people themselves are too practical and sensible to wear those things.

Q. If you were a patient here and had to go away, what articles of food would you eat from those which are generally set before one in a hotel or restaurant?

A. I don't find any difficulty when I go to a good hotel or a first-class restaurant,--you can always find fairly good bread, and you can have it toasted dry and hard, and you can find either boiled or baked potatoes, and you can always get one or the other for breakfast or dinner, and generally you can get boiled potatoes most any other time. Then you can get some fresh vegetables or some kind of peas, or string beans; and it really is not very hard; you can get some fruit of some kind. When they do not have fruit, I sometimes say, "Now, here, just send a boy out and get some fruit", or, "I will go out myself while you are getting my dinner or--I will go out and hunt up a fruit store, and get a little bag of fruit", and so I do it. By a very little management, one can really get all he needs for health; and it is a good thing to take a few things along with you in the trunk when you are traveling.

Q. What objection is there, if any, to the ordinary white bread which is sold commonly in our cities?

A. The objection is it is so thick the inside of it is not baked. Take some of it out of the inside of the loaf and work it up into a ball, and it will make a very good baseball. Throw it against the wall and it will bound back without hurting the ball at all. It actually won't change its form.

Throw it upon the floor as hard as you please, and it will come up smiling. When you chew that bread up and it goes down into the stomach in the form of little, hard balls, or bullets, or pellets of shot, as hard as a board, it is no wonder that indigestion is caused by it. There are thousands and thousands of people suffering from indigestion as the result of eating this white bread and swallowing it in the form of little pellets.

Q. Are canned fruits such as canned peaches healthy?

A. Yes, they are all right if they are not too sweet.

Q. Is a person who is nervous much more likely to become mentally affected than one who is not nervous?

A. Now, I expect more cases of insanity are the result of brain degeneracy and deterioration of the brain through degeneration than from excessive activity.

Q. What is a traveling salesman to do who ~~lives~~ leaves here and goes forth on the road again where he can not get all the good things you have here?

A. Some time ago a traveling salesman stopped here and he told me how much good he had gotten from Battle Creek ideas. He was a complete wreck. He had been broken down absolutely. He had gotten where he could not do business. He got hold of a copy of our journal, Good Health and red an article on beauty. The article said, "If we want to be beautiful, we must eat beautiful things", and that made an impression upon him so that he began eating beautiful things, and threw away his beefsteaks and chops, champagne and things of that kind, and stopped smoking, and he had made such wonderful improvement that he came to see me, and he said, "Doctor, I am living absolutely on Battle Creek foods. I am a traveling man, but I take them along with me in one end of my sample trunk. I have a partition down in the middle of my trunk, and I put these foods at one end of the trunk." I said, "What do you have in the other end?" "Oh, I have cigars in the other end. I am a tobacco merchant." "Well, what is the result

of it?" "The result of it is I can not smoke my own cigars." I told him I thought he better get out of the business. Perhaps you will be interested to know that man's name is Eugene Christian. You will see his name in the journals som etimes, advertising foods of various sorts. This man got along fine for several years, and continued in business as a tobacco merchant, but carried his foods at one end of his sample trunk, and his samples in the other. I never could have imagined how he could have eaten the food, but he said his trunk was made of tin with a tin partition in the center, so the foods did not get much contaminated with the tobacco.) But ordinarily it is not difficult. (I am going to New York tomorrow evening for a day or two, and I shall put into my traveling bag a box of rice biscuit or two, and I shall put in a few nuts, a little bag of nuts, or box of nuts, and I will put in two or three boxes of chocolates; and if I can not find anything else, I will have some chocolates and some nuts to eat, and that will make a whole dinner. I do not mean Huyler's chocolates, of course. I should hate to try to live on those, because the cane sugar would be injurious; it would be irritating to the stomach; but health chocolates are wholesome, and one can eat almost any quantity he likes, because they are made without cane sugar, except a very little bit in the coating.)

Q. Is buckeye beer a healthful drink? I don't mean lager beer.

A. I don't know anything about it. Ask somebody else.

Q. Why don't you have some real good, genuine corn bread for us southerners?

A. Well, we will inquire about that.

Q. Please explain the alcoholic treatment of tic douloureaux.

A. It is simply injecting the nerve with alcohol. Alcohol paralyzes the nerve, and so stops the pain. It is a treatment that has been used with some success. Cutting the nerve has been also used for the same purpose.

Q. The suggestions about diet tell us to use natural sugar. Tell us

something about it.

A. The sugar referred to here is levulose, but it has been found by further experiments that levulose is not so harmless a form of sugar as was formerly supposed.

Q. Is the use of chewing gum injurious?

A. If it is not injurious it certainly does not do any good. The only condition in which it might possibly be tolerated is if a person had forgotten to fletcherize his dinner, he might retire into some secluded place and chew gum as penance for his neglect.

I thank you for your attention.

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THE BATTLE CREEK SANITARIUM SYSTEM

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, August 4, 1910, at 8 P.M.,

By,

J. H. Kellogg, M. D.

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I am going to talk to you a little while tonight about the Battle Creek Sanitarium System. People come here, I suppose, as they go to most places, with the expectation of being cured of their maladies. Now, the first principle in the Battle Creek Sanitarium System is that disease is not to be cured; that it is the sick man that is to be cured, and not the disease. It is the patient rather than the disease that is to be cured. I remember some years ago reading an article in a Chicago journal in which a man complained that his wife had rheumatism, and he employed a doctor and he gave her some medicines, and she was no better; he employed another doctor who gave her some medicines, and she was no better. He employed a third doctor, and he gave her some medicines, and pronounced her well. In three hours she was dead. The rheumatism was cured, but the patient was dead.

Now, it is not too much to say that "cured to death" might be written upon a large number of the tombstones to be found in our cemetaries. It is a mistaken idea, whether entertained by a patient or by a doctor. I am glad to say that at the present time there could be found very few intelligent doctors who sppose that disease is to be cured. Doctors are coming to understand that better than they did fifty years ago. Fifty years ago disease was fought as you would fight a tiger. The Father of his country was actually killed by the treatment applied to him, in my opinion. He was bled, and bled, and bled until he had no

longer power to resist the disease. It is the body that cures. It is the body that resists disease. The doctor can not fight the disease. The nurse can not fight the disease; it is the body itself that makes the fight, and the body does not fight the disease, but the body fights the causes of disease, and the disease is the fight. The fight is the thing we call the disease. Here is a patient that is fighting against some cause of bodily derangement; he is fighting against the malarial germ, for example. When a man has got infected with a mosquito and he has malarial germs growing in his blood and eating up his red blood-cells at a terrific rate, the man may lose half his blood in three days when the malarial parasites get into it. That is why people get pale so fast--because the malarial parasites eat up half of his blood in three days.

Now, the body makes a fight, and a part of that fight is a chill; and another manifestation of the roar of battle, the roar of artillery is the fever; you can hear it roaring in your ears. And another evidence of it is the sweating That is the method by which the poisons produced by the parasite are eliminated. All of these are simply manifestations of the conflict that is going on within the body, the body fighting against the parasites that invaded it.

Now, suppose you heard cannonading off in the distance, and you heard the rumble and the roar of artillery; suppose you saw the flashes of the guns, suppose you should see the soldiers marching by, and you have all the evidences of battle going on, what are you going to say about it? You will say there is a battle, a battle to be fought, an army to be destroyed, an enemy to be annihilated. It is not a battle to be destroyed; the battle is the evidence of the fight, of the conflict; it is the enemy to be destroyed--not the battle. The battle is the means by which the enemy is destroyed. The battle is not the thing to be destroyed, because when the enemy is destroyed, the battle will be over.

Now, to make it a little more literal, suppose there was an enemy attacking you; suppose we have an invasion from Canada, or the British were coming over here to undertake to a

take our country. I see there are some Canadians here, so I must be a little careful of what I say. Suppose they were coming, and when we were about expecting an attack, you saw the cannon going down the street, and the soldiers drilling, and you see all the evidences of a battle forming, and you would not say, "Oh, this terrible cannon; Oh, these terrible soldiers; some one take these cannon away; somebody destroy them; some one destroy these soldiers", and when you saw the smoke of battle and heard the roar of the cannonading going on, and you knew the enemy were being destroyed by those cannonballs, and bullets being sent through the air, you would not say, "Stop this fighting; stop this cannonading;" but you would encourage it, wouldn't you?

Now, that is exactly what is going on when one has a disease; it is the body fighting against the enemy; it is the body seeking to thrust out of the body something that don't belong there--no matter what it is. Suppose one has an attack of indigestion, as we call it; he has nausea, he has vomiting. He goes to a doctor, and says, "Doctor, give me something to stop the vomiting." He does not want to stop the vomiting; he wants to encourage the vomiting, because there is something in the stomach that does not belong there; there are poisons there, and what you want to do is to get rid of them; and the wise doctor would not give you something to stop the vomiting as long as he saw you were vomiting undigested food and poisonous material--he would not give you somethin g to stop it; he would give you something to encourage it. He would give you water to drink. Probably he would pass a rubber tube down to the stomach to wash it out. Last night I was called up about two o'clock in the morning perhaps, concerning a patient who was down here at the Sanitarium very, very sick, very much nauseated, and everything had been done to stop it; and I said, "Wash her stomach out with the stomach tube", and I learned this morning that within half an hour she went to sleep and slept four hours. Now, suppose I had said to give her a do

give her a dose of morphia or something else, give her something to stop that vomiting; why then all that poisonous material that was making the trouble would have remained there and it would only have been renewed a little later. There ~~xxxxxxxxxxxxx~~ So you see in dealing with sick people, we must first of all consider that disease is not an enemy necessarily; it is not a thing to be fought, to be destroyed, and to be contended against. No, the disease is the conflict; the body is the battle ground, and the body is one party to the conflict. The cause of disease is the other party; the disease itself is simply the battle, don't you see. The disease itself is the conflict. "AH", you say, "but I have got Cancer." Now, is cancer a thing to be encouraged? Does that come within this category just the same as the rest? It is not the cancer that we fight; it is the cause of cancer; it is the thing that makes the cancer, and if we were able to remove that, the cancer would disappear.

You want something for headache. You go to a doctor and get something for headache. Now, we have in the stores what is called headache powders of various sorts. You take one of those powders, and your headache will cease. The headache is cured. You have got a pain in your big toe or in your back, or in some other part of the body, and you go to the doctor and get a dose of morphia or some other anodyne or narcotic, and if you take a large enough dose the pain will disappear. And nothing has been done to effect the cure of that morbid part. Nothing has been done to remove the cause of that pain. You have killdd the pain. If a man is going to have his leg cut off, we give him chlorofocm, and the leg is cut off and he does not feel it. They used to make the man take a drink of whiskey and then cut off his leg; but they found he would be likely to have suppuration in the wound, and the wound would not heal, and he was likely to die; so now instead of making him dead drunk ~~xxx~~ with whiskey, we make him dead drunk with chloroform or with ether, or something instead of alco-

hol. But patients don't do quite so well under anesthetics as they used to do when they were strapped down to the table, were held by half a dozen strong men and the leg cut off without any anesthetic at all. They used to do a great deal better than they did after the anesthetics were invented; but since that time we have discovered asepsis, and aseptic surgery has made it possible to do even under anesthetic things that could not possibly have been done in any other way.

Now chloroform kills pain, but it does not stop the cause of pain. The man whose leg is cut off has the shock; he has the shock--not the moral shock, but the nerve shock; he has the injury to the nerves, has the legs removed, and the tissues cut and damaged just the same as though he did not have the anesthetic. So you see the remedy that kills a pain is only a palliative; it is not a curative at all. And the very same thing is true of almost all other troubles that we talk about. Chronic ailments of various sorts, and a long list of remedies for rheumatism, for example, or for neuralgia, for neurasthenia, for all kinds of nerve troubles, and a vast number of remedies; but we know these remedies do not cure in the sense that they cure the patient and make the patient well; they palliate the condition, make the patient feel a little better temporarily. Now, what I am saying is just as true of Christian Science, and just as true of the Emmanuel movement cure, and just true of everything that does not reach the cause of the difficulty, which does not strike at the root of the trouble.

For instance, here is a man suffering from tapework; he has tapeworm down in his intestines, perhaps, twenty-rive or thirty feet of tapeworm and it is creating irritation , steals the nourishment the man himself ought to have, and creates irritation and reflex disturbances of various sorts are produced, and the man is emaciated. Now, any amount of faith on the part of thatman, if he should go to a Christian Science healer and the healer should say to him, "Now, then, you haven't got any tapeworm; there can not be any such thing as a tapeworm;

tapeworm is an evil thing, and an evil thing does not exist, so there is no tapeworm. Besides, you can not have tapeworm in the intestines, because the intestine is only an idea; and there is no such thing as intestine, and you could not have a tapeworm in the intestines when there is no such thing as intestine; and it is altogether impossible", and you persuade yourself by and by that you do not exist yourself; that you are only an idea yourself, a fancy, and so you could not possibly have any tapeworm or anything that will do you any harm; it is nothing but a bad idea, and all you have to do is to cast out the bad idea. But suppose you should cast out that idea with all the vehemence possible, the tapeworm would still hang on just the same, would still be getting in his mischievous work, don't you see. It would not disturb the tapeworm one bit. If you could exercise some psychic power over the tapeworm and persuade him to let go and depart, then some good would come from it; but unfortunately, it does not go so far as that. Christian Science is only skin deep, so to speak; it does not go down as far as the small intestine.

But now what I am saying with reference to Christian Science is just exactly as true as I said of all kinds of these mind cures methods, including what is known as the Emmanuel Movement.

I was very enthusiastic about the Emmanuel movement when it first begun, but when I came to look into it, I found it was after all simply a modified form of Christian Science, so was really a competitor of Mrs. Eddy under orthodox management, and I lost my enthusiasm. I went to Boston almost with the express purpose of s tudying that system, to see what was being done. I visited their meetings and their seances, and saw the method of procedure, and I became thoroughly satisfied that it was like these other things--superficial, not striking at the root of the difficulty. For instance, I asked one of the attaches of the system there, a student of the system, "Do you cure insomnia?" "Oh, yes,

oh, yes." "How do you cure insomnia?" "Well, we have the patient sit down here, and we say to him, 'Now, then, I am going to put you to sleep. Just sit quietly here; now close your eyes; cast out of your mind all troublesome disturbing thoughts and feel at peace with all the world." A good many people would go to sleep at once if they would only do that. That is what keeps them awake, you know. "Now," he said, "next we say to him, 'Well, you are looking sleepy already, yes, you begin to look real drowsy; sleep is coming, coming, yes, you are getting more sleepy all the time, more and more sleepy; there you are, just going off--just going off--there you are; you are gone; you are asleep now; keep right on sleeping." "Well," I said, "suppose he should open his eyes just about that time." "Well, then, we would have to try it again;" "But you told him he was looking sleepy when he wasn't; you have been lying to him all the while; you told him he was going to sleep when he was not going to sleep. What about all that fibbing; it doesn't seem to me very orthodox to tell a man he is going to sleep, and looking drowsy when he isn't; there is something wrong about it." "Well, we do not get caught that way very often; we generally know whether they are going to sleep or not. It generally comes out that way." "Now," I said, "suppose a man suffering from poisoning--his blood is full of poisons circulating in his body, the poisons absorbed from his intestine--I didn't say autointoxication; I was afraid I might betray my identity, so I put it in rather an awkward way,--"What about that?" "Well," he said, "of course, if he has got autointoxication"--he knew sokething about it I found",--"if he has got autointoxication, why then we will have to eliminate the poisons, of course, before he can be madd to go to sleep." Well, now, that you see is the whole thing. The man can not sleep because he has got autointoxication, and you relieve him of the autointoxication, and he goes to sleep without any Emmanuel movement, don't you see, and the Emmanuel movement can not put that man to sleep when he has got

autointoxication. And it could cure but very few cases of insomnia, because that is the great cause of insomnia--the circulation of poisons in the blood which irritate the brain. I only mention this incidentally.

Now, the Battle Creek Sanitarium system does not claim, as the Emmanuel movement does, to cure; it does not claim to cure disease as Christian Science does; it doesn't claim as any other system that I know of does which claims to cure disease. Scientific doctors nowadays do not make such claims. Scientific doctors found out years ago that it is not the disease that has to be cured, but it is the patient that has to be ured. Sometimes the battle between the doctor and the disease,so to speak, left the patient in pretty bad shape. The disease was cured; that is, all the symptoms disappeared, but the patient was no better, and the patient was even worse. Some of you have heard perhaps of the Irishman who said there was a certain doctor's medicine that he did not like, because it took him so long to recover after he got well; and also of that other doctor that had a patient, and a consultation was asked for by the friends, and they came in several doctors of them, and finally he was pronounced convalescent. One old doctor said, "Convalescent-eI have cured many such cases." Some people have had the convalescence cured, and had the diseases cured until they themselves were left in a very wretched state. It is the body that heals itself; it is the body to be healdd; it is the patient to be cured, and not the disease.

Now, the only thing we have to think about, then, is not the disease, but the patient; what is for the patient's best good, what will enable him to perform his bodily functions in the most proper way; What is the best food for him? What will make the cleanest, and the best, and the most blood, and make blood the fastest, and build up his strength, fortify him, so he can drive out the disease?. And what the doctor can do is simply to bring to the commanding officer, which is the body itself,--bring to this commanding officer the little army of fighters with which the blood is filled, reinforcements, bring in some more arkarxi

more artillery, bring in some more powder, bring in some more guns, bring in reinforcements. That is all in the world the doctor can do; but sometimes he can do something, however, to weaken the enemy; but the body has to make its own fight, and the whole thing, then, is to reinforce the body, to make the blood purer, and better, to increase the activity of the nerve-centers, and to remove obstacles that may be in the way.

Now, I am going to tell you a little of how this system began. In what I am saying of the Battle Creek Sanitarium System, I don't want you to think that this system was invented here; that we have gotten any originality about it, or that it is peculiar to this place; but I want to tell you the principles upon which we do our work, and these principles are in operation in many other places. Every really up-to-date intelligent physician in the world today is working on the same principle.

One hundred and twenty years ago there was born--well, a little more than 120 years ago there was born up in these hills that you see here a very remarkable boy. That boy's name was Vincens; his father's name was Priessnitz. His family had been there, I think, for a couple of centuries in that vicinity. They came from some distant part of the country. This locality is found in eastern Austria, in the eastern part of the Austrian Silesia, about forty miles from the Russian border. In a little stone house, almost a hu,, you might say, there was born this boy Vincens. He grew up without much education, for there were no schools in that country at that time, but he was a boy of marvelous sagacity, marvelous natural wit and natural ability and good sense. I will show you several other pictures of this location.

Here is another picture of Graafenburg. Here is Freiwaldo, the little village you see here in the Graafenburg hills. I visited this place myself a few years ago. Here is Graafenburg,. and here is Freiwaldo. This young man

grew up to be a man, and you see his picture here--Priessnitz--and he set in motion an influence which has been growing, widening, and broadening, and deepening ever since, and that has revolutionized the practice of medicine, and the methods employed in the healing of the sick--to a greater extent than any several other men have done at any other period of the world s history.

Priessnitz when a boy was one day out in the woods and he was hauling logs down the hill, the mountain side, and the horse ran away, the slay ran over him and crushed his ribs. He was given up by the doctor to die. He said he might recover partially, but he would never be of any use to the world. And he could not live but a short time any way. Now, he had been out in the woods before, and had noticed a wounded deer one time come down to a spring and put its foot in the spring. A hunter had shot the deer, and he put his wounded leg down into the water, and he made a great impression upon the boy. And another thing had happened. One day a man had come along and stopped there, a traveling tinker, or locksmith. In those days locksmiths traveled from place to place; there were no local blacksmiths to repair locks and to make locks; they were made by the traveling slocksmiths, and a locksmith came along and in his room early in the morning he heard Priessnitz' father and older brothers talking about a cow that had been hurt, had backed up against a sickle and cut the tendon of its leg down near the foot. They were questioning what to do. This man, the tinker, came out and said, "I can cure her. Give me two little sticks and a cloth and some water, and I will cure this cow." Priessnitz said he had some magic words he repeated by which the cure would be effected. But no one must go along except the boy to carry the water and the sticks. So the grandfather said to Priessnitz, "Now, little Vincens, you go along and listen and hear what he says." So the boy went along with the tinker, and watched what he did. What he did was first of all to lay on the two sticks across the wound, then dip the cloth in the water and wrap it around the

wound and fastened it, and he gave instruction that this should be done three times a day,--that is, the cloth should be wet and put upon the wound. But after crossing the sticks over the wound, he repeated certain magic words, said them over several times, then put on the wet cloth and gave instruction that the wet cloth should be changed three times a day. Then he went on his way, and when he came back at the end of a few weeks, the cow was well. Then they paid him a sum of money to teach Vincent to make use of this secret, so the boy was set up in business as a magic healer.

So when this accident happendd to him about that time, he thought he would apply water to his side, and he got well; so he began from that time on to treat people, and you see here the people coming. Here is the boy treating them. They sat on the bench outside of his father's house. I have been in the very house, and saw the room where the boy was borm; and the people came along with their sores and their lame arms, and injuries of various sorts, and wounds, and he treated them, bathing the parts with cold water, and crossing the parts with the little sticks, and repeating thesecabalistic words; and his fame grew, and went out all through the country there; and he was known as the doctor with the little sticks. And after while he dropped the sticks, made up his mind they didn't do any good, and he dropped them; and for convenience, he used a sponge instead of the wet cloths, because the sponge was a very convenient method of applying the water to the parts; and his fame continued to grow.

There were some other doctors down at the village of Freiwaldo at the foot of the hill who became very jealous of him because he was getting all the patients and they were coming from a long distance to see him, and the place was thronged continually. He treated people free, made no charge, and his time was wholly occupied in treating sick people; so the doctors at this had him arrested and he was thrown into prison and he was tried for using magic. He

was then known as the doctor of the little sponge. So he was tried, and the judge prohibited his repeating those magiz or cabalistic words any more. Then he stopped the use of the words, and his patients got well just as well, in face, he was himself satisfied for some time before that that the magic words had nothin g at all to do with it, but he still repeated the words because they had a certain effect, I suppose, in giving confidence in the method, because the people had not been accustomed to the use of water unless they supposed there was some magic about it and they would not have had any faith in it because it was such a simple thing. It was a part of the Christian Science method that he was using at that time.

Well, as time went on he made a great many discoveries; and this represents the doctor when people were coming from allparts of Europe; and this represents the style of dress that was worn at that time. Some of you perhaps are old enough to remember a style of dress that was not very far removed, so that that was worn in your childhood days; but this was at a period of over 100 years ago.

There were fourteen or fifteen different springs in the mountsins, and I traveled nine or ten miles to visit these springs mysslf. They were very rude affairs. This represents an arrangement made by one of his grateful patients, and many of these fountains were arranged by his patients to be permanently preserved--by patients from Bohemia, and Poland, and Germany, and France, and from all parts of Europe. So each one of the springs is now arranged in this very excellent and convenient way, and the people traveled from one of these springs to another, drinking the water as they went along, then taking the cold baths.

The usual program there was to take a wet sheet pack the first thing on awakening in the morning. About five o'clock the ~~task~~ attendant would come to the room and with

and with a wet sheet wrung out of cold water, would wrap the patient up, and the patient would lie in bed until he sweat profusely. He was wrapped up not only in blankets, but with a big feather bed over him. Feather beds were used, as you know, for bedding in those countries, as covers; and the patient was packed up sometimes under two or three feather beds until he perspired very freely. One patient who visited the place at that time reported that he was very much troubled because the patient above him sweat so hard, the perspiration ran down through the cracks and made a disturbance in the room below and made things too moist for him.

Priessnitz had many very famous patients. Lord Bullwer Lytton, the great writer, was one of his patients, and he wrote a very interesting little book entitled, "The confessions of a water cure patient." Mr. Prang, the originator of the house of Prang, in Boston, the great chromo printers, was a patient there when he was a boy about fourteen years of age. He was also a patient here a number of times, and he told me very much about his interesting experiences at Graafenburg, and he was well acquainted with Priessnitz.

I visited the place myself some eight years ago for the purpose of making myself personally familiar with the scenes of this place of so much historic interest.

This represents a well or spring which was built, it says here, in 1842; and here is the Prussian well or spring built in 1846. That was the time when Priessnitz was in the height of his glory, and people were traveling to Graafenburg from all over the world. A wealthy gentleman from Rio Janiero spent three months crossing the ocean and six weeks more by stage journey to Graafenburg, and he had the first bath, as I described to you, the wet sheet pack in the morning, and after the pack the patient had come downstairs to the great plunge bath in the bottom; and there was a big tank full of cold water which came down from the

down from the mountain side, in winter as well as in summer time--almost ice cold, in open troughs supported in the air, made out of hollowed logs. This water came into the tank at a temperature of forty or fifty degrees usually, and the patient was asked to plunge into that water. This patient from the tropics stood for a moment gazing on that water and refused to do it. His attendant told him he must do it. He finally made a desperate effort to, but found he could not do it; then he turned about in dismay and said, "I will die first", and he went back on the first stage for hime.

This represents some of the methods of treatment employed by Priessnitz. He invented most all of the common, every-day water cure methods that we employ in the use of water. He used various kinds of sitzbaths, and I am going to show you a few of them just as they are pictured, as they were given at that time and as they are given at the present time in this very rustic watering place out there in the forest.

Here is one of the tubs. I took a bath myself in a tub just like that in water that came down from the mountain. It was pretty cold, I assure you. I was glad it was not more than three minutes long. Here is a patient ready to plunge into the cold water. Patients were sometimes required to wear wet clothes. In this case, the whole jacket was wet, the arms as well as the trunk, a flan el jacket was put on outside of it, and the patient was then sent out to exercise until he got warm.

This is the douche. I saw this very douche running out in the forest. It is inclosed, with a big growth all about it; and the men had their douching place and the women had their douching place about a quarter of a mile away. This was about six or seven miles from Graafenburg, and the patient went out there. That was before the peasant proprietor had secured money enough. He began to make moderate changes after while, and he completed a conductor of logs so as to bring the water down to the place where he lived, down to what is now called

the cure. The water comes down here at its natural temperature, which is about forty degrees in winter time.

Here is the wet sheet pack, or trunk pack, as we would all it,--the hip pack. This patient is taking an air bath, you see. This one is having a wet sheet rub. You see the attendant is working good and hard to secure a good reaction. It was necessary to get good, vigorous rubbing, because the water was very cold. This shows the arrangement by which the patient made the application himself. He is applying a spinal pack, and has got several layers arranged of wet cloth, and then the dry ones. Here is a larger pack for the shoulders. Here is one that is arranged for the chest, and has just been applied, as you see. Here is a patient having a douche applied to the side of the face for neuralgia. This patient is having a douche to the legs, and the chest. The water is poured on with a wooden pitcher, you see. I brought home one of these wooden pitchers. This man has had bandages applied in various places for a derivative effect. Really these moist bandages are a very remarkable method of treatment.

Here is the douche. Here the water fell fifteen feet. This was used at the hotel after while. Originally the douchex was out in the country six or eight miles, and the patient had to be transported in ox carts. That is the way they were carried out to get their treatment, and in winter time the snow was so deep the patients were occupied several days in digging the road out to the douche in the open air. With the snow six or eight feet deep upon the ground, the patients took their treatment just the same. You see they really had to labor under difficulties somewhat in those days.

This is the express train going out. This man has been out and had his bath and is on his way back. These obese people, plethoric people, people who were overfed were among the most successful patients in the practice of Priess-nitz. He did not cure all his patients, but most of his patients were of a class

that needed just that kind of treatment. This is the moist abdominal bandage, the umschlaag, or Neptune's girdle. It has been used in Germany for hundreds of years. Priessnitz did not invent all these methods of application, but he found them in use among the peasantry. That is the max remarkable thing about it; and most of these hydriatic methods have been in use among the peasantry in some parts of Europe for centuries, perhaps from away back at the beginning of time, almost. We do not know about that.

Here are some patients walking in the wet grass. Kneippe afterwards borrowed this from Priessnitz. In fact, it had been practiced two hundred years ago in the island of Malta by an Italian doctor who had his patients walk in the wet grass; so it is not a modern idea at all; and most of these modern methods we employ have been used for a long, long time. This patient is having a douche to his eye. Here is a little fountain attached to a wooden tube and a little jet of water running down onto his eye. Here is a very powerful mode of treatment--another douche.

There are really three systems of treatment in hydrotherapy. There is the wet cloth system, in which compresses, packs of various sorts are applied to the body; then there is the immersion system, consisting of full baths and sitz-baths--full baths, etc., then there is the douche system, in which the water in motion is applied to the body, and sprays of various sorts.

All his patients were required to exercise also. Here is a happy family of patients out cutting wood, you see. I have often thought it would be fine if we could get our wood cut and all our work done by our patients as Priessnitz did. The first patients he had paid for their treatment in work on the woodpile and on the farm.

This very old building is still standing. This doctor was able to adapt his system to all circumstances. This was an obstreperous boy suffering from some nervous trouble, so he had a hobby horse for him to ride, and he comes up behind him and douches him with a pail of cold water without

notice, so the little fellow is spared the terror of anticipation, you see. The nurse stands by and really seems to be as much shocked as the little boy, or even more.

Here is the pack applied to the foot for gout. Prëssnitz was very successful in the treatment of gout. He usually began with long rubbing. The patient who was having an acute attack of gout would have his foot rubbed for six or eight or nine hours steadily, with a cloth dipped in cold water; then would have the pack applied. Here is a pack being applied to the abdomen; here is the wet sheet compress to the spine, here a patient having his wet sheet pack covered up under a feather bed, and when the pack is over, he will put be put into this tub of cold water; and here is a sponge and some more cold water to pour upon his head.

When I was stopping in the little bath establishment in Graafenburg, where I stopped over night, in the morning very early, about five o'clock, I heard what I thought was distant thunder; I was awakened by what seemed to me to be the roll of distant thunder, and it continued to roll longer than I thought the thunder ought to roll, and by and by the thunder seemed to be getting louder and louder and louder, and by and by it stopped just at my door. I got up and looked out of the door to see what the thunder was, and I discovered it was a bath tub like that, on wooden wheels, wabbly, creaking wooden wheels, and it had come golling down the whole length of the corridor over the cement floor, and it made a very considerable amount of noise. It did not come into my room, however, but turned into a room across the hall where there was a patient who had been having a pack, and was just to be put into the bathtub. The patient does not go to the baths there, but the baths come to the patient.

Here is a bandage being applied. All sorts of appliances which we use nowadays and consider to be modern inventions, were used in those days.

This is Priessnitz out taking his morning ride. He went on horseback around among his patients, and covered the whole mountainside early in the morning, and was constantly among them. This is the house where Priessnitz was born, and when he was born, the people lived in one end of the house, and the cattle, the horses, the oxen and the sheep lived in the other end. That was the custom in that country. In some places the cattle occupied the whole lower story, and the people lived upstairs. Priessnitz's people were a little better off than some of the rest, so they gave the cattle only one end of the house.

Here is the method of Priessnitz applied to cattle as well as to people. Here is a pig and a cow enjoying a wet girdle, and with very great profit. Here is a horse having a towel rub. The method became very popular among the peasants of that part of Austria; and Priessnitz was very much sought after in the treatment of cattle, horses, and other animals. Here is Priessnitz applying water to cure himself. He had a wounded hand, and he soaked his hand in cold water, then applied a bandage when he was a small boy. Here is another mode of exercise that was very popular with Priessnitz. The patients were required to saw wood. This was an old gentleman who did not want to be seen sawing wood, out behind the barn, so he had the wood carried into his room; and here is a fine lady who is sawing wood, while here is a page you see bringing in the card of some royalfriend who has come to visit her. She industriously goes on with her sawing.

Here are the dumbbells and Indian Clubs that were in use 100 years ago in the establishment of Priessnitz. We haven't got so far ahead of Priessnitz after all. When I visited the great Dr. Winternitz, of Vienna, a few years ago I came in and I said, "Well, Doctor, what is new?" He said, "The only thing we have new is that over there", and he pointed to one of our electric light baths which he had had made and introduced. I said, "But what is new in the use of

water, Doctor?" "Oh," he said, "there is nothing new, nothing really new; I follow Priessnitz." That is what one of the most distinguished scientific men of Europe said to me ten years ago--a man who has devoted his whole life time to the study of the use of water, and has done more to place the use of water on a scientific basis than probably any other living man. He said, "Nothing new; I follow Priessnitz." "Well," I said, "Doctor, what about your methods, improving any?" He said, "Well, there is nothing particularly new about it, except colder water; it is always colder water, and colder water all the time, and more cold water."

This place, I suppose, you have seen before; at least the gentlemen have; the ladies have seen something that looks very much like it. A little bit more fine than the methods of Priessnitz, and yet not necessarily more efficient. Our bath men look as though the low protein diet agreed with them pretty well, don't they? You don't see any of them looking very feeble; yet these young men were living wholly upon a low protein diet during the hard work they do, as all our nurses and attendants do, and all on the low protein diet.

People sometimes say, "Well, is it possible for people to work hard on your diet?" We only ask such questioners to look about at our family of workers here and see if they look as though they were not working pretty hard. And what impressed Professor Fisher several years ago when he first came here was the fact that our workers were so enduring; and that is what led him to make his famous tests by which these young men, among others were tested, made to hold out their arms and go through various exercises, and these exercises were taken down to Yale, and Prof. Fisher went down there, and got the best men in the Yale gymnasium, connected with that place, and he got them to submit to the same tests, and the result was, when it was summed up, in some of the tests our bath men and doctors, and our attendants and workers here, showed that they

had nine times the endurance of those Yale gymnasts. I was immensely astonished. I did not think they would show up as much, because I supposed the gymnastic training would give powerful endurance, but it does not. Gymnastic training gives strength, but it does not increase endurance. Diet is the thing that determines endurance. It is cleanness of the blood, cleanness of the tissues that determines endurance; it is not the size of the muscles; but it is cleanness of muscle that determines endurance. Here are some methods of hydrotherapy as it has been reduced to a science by our modern researches and investigations. Here is a cold douche over the stomach, for example. What for? To make that slow stomach wake up and go to making gastric juice. If cold is applied over the liver it awakens the liver. Every organ over which the douche is applied is powerfully stimulated. There is no known means by which such powerful stimulation can be applied to the internal organs as by douches these cold, or hot and cold applications to the surface, through the associated action of nerves or reflex relationship a very strong impression madeupon the skin is transmitted inward and referred to the internal organ toward which it is directed. The skin over the liver is the place where the liver may be stimulated. The skin covering over the stomach is an association by means of which we may play upon the stomach. The skin over the back is related to the spinal cord. I remember very well a doctor from the East who came here some time ago and could hardly stand upon his feet; he was completely exhausted, but ten days' of cold douches to his spine got him upon his feet so that he felt as well as he ever did in his life. It was simply by awakening dormant energies in the nerve centers that are intact but have been exhausted by work and by the influence of poisons, for he was a great meat eater, and he also was very sedentary in his habits.

Now, this shows cold application to the spleen, for an enlarged spleen. Here is the brain douche, one of the very best means of inducing sleep. The neut-

ral douche at 92° for three or four minutes is a most effective soporific,and very few patients who are sleepless will be long going to sleep by such an application.

Here is a sponge bath--water applied with a sponge in large enough quantity to flow down over the body when the skin is vigorously rubbed. Here is a preparation for a wet sheet rub, and here the patient is having a hot pack by means of the electrical blanket, the photophore, or thermophore. Here is a wet sheet rub. The sheet is wrapped around the patient, and the patient is vigorously rubbed. This is one of the inventions of Priessnitz. It is just as good now as it was 100 years ago, and is used most effectively as a means of relieving internal congestion.

If a patient has a congested stomach or liver, or there is too much blood in his head and not enough at the surface, give him a vigorous rubbing and the blood vessels of the skin are filled with blood, and the internal congested parts are relieved. The relief is partly chemical through the vital reaction of the vessels and nerves of the skin.

This patient is having fomentations to the spine. The hot application made to the spine diverts the blood into the skin and relieves the congested spinal cord. The old method was fly blisters. The fomentation has the advantage over the blister that when you apply the fly blister once, you can not do it again. But the fomentation can be applied several times a day, and with better effect every time than before. The body responds better to each successive application made.

This is the preparation of the fomentation. It takes two persons to apply a hot blanket pack. Here is the foot bath. The feet are placed in water that is very hot and kept there until they become thoroughly red, and that relieves not only the feet, but the brain is relieved; the foot bath is used for de

derivative effects. I was up an hour ago in the surgical ward where I found a lady suffering severe pain, a patient I operated upon yesterday had a severe pain in the region of the stomach where I had performed the operation. I said to the nurse, "Give her a hot footbath." And I have not the slightest doubt she was relieved; I have not heard a word since about it, and I think she must have been relieved.

I remember some time ago I performed an operation upon a patient in which I had to remove a large tumor, and there were adhesions everywhere, and the doctor who brought the patient here said, "Now, Doctor, you will give her some morphia won't you?" "On, no," I said, "she won't need morphia." "What? she won't need morphia? But how will she sleep without it?" I said to him that we would be ready to give her morphia if she needed it, but she would not need it. We called in the next morning together to see how the patient was. "Well, how did you sleep last night?" "Oh, very well, Doctor." "How long did you sleep?" "Six hours?" "Well, did you have some medicine?" "No, no medicine at all; natural sleep." Now, the application she had was simply hot applications to the feet and legs. The hot blanket pack, and sometimes the footbath will do the same thing.

When I was a boy I was raised in hydrotherapy. My mother was very skilled in the use of water. That is the way I happened to be a Sanitarium doctor. My mother learned about hydrotherapy when I was a very young baby, or before, and I was, as I said, brought up in it. When I had the measles, I had wet sheet packs from the bottom of the coldest well to bring out the measles; and it did bring them out well, and it brought me out too; I didn't want any more for some time. And we had a shower bath in our house where everybody could get a cold shower bath if they wanted it. I didn't always want it. I rather confess I rather had a prejudice against very cold water. But I was brought up

to understand the use of water and that it was a marvelous source of relief from disease and pain. I remember when I was a boy about thirteen or fourteen I had a terrible toothache. I think it must have been what the boys sometimes called jumping toothache, for it seemed to come in jumps. The pain was so terrible it seemed I could not endure it a moment, and I could hardly restrain myself from screaming. I hurried down to the kitchen; I knew there was a big boiler and plenty of hot water, because the hot water reservoir at the back of the stove was always full--the sort of stove used in those days, and I got out some of this hot water into a tub as quick as I could, and got my feet into the tub, a common wash tub, and my toothache was relieved entirely in less than five minutes. I went back to bed and had a good night's sleep.

That experience made a great impression upon me, and when I find anybody suffering pain, I resort to the use of heat.

Here is a sitzbath. This is a very hot footbath, and the sitzbath may be cold, or cool, or hot as required; but the footbath is always hot in every case, according to what is wanted. For internal troubles such as rectal troubles, hemorrhoids and things of that sort, there is nothing so wonderfully effective as this cool sitzbath. The temperature of the bath at the beginning will be perhaps about 80°, which is about the temperature of the sea when you go in for a swim on a warm summer day; but it is gradually cooled more and more and more until by and by it will come down to ordinary pipe temperature,--60° perhaps, then it may be continued ten or fifteen minutes. Nothing is so good to relieve portal congestion. The liver and bowels are wonderfully relieved by this simple means; prostatic troubles, and pelvic troubles of all sorts are wonderfully relieved by this sedative sitz-bath. If it is painful trouble, sometimes cold water is the last thing to use; it should then be hot water. If it is sciatica, the ordinary sitzbath very hot is a marvelous means of relief. I remember find-

ing a man in Portland Oregon some years ago, a friend of mine who was suffering from frightful pain, from an abscess, and I got him into a sitzbath, and had the water madd hotter and hotter and hotter, and it got so hot he said, he couldn't stand it any longer, and he said, "Doctor, won't you put in some cold water now?" Ti said, "Well, it is too bad to have it so hot isn't it", and I came along with some more hot water, and so kept on enticing him along until the water was so hot he declared he could not stand it a minute longer, and I begged him to wait just a little longer, and so coaxed him along until when he got out of the bath he looked as though he had been stewed; he really looked as though he had been boiled, for he was red as a boiled lobster. But the pain was gone. That was tight or ten years ago and he has never had a pain since in that region. He has written me many times since thanking me for that hot application. If you get a pelvic pain, or a toothache pain, or an old chronic pain of any sort, it is marvelous what relief is given by hot applications. The hot fomentation is good, but be very careful not to get chilled. Sometimes a full bath is necessary. The whole body must be immersed in the hot bath in order to get the proper impression.

The reason of the cure is that heat antagonizes pain; heat kills pain by removing the cause of the pain.

Here are some more applications being made. Here is a hot and cold renal compress. This is a bag of cold water or ice placed over the lower end of the sternum, and this is a hot application around the body. This is for external congestion of the kidneys. The kidneys have a skin center at the lower end of the sternum as well as over the kidneys. The kidneys have two skin centers, one at the lower part of the sternum, the other over the kidney itself. A hot application is put over the kidney, and the ice bag over the end of the sternum. The ice bag acts reflexly while the hot application acts derivatively.

Here is the wet girdle, one of the most effective means of inducing sleep. When placed around the body in this way it diverts the blood from the

head by drawing the blood into the abdomen. Some of you will say, "The best way to get me to sleep is to give me a good, hot meal." That is very well, but you will go to sleep and sleep two or three hours, then you will wake up and won't xkm feel comfortable. You can't sleep the rest of the night. The reason why you go to sleep after eating is because food brings blood into the abdomen, and that diverts blood away from the brain; but if instead of putting food into the abdomen, you put on the moist girdle on the outside, that draws the blood into the abdomen and does not produce any irritation.

Here is the indoor swimming pool. Swimming is one of the most effective baths I know of; it is a valuable means of developing the chest, and the breathing muscles at the same time that the skin is subjected to the action of the cold water.

Some of the different procedures, as you see, are of very great value, especially in certain cases. Here is the mechanical Swedish movements, an outgrowth of the old manual Swedish movements. The vibration is particularly effective, because this can not be executed with the hand so effectively as it can by machine. The vibrating bar is a capital means of stimulating the nerve centers. If one feels tired and weary and takes hold of the bar and gets a good shaking for a little while, the weariness disappears. That is one of the most effective means of relieving the tire and fatigue of the neurasthenic. A lady said to me today that a good many of our patients complain of being tired because we work them so hard, they have so much to do. That is a sham weariness, not a real weariness. It may be overcome by very simple means. Now, when a person feels that way if he will go down into the Mechanical Swedishmovement department, and take hold of the vibrating bar, or the vibrating belt, or the vibrating chair or some other of these effective measures,--have the vibration itself applied to the spinal cord by the vibrating dumbbell, it is marvelous how quickly that weari-

ness will disappear. I have tried it myself when I have been just almost at the end of my rope with exhaustion, and it is simply wonderful what relief is obtained by this very simple means.

Here is the manual Swedish system. I want to call your attention to this sturdy figure of this man here. You see him here again. This young man is now a physician. He is in Germany, in Berlin taking postgraduate studies, and he is a graduate of our college here. This young man came here from the South Sea Islands where he had been spending some years. He went out from home an invalid, and had been sick all his life, and traveling for years after health. When he got here we found he had tuberculosis, and before our attention was called to his case, his disease was so far advanced that I sent him to Colorado, and really never expected to see him again; but I met him there some months later, and found him in a very feeble state, just able to walk outdoors and a few rods up the hill behind the house. A year later I saw him again in Colorado, and I found he could not only walk well, but he could climb the highest mountains around the place; and in another year he was well, and he got well on a low protein diet. He came back, finished his medical course, and the last time I saw him he was a most magnificent specimen of manly vigor. He was able to start right off and run twenty-five miles at a rapid gait without stopping once, before breakfast. He was able to lie down upon his back and raise his legs a thousand times, once every five seconds. He had acquired prodigious strength and vigor, and he never ate an ounce of meat or took any high protein diet of any sort, but lived upon the simplest Sanitarium food during the entire course of his treatment, and made, as I tell you, a most excellent recovery.

A lady arrived in the house here some time ago, who previously was in a hospital in New Orleans. She had been a patient here before, and she happened to drift into a hospital there, and the doctors found this brown pigmentation of

the skin, and it was such a curiosity that all the doctors of the hospital came to look at it, it was such an extraordinary thing. Some of you have seen it before. This was a case in which pigmentation was particularly marked as the result of the application of the photophore. That indicates increased activity of the skin which is only an indication of the increased activity taking place inside. The stomach, bowels, liver, and all the internal organs are stimulated by the same sort of increased activity that makes this increased pigmentation of the skin; so this is simply a sign on the outside of what is taking place inside.

But I have talked to you long enough tonight. I want simply to impress upon your minds, my friends, by these pictures, and the remarks I have made, the fact that the Battle Creek Sanitarium is a method of natural cure; it is not a method of curing disease, but it is a means by which the sick man can be trained into health, can be trained out of invalidism into health; and the most important thing of all is to learn how to keep well after you get well. I wish you good night; I thank you for your attention.

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D I G E S T I O N

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, August 11, 1910, at 8:00 P. M.

By,

J. H. Kellogg, M. D.

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Ladies and gentlemen: we are going to have a lesson on digestion tonight. We will have a regular, old fashioned district school. I propose to teach you so that you will know every one of you the process of digestion, so it won't simply be a great mystery to you any more, but you will really understand it. It is not a very hard lesson. We can learn at all in ten or fifteen minutes, I think, if we all give good attention, and I am going to ask you to recite in concert. I am going to tell youfirst, then ask you to say it back; then you will be more likely to remember it, as you see.

Now, in the first place, digestion relates to food, so we must know something about food before we can understand anything about digestion. There are five different elements in food concerned in digestion,--five different substances in food that are concerned in digestion. No, there are three great food elements or principles,--fats, starch, and albumin. Or, to put them in better order, starch, albumin, and fats. Starch, albumin, and fats--those are the three great food principles. Now, there are two more which are subordinate,--sugar and salts. These are the things which must be digested in the alimentary canal. I am going to say it again, and then we will all say it in concert if you will. Starch, albumin, fats, sugar, and salts. Now, you notice the thumb may represent the starch. That is the biggest, the chief element of our food,--about ⅘ of it is starch, or .6 of it is starch. Albumin is the most important element

of our food. That is, we can live without any of the others, but we must have a little albumin; that is essential. That is the first finger. Fats may be represented by the middle finger, the big, fat finger. Sugar and salts come next. Salts are the least of all, and that is the little finger. Now, we can remember by association. I am talking partly for the benefit of these boys here, because I see they are taking notice; so if I make these boys understand and remember this subject of digestion, I can be sure that the oldest inhabitant will catch onto at least something. Now, we are going to say it altogether. Starch, albumin, fat, sugar, and salts. Well, I declare,--you all got it. This is the brightest class I have had in a long time.

Now, we have five different digestible food substances. Now, to digest these various digestible food substances, we have five digestive organs--the mouth, the stomach, the liver, the pancreas, and the intestines. The mouth is the first, the starting point; the stomach comes next; the liver is the biggest one of all. It is a great, big gland that weighs 3½ lbs, and the pancreas is not so large as the liver--is a little smaller, and the intestines are the last of all. Now, I wonder if we can all say that. I am sure those are all familiar to you. How many digestive organs are there? Five. How many digestible food substances are there? Five. Now, let us say these five digestive organs--mouth, stomach, liver, pancreas, intestines. Good. Now, there are five digestive juices. Each one of these digestive organs makes a digestive juice which transforms, changes, the food and makes liquid of it, and renders it absorbable; changes it into another substance; that is, it acts upon some element of the food, or elements. Now, these digestive fluids are five. There are five digestive organs, five digestive fluids, and five digestible food elements. It all goes on the rule of five, you see. That is pretty easy, isn't it?

Now, the mouth makes saliva. We all know what that is. The stomach

makes gastric juice. We are all familiar with that. The liver makes bile, or gall, as it is sometimes called. The pancreas makes the pancreatic juice, and the intestines make the intestinal juice. Now that is easy, isn't it? The mouth makes saliva, the stomach makes gastric juice, the liver makes bile, the pancreas makes pancreatic juice, and the intestines make intestinal juice.

Now, how many digestive fluids are there? Five. Let us see if we can remember them. What does the mouth make? Salive. What does the stomach make? Gastric juice. What does the liver make? Bile. What does the pancreas make? Pancreatic juice. What do the intestines make? Intestinal juice. That is easy isn't it? That is just splendid. Now we have got the raw material and we have got the machinery to digest it, and we have got the chemical fluids which do the work, and ow let us see what is done. What is the first digestible food substance? Starch. And we have more starch in our food, that is if we eat natural food, than anything else. About a pound of starch a day the average man requires when he eats natural food.

The saliva acts upon the starch and converts it into sugar. That is a great reason, boys, for chewing your bread for a long time, isn't it? because there is a great deal of starch in bread, and if you chew it a long time the saliva will have a good chance to digest the starch and convert it into sugar. Every boy likes sugar. If your folks do not get you all the candy you want, you can manufacture some for yourself, don't you see, quite independently; you can make your own sugar. All you have to do is to get a chunk of bread and chew, chew, chew it a long time, and it will be sugar; the longer you chew it the more sugar you will have. The saliva converts starch into sugar. That gives a suggestion too, doesn't it? that when we eat our oatmeal and rice flakes we do not need to put so much sugar on them, because they are all going to be converted into sugar. All we need to do is to chew it and that saves the expense of the sugar.

The average American, according to this year's census report, eats 82 pounds of sugar a year--just think of it--a quarter of a pound of sugar every day the average American eats, and it is not good for him. There are several reasons, but we won't stop for that now, however.

What is the next digestible food element? Albumin. The gastric juice digests albumin. The white of egg, for example, dissolves and disappears. The white of egg is albumin. If you swallow lumps of hardboiled white of egg into your stomach, those lumps will after while disappear. If you have some gastric juice and put it into a little bottle, and shake it up with some bits of white of egg, after while it all disappears. That is the way we test the gastric juice. Some of you have had test meals and had your stomachs examined, and you have noticed the figures. After the word "pepsin," the amount of pepsin, the peptic digestion, you notice the figure three, four, five, or six or something. Now, the way that figure is obtained is this: Some white of egg is put into a very small glass tube and heated until the albumin is coagulated, hardened so it is white so you can see it. Then a little piece of that tube about an inch long is put into some stomach fluid that you have furnished, after it has been filtered one of those little tubes is dropped into it over night, and in the morning it is taken out, and the albumin has been digested out of the end of it; then they measure the tube to see how far it has been eaten out, how far the tube is emptied on the end, and that indicates how active the gastric juice is. In twelve hours healthy gastric juice ought to digest one sixth of an inch. That would be four milimeters; and the figures if you have four put down, that means four millimeters or one sixth of an inch, and that is normal gastric juice; but now if you have only three instead of four, that does not mean ~~xxx~~ three fourths the normal, because it goes by squares. It means nine-sixteenths. The comparison would be between the square of ~~three~~ and the square of four, or nine and sixteen.

That is, three millimeters means only about half as much digestive power as you ought to have, and two means only a quarter, because the square of two and the square of four would be four and sixteen; and that would be one fourth the gastric juice you ought to have.

The saliva digests starch and the gastric juice digests albumin. Now, what is the next digestible food substance? Fat. Give me an example of fat. Butter is fat; olive oil is fat too; and cream is fat, has a good deal of fat in it at any rate. Now, the bile digests fat. The bile makes soap out of fat. You know,--I don't suppose these boys know anything about it, but when I was a boy about the size of these boys here, one of my duties every morning was to carry out a pail of water and put it on a barrel of ashes down behind the barn, and there was an old iron kettle set down underneath the barrel of ashes, and when the water went through the ashes it was black, dark colored, and they called it lye, and when there was an accumulation of lye, then we had soap-making, and some fat of various sorts, scraps of fat were put into a great big kettle, and melted, and the ~~kimmxx~~ lye was put in and all mixed up together, and we had soft soap, and that is what was used for washing. Now, when the fat had the lye added to it it would dissolve in water making the soapsuds, as we call it. After we added alkali to it, then it would dissolve. Before it would not. Now, the bile makes soap out of fat--the cream, butter and the other fats we eat, no matter in what form, when they come in contact with the bile, when it is poured into the upper part of the intestine, a soap is formed, and in the form of soap the fat can be absorbed into the blood and can be circulated through the body, whereas otherwise it could not be absorbed. So it is absorbed in the form of soap. It has taken many, many years to find that out, but within the last few years, within a dozen years that interesting fact has been discovered--that the fat is assimilated in the form of soap; so the bile is a great economy.

It is interesting to note that the bile is made out of the residues of the body just as the lye used to be made out of the residues from the stove; so the ashes of the body are are used by the liver and converted into bile, and the bile is a sort of lye that contains the alkaline wastes of the bodyx which, combined with the fat, make soap, so is useful in the body. It is also an excretion.

Now, let us see; we have disposed of three digestible food substances--starch, albumin and fats. Now, what is it that digests starch? Saliva. Starch is digested in the mouth by the saliva. What does the saliva convert the starch into? Into sugar. Now, what is the next digestible food substance? Albumin. Where is it digested? In the stomach. What digests albumin? Gastric juice digests albumin. It dissolves white of egg and meat. When one eats lean meat it is digested in the stomach, dissolved in the stomach; it is the duty of the stomach to dissolve it. That is why the dog can swallowki his meat without chewing it--because the gastric juice is able to dissolve the meat completely without chewing. The carnivorous animals do not stop to chew their food; they simply chop it up a little and swallow it in boluses; and some people try to do the same thing, and it does not work very well, because it sticks in the throat, and chokes the person; and besides the human stomach is not so good a digestive agent as the dog's stomach is; that is, it has not so strong gastric juice as the dog's stomach does; consequently it is not adapted to digest meat in that way, and if the meat is swallowed in lumps, it may take too long a time to digest it.

What is the next digestive substance? Fats. How are fats digested? By the bile. What does the bile do to the fat? It makes soap out of it. How many digestive fluids are there? Five. What are they? Saliva, gastric juice, bile,--we have disposed of all them haven't we? Each one digests one digestible food substance. Now, we come to another, and what is the next one?

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The pancreatic juice. Now, you know, this is a very interesting thing. The pancreatic juice does not take up a new digestive substance; it does not digest sugar, and it does not digest salts; perhaps it has something to do with the salts but that is not its special business; but the pancreatic juice goes back and does over what the other digestive fluids have done. It digests the starch as the saliva does, and it digests albumin as the gastric juice does; and it digests fat as the bile does. The pancreatic juice is the Hercules of the digestive fluids, so to speak; it is the most important of them all; it does as much digestive work as all the rest put together. It is wonderfully versatile--like a jack of all trades, like a man who is a blacksmith, a farmer, and a carpenter all at one time. The pancreatic juice digests starch, and digests albumin, and digests fats. Now, it is worth while to remember that, isn't it? So if a person should get anything the matter with his pancreas, he would be likely to be pretty bad off. You can see why that is. Now, we can remove men's stomachs--as I had to do a while ago. I have got a collection of stomachs in bottles over in the museum over here; and I met a man on the porth a while ago and said to him, "Mr. Jones, how are you getting along?" "Oh, fine, Doctor, fine; I have gained 17 pounds with mystomach in a bottle." That was a very dramatic way to put it wasn't it? I never had had such a reply as that from a patient before, and it was really very pleasing that he had gained 17 pounds with his stomach in a bottle. Evidently he had changed his idea about the stomach. He supposed the stomach was very essential to digestion, but he had gained 17 pounds in a few weeks without his stomach. At any rate, he had nothing but just a little bit of a stub of stomach left, just enough to hitch the intestine onto. Now, why could he gain seventeen pounds with his stomach in a bottle? Because he had that pancreas left, which was making that wonderful digestive juice which can digest starch and albumin and fats,--all of the important food elements. It can do all the work that the saliva and the gastric juice and the bile do and do it better. It

not only does all that the saliva does and that the gastric juice and that the bile do, but it does this work a great deal better than all of them do put together can do.

Now, one can get along without the stomach, but he could not get along without the pancreas, he could not possibly live without the pancreas. One can get along without the salivary glands, can get along without his mouth even, so far as digestion is concerned. We had a patient some time ago who had cancer in the upper part of his stomach so he could not use it, so we had to make an opening into the intestine below the stomach, and he was fed into that opening through a tube. And he got on fine. He was happy as he could be. He was glad to retire his stomach from business for it was giving him so much pain. We see, then, that the pancreas is the most important organ, and it does three times as much digestive work as any other digestive fluid does, and does it better.

Now, we have two other digestive food elements, what are they? We have only talked about starch, albumin and fats. The next one is sugar. You wonder what is done with sugar? Now, there is not very good provision for the digestion of sugar. Sugar is digested in the small intestine, and there is not so good a provision for the digestion of sugar as there is for the digestion of other substances. Here is starch, for example. Starch is digested in the mouth by the saliva, and it is also digested by the pancreatic juice. Here is albumin which is digested by the gastric juice. How else is it digested? By the pancreatic juice. Fats are digested by the bile and by what else? By the pancreatic juice. Sugar is digested how? By the intestinal juice. It has only one chance for being digested, and that is down in the intestine. Now what is the reason for that? Why do you suppose that is? It is a very interesting thing. When we eat sweet fruits with the exception of the date, the sugar which we eat is already digested and does not need any digestion at all. The

sugar of grapse, for example, when you eat grapes the sugar in thsse grapes is ready to go right into the blood and be assimilated at once, and there is nothing in the world the body can do to make it any better. It is already for immediate use in the body; and if we should take the sugar out of the grape and inject it right into the veins, it would be used; it does not require any digestion at all. That is the nature of sugar, you see. Now, that cane sugar does differently. Cane sugar must be digested, and cane sugar is digested only in the intestine and it is only three or four hours after the food is eaten that the cane sugar begins to digest at all. Immediately after eating, and for three or four hours th there is nothing at all don e to that cane sugar. There is no provision for digesting it; it has to come later, about four hourse after the sugar is eaten. So it is a little risky business--eating cane sugar, isn't it? We may have to wait three or four hours; we have got to wait anyhow three or four hours for it to be digested, and in that time it may be fermenting and making trouble. Where is the sugar made that we make in the body? We make it out of starch, Where is it made? In the mouth if we chew long enough. If we fletcherize thoroughly and masticate the food thoroughly, then sugar is made in the mouth by the conversion of starcy by the saliva into sugar.

Now, this sugar that is formed in the mouth by the action of saliva upon the starch is a peculiar kind of sugar; it is maltose. Now, it is not maltese, boys, it is maltose. Maltose is malt sugar. Now, this malt sugar is the native sugar of the body; it is malt sugar which also can be put right into the blood and it will be assimulated and used without any further change at all. When the saliva converts that starch into maltose, it is then ready for immediate use. But it is changed usually when it is being absorbed, in passing through the intestinal membrane in the process of absorption this maltose is converted into fruit sugar--the same kind of sugar you find in fruits. There are two kinds

of sugar in grapes--dextrose and levulose. These sugars are found in almost all fruits, and this levulose is converted into dextrose in the process of absorption so it is only necessary to be absorbed. But this is not true of cane sugar. Cane sugar must be digested by a special ferment, sucrase, which is not present when we eat cane sugar, but is only formed three or four hours later. As a matter of fact, we do not have the power to digest cane sugar very well. The ferment sucrase by which it is digested is not always formed; there is not enough of it to digest all the cane sugar, so the sugar makes mischief. So you see it makes a difference what kind of sugar we eat.

There are several different kinds of sugar. I wish we had time to talk about them, but we have not. Honey is fruit sugar. Honey is more digestible than cane sugar, more digestible than syrup. If we are going to eat something on our breakfast cakes, something sweet, we better use honey rather than maple syrup because maple syrup is cane sugar, and molasses and syrups of all kinds are cane sugar, and they are not readily digested, and they are irritating to the stomach and really are not really a very wholesome kind of sugar. They do not occur naturally in our natural foodstuffs. Cane sugar is found in grass, in cornstalks, in sorghum, and the sugar cane, in the sap of trees, and the leaves and twigs of trees; but it is not found in fruits except in the date, and in the date it isa mistake; it is an accident. That is the way it happens to be there, becaused in the normal date, in the thoroughly well developed and healthy date, there is no cane sugar. The cane sugar is digested in passing from the sap of the tree into the date in the process of ripening; it is converted into fruit sugar; but there is a certain substance added which seems to be a sort of monstrosity, deformity, deficiency at any rate; it does not get the power to convert that cane sugar into fruit sugar as it passes along, but it passes right on**xxxxxx** and is deposited in the fruit. There are only a few species of dates of which this is true.

The majority of dates do not have cane sugar. But instead, we have fruit sugar, again,--dextrose and levulose which are already prepared to be absorbed, at least by the body, and require no digestion whatever.

Then there are the salts which are digested by all the digestive fluids. Some of them are soluble by alkaline fluids of the mouth and the intestine, and some of them by the fluids of the stomach, the acid juice of the stomach; and those that are soluble by either one of these fluids are dissolved.

Well, now, we have gotten over that step I think very quickly. Let us see how much we remember of it.

How many digestive food substances are there? Five. Recite them. Starch, albumin, fats, sugar, salts. How many digestive organs are there? Five. The mouth, the stomach, the pancreas, the liver, and the intestines. How many digestive fluids are there? Five. The Salive, the gastric juice, the bile, the pancreatic juice, and intestinal juice. That is splendid. Now, what does the saliva digest? Starch. What does the gastric juice digest? Albumin. What does the bile digest? Fats. What does the pancreas digest? Starch, albumin and fats. What does the intestinal juice digest? Sugar.

Now, let us take it the other way. How is starch digested? By the saliva in the ~~mmm~~ mouth.And by the gastric juice in the stomach? No, not at all. The gastric juice can not do a thing to starch. Fat is digested where? By the pancreatic juice and the bile. This is simply a little didactic instruction so you will understand the pictures. How is albumin digested? By the gastric juice and the pancreatic juice. How is fat digested? By the bile and the pancreatic juice. How is sugar digested? By the intestinal juice. And how is starch digested? By the saliva ad the pancreatic juice. How are the salts digested? By all the digestive juices more or less. Now, that is not such a complicated thing, is it? That is all the subject of digestion, the chemistry of it.

But now, there is another very important chapter, and that is the

the mechanics of it. The mouth is the mill. We must go a little further back. We must begin with the act of prehension. The hand is the feeder. A lady said to me some time ago that she was enormously fat, and she said, "Oh, Doctor, I wish I could reduce." "Well," I said, "I think we can do it." "Oh, why is it, Doctor, that I am so fat around in here when my arms are not fat, and my hands are not larger than those of other ladies?" I said, "Don't you see, that is very plain. You sit a great deal, don't you?" "Yes," "Well," I said, "don't you see your arms and hands have a great deal more work to do than the rest of your body, you see; they work so hard; that is the reason." Now, she took the hint right away. "Oh, I don't eat much, Doctor; I am not a large eater. Nobody would call me toolarge an eater." I notice that all very fleshy people say that; they think they are under suspicion because they are so fleshy, and they must be good eaters. It happens sometimes that very fleshy people are not large eaters, but they have an idiosyncracy in that direction, and those cases are very hard indeed to rduce in flesh; but the majority of people who are too fat have at some time in their lives been too large eaters, have got themselves up to great size, and even though they are not large eaters now, they maintain their weight. Now, in order to lose flesh we must eat a little less than what we calculate is really necessary to keep us in equilibrium.

We have put down on every bill of fare here the number of calories that each dish represents. You will find it very profitable for a time to figure up every meal to see how many calories you have eaten. Some of you will say, "I know I am not gaining flesh at all." It is your own fault. All in the world you have got to do to gain flesh is to eat more calories. If you eat 2500 calories and digest it, you are absolutely certain to gain. If you do not ~~eat but 1500~~ need but 1500 and you are eating 2500, you are just as certain to gain half a pound a day as can be, and you can not help it. If you do not work very hard, and

just go on as you are going, just holding your own, and you add a thousand calories, you can not helpbut gain about half a pound a day. If you are too fleshy, if you weigh 250 when you ought to weigh only 150, you can cut your bill of fare right in two in the middle and eat largely of lettuce, spinach, turnips, and fruits and things of that kind; and don't drink too much water at mealtime, but drink a great deal of water at other times.

Now, this matter of prehension is important, you see, because the quantity of food is highly important, and for a good many other reasons that I haven't time to mention here tonight. One thing particularly, however, that over-eating is almost certain to lead to intestinal autointoxication through the putrefaction of the unused foodstuffs, but after the food has gotten into the mouth, then it i is a matter of mastication. The mouth is the mill. I was talking with a gentleman from Australia the other day who had a big ostrich farm and about a thousand ostriches, and he tells me those ostriches go around and pick up small cobble stones and bits of glass and all sorts of things, and if an ostrich is killed, sometimes they get to fighting one another and are killed off,--and then examination shows those pebbles are all ground down smooth in the interior of the ostrich. The ostrich does not chew things; it simply swallows them. Whatever he eats, when he eats it he simply swallows it down, and it is all ground up down inside.

Now, we haven't any machine of that kind for grinding up; we haven't any mill in the stomach. Some of these boys have eaten chicken sometimes, but they are never going to do it again, I am sure. Did you ever see a chicken's gizzard? It is a kind of mill isn't it? It is a thick, strong muscle, and the chicken does the same thing the ostrich does--swallows pebbles and little things and the food is ground up by those pebbles. It is a curious thing isn't it, a very curious arrangement. The chicken has no teeth, so swallows teeth. I remember a man who came to me some time ago and declared he had swallowed his false

teeth, he thought he had, because they disappeared over night, and he forgot where he put them. When xxxxxx I was studying medicine at Vienna some 27 years ago, with Prof. Schrader, the great throat specialist there, one of his assistants told me he had a man come there who said he had lost his teeth and could not find them, and they looked down his throat and there were his teeth. It was not a big, full set, you know, but it was simply a small plate with four or five teeth on it, and it had actually been swallowed and gotten down into his larynx. They got it out for him.

Now, we haven't any mill anywhere else in the world except the mouth. Here is our mill; here are the teeth, and there is the place where the food must be ground; and if it is not ground right here where it enters the body, it never can be ground, because the stomach has no teeth, and it does not need pebbles in it; it has no means for grinding; so the food lies there a long time. If the food is reduced to a liquid state in the mouth, then when it goes down into the stomach the gastric juice can mix with it quickly and find the albumin in small particles and digest them quickly. You know, if you have a great, big lump of ice, it takes it a long time to melt. But suppose that lump of ice was all shaved into fine shavings and spread out, it would melt quickly wouldn't it? If you put those shavings into a tub of warm water they would melt in a hurry, would not they? But if you put the big lump in it would take a long time to melt.

That is the way it is with the stomach exactly, and with the food. If the food is well chewed, xxx broken up into fine particles, then the gastric juice and the saliva xxxxxxxx can come into contact with all the particles of food right away, xxxxxxxxxxxx the bile with the fat, the gastric juice with the albumin, and the saliva with the starch come in contact with those elements immediately so the digestive process is carried through quickly, because the transformations are produced at once; whereas if the food is swallowed in lumps,

it lies there in the stomach. The saliva can not get at the starch inside of the lump, and the gastric juice can not get at the albumin inside of the lump, and the bile, when it gets down into the intestine can not get at the fat; so it worries along, worries along, and it stays in the stomach longer than it ought to stay; a large quantity of gastric juice is poured out in the effort to dissolve it, to digest it, and then the person gets sour stomach because he has too much acid in his stomach, and if that person goes on year after year, by and by ulcers will be formed in the stomach, and the gastric juice is so strong, so irritating that it attacks the stomach itself and makes ulcers in the stomach; and down in the intestine portions of food which ought to be digested and absorbed in the upper part of the intestine are carried on down into the colon where no digestion can take place, and where none does take place to amount to anything; and there, the undigested food, not being absorbed, undergoes putrefaction, so we have fermentations, and the formation of gastric gas and putrefaction, the formation of very obnoxious poisonous substances--skatol, indol, pirrol,--most horrible, ill-smelling substances which are absorbed into the blood and thrown off throughthe lungs, producing bad bratth, producing fetid excretions from the skin, producing a malodorous state of the body because the whole body is saturated and some portions of the food remnants are converted into coloring material. There are 30 different kinds of substances formed, some of them poisonous substances, and various coloring matters are formed, and they get into the skin, and make liver spots and moth patches and dingy skin, leathery skin, and great brown circles around the eyes, and specks before the eyes, and the dingy sclerotic,--these are only a few of the symptoms.

Now, this same dirt that gets into the skin and makes the skin dirty not on the surface but in the skin--it is a dirt that is more than skin deep; it is in the muscles, and the brain, and throughout the whole body. Sometime

you go down to market and you see a quarter of an ox hung up there, or a cow it may be, and you notice that it is a golden color. That is because that cow had jaundice when she died, had gallstones, just as like as not. They are very likely to have gallstoned. When I was in Paris a few years ago, in the market there, I saw one part of the market where they sold meat, they had very carefully preserved a whole lot of gallstones. I said, "What are those things?" They told me they were gallstones. So I bought a few for half a dollar, and brought them away and brought them home with me. Gallstones are gathered up by the Chinese in this country, I understand, and sent back to China where they are considered a very valuable medicine. This flesh was stained, you see, by the bile. Now, you see a person that has jaundice, his skin is yellow, but not only his skin, but that whole person is yellow. I have seen post mortem examinations on persons who died with jaundice or cancer of the liver, or some other part of the body, and the brain is yellow as the skin, the mucous membrane is yellow, and the entire body is yellow with the bile.

The same thing is true of the person who has loafing bowels,--the dark circles around the eyes, and the dinginess extends throughout the whole body, and that is why such people feel depressed when they get up in the morning, and feel as though they had committed the unpardonable sin and are going to be hung, or murdered or something. That is what gives so many people the ghastly brass-like color of the skin; the poisons hide the natural color, obscure it. With proper diet, with the proper amount of exercise, with proper treatment, copious water drinking, living naturally, these poisons are burned up, excreted and eliminated, especially when the antitoxic diet is ~~dexed~~ adopted. You see a man in training for a prize fight, the boxer, and when he is ready for his match, unless he is a negro which would of course be different,--but if he is a white man his skin is clear. When a man is ready for a fight, the trainer says he

is in the pink of condition, that his skin is as white as a woman's; it is as clear and free from blemishes; and that man's whole body is as clear and clean as his skin, because of his vigorous exercise, copious water drinking, and training and natural, simple lift has been brought up to the very pink of condition.

Now, that is the way we ought to live all the time. And you see a person going around with this tawny skin, dirty tongue, foul breath, malodorous exhalations from the body--why that person's body is a perfect Golgotha of dead things, of rubbish, remnants of decomposing putrescence scattered all through the body; the body is stained, and the blood is spoiled with it; every tissue is poisoned with it, and the wonder is that we can live under such conditions. It is almost a resurrection to be lifted out of such a state, and that is what the Battle Creek Sanitarium is for--to promote people out of this slough of disease--for that is exactly what it is,--up onto the Pisgah's top of health; and it is by a process of right living, of clean, wholesome living.

Now, I have just been showing you how it is that improper mastication of food leaves it in lumps so it can not digest or be absorbed and utilized, and it gets down into the colon which becomes a sort of garbage box for the body; and there it lies, seething and putrefying, sometimes for days; but I must come to the end of this story some way, and I want to show you some pictures. The first thing I know the clock will be striking nine, and I see some of you want to get off to bed.

This is the lungs. Air is necessary for digestion, for the digestive process requires oxygen. That is one reason why people who live in the open air have such good digestion--because they take in so much oxygen. That is one reason why consumptives get well when they live outdoors,--because digestion improves so much; and what is good for consumption,--the outdoor life, and outdoortreatment is just as good for every other chronic disease that is known--is just as good.

Here is the heart that circulates the blood after and the food after it has been digested; it circulates the blood around through the digestive appar-

atus. Here is the diaphragm that rises up here, and the stomach lies right underneath. Now, when the diaphragm contracts, it comes right down upon the stomach and gives the stomach a good, hearty squeeze, gives it a little kung hug to send it along. These are some unhealthy lungs, consumptive lungs. Here is a thyroid gland up here. The salivary glands are located just above. I think my assistant made a mistake and thought that was the salivary gland. That is the thyroid gland and it sometimes gets enlarged and makes trouble.

Here are the lungs again with a better view of the diaphragm. Here is the thyroid gland again. Here is the middle lobe. This is somewhat enlarged. We have to remove it sometimes when a person gets exophthalmic goiter. We can take off one of these lobes or two of them. This is the pyramidal lobe, as it is called. Here are some tubercular glands bottom side up. This is the minute structure of the kidney. We have got everything here but the digestion, haven't we? Here is the colon, but the picture is bottom side up so we do not see much of it. Here is the cecum very much enlarged. I was operating yesterday and I found two cases in which the cecum was so big it went clear over here. It ought to stop up here. The appendix is away up underneath here. The cecum is enlarged and projects over the appendix, covers it up; and the colon is enlarged lengthwise as well as laterally. Here is the transverse colon dropped down in the middle. The sigmoid flexure here is bulged upward. In such a case as that it is no wonder the patient has difficulty, because the intestinal contents are retained, and this great reservoir is nothing but a pouch, and has not power to overcome this pouch, and sags down in the middle, and the great wonder is such people do not suffer more than they do.

Here is another case even worse. In such cases, sometimes this loop gets twisted and then there is still more serious trouble than before.
Here is the stomach turned up so you can see the pancreas underneath. This is

the pancreas that makes the pancreatic juice, and it pours the pancreatic juice into the intesting right here--the duodenum. This is the bottom side of the stomach; it is turned up. Here is the pylorus, and that is the muscle through which the food passes out.

Now, here we have some blood-vesself. These are white blood-cells, and they are increased in number after digestion. We have more after digestion than we did before. That is why we take the blood-test between twelve and one, before dinner; then we get the normal condition. After dinner it is increased, and the reason why the blood-cells increase after dinner is because they swarm out into the blood for the purpose of catching the bacteria which are always through into the blood from the intestine. The circulation is increased, and there is a larger number of bacteria in the blood, so we need more blood-cells. This shows how they get out sometimes to catch the bacteria. Here are red cells moving along the center of an artery. Here are the white blood-cells moving along down the walls, and here they are coming out, you see. Here is one that has made a little gimlet and bored a hole through the wall and is going through. This one has got partly through; this has got clear through, and it is catching a germ. This one has got two germs and is digesting them. This is partly digested, you see. Here is another one catching a large mouthful. You see they go right after the germs and capture them. That is one of the most wonderful things of which we know anything--the pursuit of germs by these white cells. A white cell is nothing but a transparent jellydrop one 500th of an inch in diameter. It would take 500 of them to make a row an inch long. They are pursuing those germs. They haven't any teeth or any stomachs, but they make a mouth or a stomahh out of any part of themselves anywhere, for they are all stomach and all mouth.

And this is to illustrate what a wonderfully intelligent thing the intestine is that we have been talking about, that makes the gastric juice.

This shows where a baby has swallowed a stickpin; and there it is, sticking into the small intestine, and if it goes through there it will make trouble and mischief, because it will be infected, so the baby is likely to die. But it is not going to do that, because the minute it sticks into the intestine, the intestine thickens up, you see, and gets thicker and thicker and thicker, so the pin can not get through, and the intestine begins to push it up on this side to catch it, and it gets up and so is captured like that, and begins to be pushed over, and after while it gets pushed clear over there; and now that pin is going down head foremost, donstream, and is not going to do any harm at all. Now, isn't it a wonderful thing--the marvelous intelligence of ~~this~~ this intestine? And the intestine will do that without any nerves from the brain at all, because we are not directing anything about it; it is going on when we do not know anything about it. I could not give you this on my own authority, but Prof. Roger, the great French scientist who succeeded Prof. Bouchard, a member of the French Academy, and professor in the Medical School of France,--he has published this account, and he has discovered this by his observations on dogs and other animals, and he has published a full account of it in one of the recent books he has published on intestinal digestion.

Here is a little table I would like to have you look at a moment to note the digestibility of various foodstuffs. Alexis St. Martin was a man who had a serious accident one time when out hunting with a gun loaded with buckshot. Perhaps he was going to shoot ducks--I don't know; but anyhow when he was carrying his gun along, by accident, on getting into a boat or something, his gun was discharged close by his body here and tore away the front of his body and made a large hole in his stomach, as big as your hand, so one could look in and see the inside of the stomach, and the lungs moving abd the heart beating. He was put under the care of Dr. Beaumont, the Company surgeon--up in the Straits

of Mackinaw, the northern end of Michigan where this happened, and the Doctor took care of him, and to his astonishment the man got well, but when he got well, the edges of the opening in the stomach grew fast to the edges of the opening in his skin, so he could look right through the hole into the stomach; the stomach had a window in it, and he had a great deal of trouble. When he ate his breakfast it got away from him, so he had to wear a little pad over that window, but by and by Nature was very accommodating, and grew down a little curtain inside to shut the window, and that kept the food from coming out. Dr. Beaumont hired him to live with him as a servant, and he saw it was a good opportunity to make experiments, so he fed him different articles of food, and after feeding the food he could, with a little glass rod lift up the curtain and peep in to see what happened to that food; so he studied and watched for months and months, and even for two or three years, and he worked out this table. This table is chiefly the result of Dr. Beaumont's labors. He published a little book which has been long out of print, but was one of the most interesting documents ever communicated to the world, on the subject of digestion, and it was all the information we had until very recent years, as to the time required for the digestion of different foods.

Now, he found that rice disappeared from the stomach in an hour,--the most easily digested of all foods. That is why we recommend rice biscuit and rice flakes. We have found, as a matter of fact, that in experiments with the stomach tube, in our laboratory, that the rice flakes disappear in half an hour. In from thirty to forty minutes they disappear--even in less time than ordinary boiled rice, because the process of digestion is partly done. Now, here is sago which disappears in an hour and 45 minutes; tapiocca, two hours; barley two hours; boiled milk two hours and 15 minutes; venison broiled--we will pass that,--we will hurry by that. Roasted goose 4 hrs. 30 min.--but we will hurry by those things. Soft boiled eggs 3 hours;hard boiled eggs 3 hrs. 30 minutes.

Of course you are not interested, because you are not going to eat any of those things. But whipped eggs, an hour and 30 minutes; boiled trout an hour and 30 minutes--surprising, isn't it?--salmon four hours. Oysters two hours and 55 minutes--only lacks five minutes of three hours. Stewed oysters three hours and thirty minutes; lean beef three hours; rare, roasted lean beef three hours; lean beef fried four hours; salted beef four hours 15 minutes; roasted pork five hours 15 minutes. That is why the lumberman likes it so well; he likes fried pork that sticks by the ribs you see. He says that because it stays right up there in the stomach under the ribs and does not digest. Roast mutton, fried veal, broiled fowls,--that means stewed chicken, boys,--roast duck four hours 30 minutes--just think of it. Melted butter, three hours and 30 minutes. Cheese--"a mighty elf, digesting all things but itself"--but it does not digest anything or itself either,--three hours and 30 minutes. Marrow bone soup four hours and 15 minutes. That is not pea soup such as you had for supper, but marrow bone soup. Animal fat is hard to digest. Bean soup does not digest so quickly either, or chicken soup. Boiled beans two hours and 30 minutes. Sour apples, two hours; sweet, raw apple, an hour and a half; boiled cabbage four hours 30 minutes; raw cabbage, two hours and 30 minutes. Why is it the boiled cabbage digests with so much greater difficulty than the raw cabbage? Because it is hardened, the tissues are hardened by the process of boiling.

Now, remember that rice digests in one hour. Now, here is some wheat showing how it is made. Here is the bran, and that is where the gluten is. Here are the gluten cells right around here. The inside of it is mostly starch. So the graham flour is better than the ordinary flour--the whole wheat flour--because it contains the gluten and the protein which is a natural food element. I think we have perhaps finished our subject, and we will let you go and give you the rest of the pictures at another time. I thank you for your patience.

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STEREOPTICON LECTURE

At the Sanitarium Parlor, Battle Creek, Mich., Thursday, August 25, 1910,

At 8:00 P. M.,

By

J. H. Kellogg, M. D.

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I have a few pictures I am going to show you first tonight, and than I will talk to you about them afterwards. A man asked me today, "Doctor, why don't I get well faster?" "Well," I said, to him, "How long have you been getting sick?" "Well," he said, "I think about twenty years." "Well, now, "Isaid, "getting sick is like sliding down hill. It is like going down a toboggan slide; it is very easy to get sick, but getting well is like climbing a hill. No wnder it goes a little slow. We have got to climb all the way back." When one gets sick with measles, whooping cough, chicken-pox, or anything of that sort, he catches it from somebody else, and he is not to blame for it, but when one gets sick with dyspepsia, or arteriosclerosis, or some other thing of that kind, that is a thing he has made himself; he has cultivated it; he has no one really but himself to blame. Of course, he did it ignorantly. So of course when one has been cultivating sickness for a long time, and hiswhole body is in a deranged state, it takes a long time to get back again. A man who has neglected his business until his business is in the hands of a receiver, and he is bankrupt, it takes a long time to rebuild his credit; it is exactly so with health; just the same thing exactly. We have a few moving pictures we are going to show you that we made on the spot. Our photographer made the pictures, and we are going to show them to you.

This first picture is of Mr. Horace Fletcher. He is taking off his clothes and he is going to climb up a ladder and pretty soon you will see what

he will do. Mr. Fletcher, sixty years old, got out on the end of this plank, and now you will see what he did; you will see him turning a sumersault. He is pretty lively for an old gentleman, isn't he? Here is one of the boys. I don't think he will do it any better than Mr. Fletcher did. Mr. Fletcher said he used to do that when he was a boy, and he didn't know whether or not he would be able to do it now, but he did; he found he was able to do it just as well as when he was a boy, without any more difficulty.

This is one of the gymnasium teachers from Yale University. Here is Mr. Fletcher making a bow. Here are the young lady members of the physical culture training school, and the young men are up on the wall ladder, you see, going through their gymnastic performances.

I don't know of any exercise that is on the whole so healthful and so upbuilding to the body as swimming in water at the right temperature. We consider our outdoor gymnasium one of the most important features of our institution. I think a large share of chronic invalids who come here would get well if they built an outdoor gymnasium at home and spent half the time every day in it, then would eat right, and I think those two things would cure almost all the chronic invalids that come to us. There are a few that are so bad off they need to have something more done. The fact is that right living will cure almost all the ills we suffer from, will cure them all if we take them in time; but we generally wait until it is too late.

This is rescuing a drowning man. They have pulled him out of the water, carried him ashore and now he is being resuscitated. The way they are going at it, I should think it would be almost as dangerous to be resuscitated as to be drowned. The first thing, you see, is to get the water out of his lungs and out of his stomach. It is worth while to make an effort even if the person has been under water for half an hour. There are cases on record in which person now

sons who have been under water for half an hour have been resuscitated later.

Here are the manual Swedish movements. They seem to be in something of a hurry to get through. The exercises are taken so rapidly they will, of course, accomplish very little good, because they are supposed to be accompanied by breathing movements. I notice a general expression of sympathy on the part of the audience. Some of you know just how it feels. This is the half-sheet rub. It is a wonderfully invigorating measure. It is a good deal better than doses of strychnia, or quinin, or any other medicinal tonic. The purpose of this is to produce a reaction in the skin. It brings the blood to the surface of the body, and thatk draws it away from the brain and the spine and the liver and other internal organs, and when that is repeated, given day after day for a long time, the blood is by degrees fixed in the skin, the vessels of the skin become larger so that they hold more blood, so that the blood has a better disposition in the body, and internal congestion is overcome.

This is the towel rub which accomplishes the same thing as the wet sheet rub, or the half-sheet rub, only it is a plied to a smaller surface at the same time. These measures are so simple that they can be used at home. In many parts of Germany the peasants are all familiar with the use of water. In fact, that is where the water treatment originated. These methods were most of them in use among the peasantry of Germany more than two hundred years ago, and Priessnitz, simply systematized and utilized methods he found already in use. John Wesley, the founder of the Methodist church, more than 200 years ago recommended the use of these simple measures, fomentations, compresses, the cold bath,--he recommended them very generally in numerous troubles. For instance, in a case of ricketts, he recommended that the child suffering from ricketts should be "dipped in cold water every morning immediately on rising, and new dipped every morning." The child should be "new dipped every morning", he said, in a tub of cold water, and at the end of a year the ricketts would be cured.

There isn't any better remedy known at the pesent time, except the regulation of the diet ant ~~shx~~ the cure of autointoxication which is the cause of ricketts probably in the great majority of cases.

Now, this is a very simple plan. You see the thing is to wring out a towel and apply it to an arm or a leg, or the chest, the back, and to give the part a vigorous rubbing, and then afterwards a drying immediately, until the surface becomes red and warm; and so the whole body can be gone over. In any case of heart disease or kidney disease or lung disease, to immerse such a person in cold water would be dangerous, because the blood is driven in from the entire surface; but even in such cases, in cases of very feeble persons, a small portion of the skin can be wet with cold water and rubbed, and when reaction is produced we may proceed to another part and do the same there.

Some years ago I was talking to about two or three thousand people in a western state, and talking to them about the simple methods of treatment, and I asked ~~xxx~~ them if some of them had not had some experience with them. A man got up and said at once, "I would like to tell you how I saved my baby." So he told the story of how that one night his baby was awfully sick, and almost died, and how he resuscitated his baby and saved its life. The baby was very sick, ~~x~~ had been sick for some time, and was getting feebler, became unconscious, and he rode eleven miles to find a doctor, and the doctor said it was no use for him to go. It was nine o clock at night at that time, and the doctor told him the child would be dead at midnight. So he went back home very sorroful, and told his wife what the doctor said; but they did everything they know how, but nevertheless, along about twelve o'clock, he said the child began to breathe feebler and feebler, and within a short time the child was apparently dead. Its face was ashen gray, and its lips were blue, and its heart ceased to beat, and he put his ears to its chest and said to his wife, "The little one is dead; I can not hear the heart beat." And just then a thought struck him, and

he seized the child, and said to his wife, "Bring a pailful of cold water quick;" and he held the child up and his wife threw the pailful of coldwater on the child, and he took a deep breath, and has been breathing ever since. This man was by instinct led to do the very best possible thing that could be done under such circumstances. Water is a powerful tonick, and when it is applied in this way the liver is stimulated, the heart is stimulated, the lungs are stimulated to greater efforts. You know if somebody should drop a half a glass of ice water down the back of your neck, you know what would happen to you, and you probably know what would happen to them too, if a person should do such a thing. The very first thing that would happen would be a very deep breath. One involuntarily takes a deep breath. Sometimes you get up on a cold winter morning in a cold room, and you take a deep breath involuntarily; you can not help it. That is because the cold stimulates the lungs and stimulates the chest. So cold applied to the body in this way produces deep respiration and pumps the blood out of the liver, and the stomach and other internal viscera so the liver the stomach and all the other internal organs are stimulated to increased activity. Now, this cold water is turned upon the feet so as to prevent the rush of ~~xxlxxwaxarblood~~ into the head and to produce a strong reaction.

Now, these pictures that have been shown you here illustrate two things,--first, Mr. Fletcher. I want to tell you a word about him. Mr. Fletcher twelve years ago was such an invalid that he was given up as an incurable case, and he could not get life insurance. The life insurance companies refused to take any risk upon his life. He had evidence of Bright's disease, and other serious troubles. He began to look around to see what he could do. The doctors did not do him any good, he said, so he thought he would see what he could do himself. He said to himself, "Now, there is one thing I can do. I can select the proper food, and then I can chew that food properly; and when I have chewed the food and swallowed it, then my responsibility ends. I can not do anything more about

it; I can not digest it." Some of you know that from experience. He said, "I will take pains to do all I can myself right. I wi l select my food properly as I know how, then I will chew it well" and he began to take the greatest pains with mastication. He chewed the food thirty or forty times. He had heard that Mr. Gladstone instructed his boys to chew each morsel of food forty times, and he told a friend of his, or he was told by a friend of his who at one time had sat at a table with Mr. Gladstone, and he observed Mr. Gladstone actually chewed a morsel of food fifty two times; so he was satisfied that Mr. Gladstone was really sincere about that and the story was true. Then he chewed his food 100 times, and finally got up to ~~a~~ 300 times each morsel 300 times; but he found that was rather impracticable. It took too long to eat, really he had to spend pretty nearly the whold day at it; but he tried that only as an experiment, and very soon gave it up. But he after while discovered that if he took pains to chew his food, he did not have to count the number of chews; the thing worked automatically, involuntarily. After while, when the food was thoroughly reduced, there was a sort of suction down at the back of the throat here, a sort of suction that pulled the liquid part of the food down into the throat and carried it away while that portion that was not liquid was held back by the tongue, pressed against the roof of the mouth. I am telling you his experience so that it may help some of you in learning to chew, for neglect to chew is one of the most common errors I know of in connection with eating--is neglect to properly masticate the food. Really one has to give some attention to the matter. If one really attends to the matter, gives thought to it, and chews industriously, one can chew a whole meal very easily in twenty minutes; but he must pay attention to it; he must work hard at it, and lose no time. He must see that every motion of the jaws is a movement in chewing, so that the food is keep in the best place for thorough mastication all the while. He can not be talking and chewing, and giving attention to everything else besides mastication, and at the same time

chewing his food in a thoroughgoing way; he must really give some thought and attention to it. But it is not necessary for one to chew every moment, in sitting at the table. One does not have to work at the masticating problem all the while. He can stop now and then for a little conversation, but when one is conversing, he should not be trying to converse and chew at the same time. One should not be putting food into his mouth and trying to talk at the same time he is trying to chew. He will do one thing of the other very badly. It is quite likely the chewing will be neglected. He may swallow the morsel of food half chewed, or choke it down like a pill, and he will have to take the consequences. Every morsel of food that is swallowed without being properly masticated is likely to do mischief, to do harm. A great many people suffer from appendicitis nowaddys.

I notice in studying the reports of the United States Census Bureau,--the mortality statistics, to which I am giving a great deal of attention,--I observe that in spite of all that has been done in the way of cure of appendicitis by means of the surgical operations, the number of deaths from appendicitis is increasing every year. The number of deaths has increased very considerably within the last ten years, from appendicitis, notwithstanding the great number of lives which have been saved by the operation for appendicitis. Why, if it had not been for the operation for appendicitis that has been developed within the last twenty years, if it were not for that operation, the mortality from appendicitis would probably be more than double what it is was fifteen or twenty years ago. The number of cases has increased so greatly that in spite of all the good care and the treatment that is given now, when we understand the disease, and the successful operations that are performed in such a great number of cases, the number of deaths from appendicitis--not the number of cases which occur, but the actual number of deaths from appendicitis is greater today than it was ten years ago; greater today than it was five years ago; so we see the malady is increasing, and it must keep on increasing. Why? Why because it

we are so careless in our habits of eating. Appendicitis is, in my opinion, due almost entirely to three things. Meat eating is one thing, because flesh food introduces into the alimentary canal the very germs which cause appendicitis. Appendicitis is a germ disease just as much as small-pox is, just as much as diphtheria is a germ disease. It is not produced by cherry pits and apple seeds, and peach stones and things of that kind; that is not the cause of appendicitis. The cause of appendicitis is germs, and the germs that cause appendicitis are found in beefsteak; that is where they grow. It is a beefsteak disease. There isn't any doubt about that. It is found in all kinds of meat--oysters, clams, lobsters, crabs, shrimps, frogs, spiders--anything in that line you know, that people may eat,--all dead things contain germs, unless you swallow them alive. Now, over in China they swallow them alive. I am told that over in China at a feast they sometimes have a great delicacy consisting of nice, little white mice just born, that haven't got their eyes opened yet. The little white mouce is lifted up gently by its tail, dipped into a little dish of honey, then is swallowed intact. Now, I should think that was a nice way to do it, if you are going to do it at all, and why not? I saw a man step into a restaurant some time ago, and there were some live oysters lying there alive and kicking, just as they were right down at the bottom of the sea, and he took those live oysters actually,--the man stood behind the counter and hit themwith a hammer, or something, and smashed the shell, broke them open, and this other man seized those oysters one by one and swallowed them alive and kicking, stomachs, livers, intestines, lungs,--the whole oyster is alive with germs in its mouth and the slime about it.

Now, you just examine some oyster juice, put it under a microscope and examine it, and it is just swarming with wriggling millions of microbes. I don't know of anything that furnishes such a live spectacle as a drop of juice from an oyster. Dr. Wiley,--I met him down at Chautauqua a few weeks ago,--told

me he had been having a very interesting ~~xit~~time with the oyster men. He had discovered the oyster men are in the habit of taking the oysters from the sea and carrying them up into the river and leaving them in the river a long time to get them soaked up with fresh water. They live in the salt water, and when they put them into fresh water, they ~~swxkkxw~~ swell up and are twice as large as they were originally, and it does not take so many to make a quart, you see. By taking the oysters from the sea and letting them swell in fresh water, they can double the output, and a thousand oysters will make just twice as many quarts as when they came out of the sea. That was adulteration, Dr. Wiley said, and they were adulterating these oysters with water, and the man who bought the oysters paid for water instead of oysters. I said, "That is all the better, Doctor,--the more water, the less oysters, the better it would be for the people who eat them." But he said there was something else to it. When those oysters swell, absorb the river water, they absorb the sewage right along with it, you see. The sewage that comes down through the sewers, the river water is full of it, and it is full of typhoid fever germs, and all kinds of colon germs, and germs that grow in the colon ad produce autointoxication and all kinds of miserable things--these germs are swallowed by the oysters, so the oysters stomachs and intestines are just full of these typhoid fever germs and colon germs; so when they get to the consumer, and the consumer swallows these, swallows these swelled oysters,--the oyster men call it giving the oyster a drink, you know--soaking them up in this way. These oysters that have had a drink of river water, and typhoid fever germs have come along with the water, and they often communicate this disease. Any number of people die because they swallow the oyster in this condition, in a live state, swallow the intestinal contents right along with it, and they get the germs the oyster ate as well.

Now, as I was saying a little while ago, thiscondition of the alimentary

canal is produced by the eating of oysters and all this sort of thing--Mr. Fletcher as well as other people, has been addicted to it, was for a great many years,--it has resulted in chronic autointoxication, and he was bloated, over weight, and he was in such a state that he could not get life insurance; but when he began to chew, to take pains to masticate his food thoroughly, then his digestive juice had a chance to disinfect the food, to get into all parts of it, and destroy the germs, and then it had an chance to ~~dext~~ digest it quickly, and he began to improve very greatly, so that he developed in a little while such a remarkable state of health that he hadn't any difficulty whatever in getting life insurance, just as much as he wanted to; and he found himself year by year becoming more and more rejuvenated. When he was here last summer, he went out to the outdoor gymnasium and did these stunts you saw here displayed upon the screen, and he certainly was one of the livliest athletes in the outdoor gymnasium.

The man you saw standing on his hands and springing into the water without turning a summersault was Prof. Stapleton, from Yale. He is a very interesting character. He was the teacher of wrestling at Yale University. He taught the young men there how to wrestle with one another, rather than how to wrestle with their mathematics, and their old classics, and he was a remarkably strong man; I think he is the finest physical speciman, has the finest physique I ever saw. He has the most beautifully developed body, a most beautiful physique I think I ever looked upon; and Mr. Fletcher says the same. He never saw a man with such a beautiful body as this man has,--strong and vigorous, wonderfully enduring. Now, Prof. Stapleton was one of the men upon whom Prof. Chittenden made his remarkable experiments eight years ago when he had sixteen soldiers, and six athletes, and four college professors, and put them all on a low protein diet, and he kept making the diet less protein, less protein, les s protein for a long time, until they took only one third as much as people were accustomed

to take; and he practically gave them no meat at all--just a little piece of fat bacon, perhaps, just about so big, so they could not say they had had no meat; so they could not be classified as vegetarians, you know. I am not saying that is the reason Prof. Chittenden did it; but they did eat a little fat bacon--no lean meat or protein in it at all,--and this small amount of protein was found to be amply sufficient. They all improved in vigor; the athletes doubled in strength, the professors that had dyspepsia, and rheumatic gout, and other things got well, and the soldiers also doubled in strength and endurance and courage; they increased their courage so that they were able to undertake feats that they did not dare try before. Their strength was tested on the same machine on which your strength is tested. We furnished one of our machines for their use, and in testing their students there they use this machine; and we have also furnished the United States government with a number of these machines, made in our machine shop, for the testing of the cadets and the young soldiers in both the military school and the naval school; we have also sent one out to the Philippines for the military school there. The cadets are all tested on the same strength test machine you are tested on. It is the only machine in the world which will test a man thoroughly throughout his whole body. Now, he had these tests made at the beginning of the experiment, and had the tests made again after the close of the experiments, at the end of nine months which the experiment lasted on the low protein diet, and he found their strength had doubled. Now, that was a matter of some significance. Prof. Stapleton was among them. He became so much interested in this low protein idea that he cut out meat entirely. He was considered a very strong man at that time. He was able to take hold of a horizontal bar with his hands and raise himself up seventeen times, up above the bar,--seventeen times without stopping, and he was a man of considerable size; but there was one other young man who ould do it twenty-three times. He could

do it twenty-three times, and Prof. Stapleton could do it only seventeem times, but the other man was very much thinner, and considerably lighter. Now, Prof. Stapleton left Yale and took a position elsewhere, and he gave no attention to this matter of lifting, did not practice on it at all, but at the end of two or three years, he thought he would try it after three years on the low protein diet, he thought he would try to see how many times he could lift himself up, and to his surprise, he was able to lift himself up 45 times right off. He found his muscles had gone on growing, and his strength had increased so that he was able to lift himself nearly three times as many times as he could before, and without any special practice. You see, it is not a question of strength; a man can lift his weight; but it is a question of endurance, and he found his endurance had increased so wonderfully that it was nearly three times what it wa was at the beginning. So at the present time, and for the last eight years, Prof. Stapletonis a strict abstainer from flesh foods; does not eat meat at all.

Now, that is a matter of importance, because the thing that will make the body strong, that will give the body more endurance, that will give it greater resistance against fatigue, that same thing will give it resistance against disease. We are sick because we invite disease. We open the door for disease. We open the front door and the front gate, and sayx to disease, "Walk in and take possession of us." We open the front door and say, "Come right in and take possession of this house; take possession of everybody here"; and we hire a cook to work for us in the kitchen to manufacture disease for us, to be served up to us on the table, and we sit down at the table, and we swallow disease.

I remember a man who was very much surprised one day. He had a headache and complained about rheumatism. He said, "Doctor, I have rheumatism." I said, "It is very evident, from the way your fingers are swollen up that you have

have got rheumatism." He said, "The mystery is how did I ever get it?, I never drank, whiskey; I smoke some, but not so much as other people do. Why should I have rheumatism when other people do not?" I said, "You swallowed it." He said, "What do you mean? How could I swallow rheumatism?" I said, "You have been swallowing it day after day, when you sat down at the table and ate beefsteak." He said, "Why, yes, that is my chief reliance. I live mostly on beefsteak. A man that is going to do a great deal of hard work must eat meat to be strong mustn't he?" That man was laboring under the same impression, I suppose, that the majority of pepple are that a man must eat meat to be strong. The instinct is strong that is I want to be strong I must eat an ox. Why not eat an elephant or a whale? I think it would be just about as reasonable. You remember somebody wrote to Artemus Ward some years ago,--a fellow out west, that he had heard that fish were good brain food; and he wrote to Artemus Ward and asked him to tell him how much fish a man of his age ought to eat. Artemus Ward wrote back to him that he thought a small whale would be about adapted to his necessities." Now, there is just as much sense in the idea that one must eat fish in order to get a strong mind as that one should eat an ox or an elee phant in order to have strong muscles. The ox got his strong muscles from what? How does the ox get his strong muscles? What is the ox made from? The ox eats corn and grass. His muscles are made of corn. How can we expect that corn is going to be improved by going through an ox? We only have what the ox has left, but we take the most of our corn in the shape of pig. We let that pig swallow the ear of corn and roll it around in the mud for six months, then we eat it second hand in the shape of ham, sausage, or something, and we do not appreciate the fact that that corn after the pig has abused it, is not worth one quarter as much as it was before he touched it. It takes ten or fifteen pounds of corn to make one pound of pig, and when it is made it is not worth half as much as is the

the corn before he touched it. Why, an ounce of corn has over 100 calories of food in it. An ounce of corn has over 100 calories of food in it, and an ounce of pork has less than 50. If it is particularly fat pork, it may have as much as 52 perhaps; but the ordinary pork, take the whole hog as he comes right straight through, has less than 50 calories to the ounce. So you see what an enormous amount of corn is thrown away. The fact is this great corn crop--I was figuring it out a little while ago,--if it was all fed to the people there would be enough to supply all the peop e of the country twice over; the corn that is thrown away in this country by being fed to pigs, would support all the people of the United States, and a population three times as great. But we feed it to the pigs, and we waste so much that we have hardly enough to feed the people. Why, we could have enough and to spare for everybody. There is enough corn raised in this country, almost, to feed the whole world, if we did not waste it in feeding it to pigs. The notion that we should eat something strong in order to be strong seems to have originated from savagery.

I think this notion is one of the relics of cannibalism, away back in the dark ages, somewhere, about three or four thousand years ago, when our forefathers were cannibals; at least some of mine were, and I suppose some of your forefathers were cannibals too, and were savages, roaming the British Isles. Some of you may be so fortunate to be descended from more respectable ancestors than mine, but that is where mine were. Now, the cannibal does not eat human flesh simply because it is good. He likes it, though; I have understood it has very much the flavor of pork. At least, a New Zealander, a Maori told me some years ago that he had talked with his grandfather who had eaten missionaries, and his grandfather told him they tasted just like pork; so those islanders used to call human flesh "long pig" and that was the name that was given to human flesh--"long pig." Now, the Sandwich Islander was once called

called to a court; I think this was in Honolulu, a man was brought in there, in the Hawaiian Islands,--was brought in for a decision as to whom a piece of property belonged to. A man claimed it to be his property, and there were others who claimed it to be theirs. This man brought in positive proof that it was his, and he got the property. The proof was this: The judge said, "Why do you insist this is your property? What proof have you?" He said, "I ate the owner." Now, the eating of the owner of the property gave him possession of the property, and te property belonged to him. I asked Mr. Pomare, who was a young man who came over here from New Zealand, to be educated, a native New Zealander, a Maori--I asked him what his grandfather told him with referece to the eating of human flesh. He said, "I once said to him, 'How could you do it, Grandfather? How could you eat human flesh?' 'Why,' he said, 'We didn't eat it because we liked it, but when I killed a chief'"--his grandfather had been one of the great chiefs, --"'When I killed a chief I ate him so that I would have his valor, so that I would have his courage, and so that I would get possession of his strength and his vigor. That is why I ate him', I think it was for that purpose." And I have learned from other sources with reference to cannibalism, in other countries, things which lead me to believe that that is the prevailing idea. A missionary in central Africa said that he one time said to a cannibal chief there, "How can you eat human beings when man is such a noble creature,--how can you think of such a thing as to kill him and eat him?" "Why, don't you eat an elephant, of something of that kind", he said, "why do you kill the man and eat him?" What do you think the chief said? He said, "The more xkx noble the animal, the more noble the diet." That was just his idea of it. Why not? A native of India said, "I can understand how a man could eat another man. I can understand that, because sometimes I am so angry at mys enemy I feel as though I could eat him. But how one could ever eat a cow,- such a gentle creature as a cow, I can not understand." Now, that is what the Hindu thinks about it,--the people

who have not tasted flesh for many centures. That is the idea they have.

Now, this idea that we must have flesh in order to live and to be strong is getting pretty well exploded. I am very proud to say that I have not eaten a pound of flesh in 45 years, and I don't feel the need of it at all. I was able yesterday morning to eat a breakfast consisting of two ears of raw corn. If you have never eaten uncooked green corn, I wish you would try it. I xxxxxx do not mean the dryed, raw corn, but corn in the milk state, the green corn, as it is called. -t is a great deal better without cooking; it is more palatable if you get just the right variety. It was really very inviting, and is very good when one gets accustomed to it and you have gotten a little acquainted with it. At first you would say, "Oh, this is raw; I must not eat it; I can not eat that", and you think of the raw potato; but unripe corn is a very different thing from a raw potato. In the raw potato the starch is all there in the form of hard starch, while in the corn the carbohydrates are there in the form of dextrin and sugar. That is the reason why it is sweet. You let the sweet corn get ripe, and it is nothing like so palatable as it is in the green or unripe state, when it is in the form of milk, and the carbohydrates are in soluble form, and the proteins are in soluble form too; so when you eat it you have a creamy mass in the mouth which is at once digestible, whereas if you cook it it becomes hard, and it hasn't anything like the pleasant flavor it has raw; and its best properties are destroyed. Try the experiment; ask the waiter to bring you some raw corn tomorrow, if you have corn for dinner,--to bring you an ear that has not been cooked, and you try it. I will be surprised if you do not think it is very nice indeed. I am sure you don't object to eating lettuce because it is raw. Why should you object to eating corn when it is not cooked? You do not have to bake lettuce or celery, to cook it before you eat it. The celery is a stem, and the lettuce is a leaf. The corn is almost ripe, it is the

almost ripe fruit of the plant; so you see if you can eat lettuce and celery without cooking them, there is certainly no reason why corn in the milk state should not be eaten without being cooked. It is really more digestible than many other things. I had for my breakfast yesterday, two ears of corn, rather small ears; two pears, and a dish of lettuce. I always take lettuce for breakfast. And three small tomatoes from my garden. And I had a very delightful breakfast. I came down to the Sanitarium then and wkxx went to wokk. At two o'clock I was at the operating table, and stayed there until after nine o'clock last night. I had a lot of very hard, difficult cases, one right after the other, and then I xxxxxkx did what I do not usually do--I ate an orange, and a pear, and ate a little more lettuce, and I think there was a little cup of broth; and that was my rations for yesterday.

I got up this morning and I did not feel tired; or weak; I did not feel the need of food. I ate my usual breakfast. I ate a couple of tomatoes, and a pear, and some more lettuce, and that was my breakfast. And that is breakfast enough for me. And I have worked hard all day until half past three o'clodk thisafternoon, when I had a little more bountiful dinner. I had some rice biscuit in addition to the other things, and the same bill of fare you had for dinner, and I ate a reasonably good dinner, and I think I ate perhaps 900 calories for my dinner. And that is my two days' rations. Now, the idea that we must eat large quantities in order to be strong is the very greatest mistake in the world, xvxxxxxxxxxxxxxx if one wants to keep his head clear and have his muscles active, and feel himself like a steel spring always ready for action, if one wants to feel that way, he must not be loaded down with unusable foodstuffs. The senator in Chicago that said he had eaten 86 wagon loads of food more than he ever ought to have eaten, after he had learned to fletcherize, he found that out. He had been working under a terrible handicap; he had been all

his life time under that awful handicap. He had that great load of unnecessary food resting on his brain and his stomach. He had some things on his pocket book too. Just think of the enormous quantities of money that are thrown a ay for useless material. I sat down at a hotel at the Hotel Belmont and got a very nice dinner one day for fifty cents. The man opposite me paid two dollars and a half for his dinner, and didn't have half as good a dinner as I did. Mr. Fletcher tells me he can live at the Waldorf-Astoria for fifty cents a day. He says he has done it, and he gets all he wants to eat, and all that he needs for his body for fifty cents a day, at the Waldorf-Astoria hotel, and a good many people spend five or six or seven dollars on their meals, and they are not nearly as well nourished as Mr. Fletcher. So it is a thing worth thinking about--the enormous waste, the enormous economical waste as a result of wrong eating; it is worth while to learn how to eat. In a recent number of the Popular Science Monthly a Colorado professor has an interesting article on the future of the human race, and he figures it out that the human race has only got 100 thousand years to live, and that within 100,000 years we will go to the wall in spite of our efforts to the contrary. He points out the fact that all mammals of the higher classes of animals have run out sooner or later; that they either become extinct, or else they are changed to some other form entirely unlike what they formerly were; and the reason of this is because of the changing seasons of the earth, the changed environment to which they are subjected. Man, he says, has escaped the destruction that other animals have undergone, and he has escaped it by his ability to adapt himself to changes in climate by the invention of clothes and houses, and his ability to prepare food through cookery, and in other ways to adapt himself to emergencies, to overcome difficulties. But he says inspite of all this, man's conditions have so changed that he is running out, and in 100,000 years he will be gone. He suggests that we better return to our natural simplicity in diet as the most effective means of averting such a

calamity.

Now, the original simplicity of diet is what the monkey eats. Prof. Lull, of Yale University, the other day visited the zoological garden in London, and he made a record of what he saw the monkeys eat there. He looked through the bars and saw the orangs and the chimpanzies eating their dinner, and saw the keeper feed them, and the first course was lettuce. That is my first course. I emulate the monkey. And the next course was oranges. And there is nothing better than oranges. The juice of the orange contains sugar already digested and ready to be immediately assimilated and made into good blood and brain and nerves. And a third thing was bananas, and the last thing was bread. The monkey does not know how to make bread, and he could not in his native forest, but he got his bread already prepared for him, hanging on the breadfruit tree, so that really is about the best thing he could find in a country like England.

Now, if we would adopt this same simple mode of diet, the simple mode of life, if we would only adopt it, we would be delivered at once from a large share of the ills we suffer from. We were talking a little while ago about the pig, when we would let the pig swallow the corn, and we eat it secondhand. I remember an experience I had going along the stree in London. I saw a sign out over a pawnshop, "Secondhand teeth." Now, I had seen all kinds of second hand things offered for sale, but that was the first time I had ever seen a sign of secondhand teeth announced, and I passed it by and went back and took a second look at it to make sure my eyes gave me correct information. There it was, sure enough, "Secondhand teeth." I regretted very much afterwards that I did not stop in and buy a set so that I might have them here to exhibit to you, as proof of this thing; but it is a fact; there is a trade in second hand teeth in England. I soliloquized as I went along,--"Suppose I should get a pair of second-hand teeth in England, and undertook to use them. I would be thinking melancholy things, you know. I would be saying to myself, What were these teeth eating

the last time before: Did these teeth chew tobacco; did they smoke? What were they associated with before? Were they taken good care of? What kind of mouth was it that they were connected with, and all those things would be rather unpleasant and rather discouraging to one's appetite." I sat down at a hotel table to dinner soon afterward, and as I sat down and picked up a bill of fare, the man who sat next to me was giving his order, and the first thing I heard him say to the waiter was"calves' brains, if you please." I took a good, sharp look at him, and I said to myself, "I believe he needs some", but I went on down that bill of fare, and there were brains, stomachs, muscles, kidneys, livers, and therewas almost everything an animal has except his hoofs, hair, and horns, there upon that bill of fare. And I was reading not very long ago in a work on travel in which the traveller said the first thing on the bill of fare offered him in a certain part of Russia where he was, in the interior of Siberia, was fishes' eyes; so it seems eyes are sometimes served on the bill of fare, and considered a special delicacy. Now, I said to myself, as the people at the table were eating those secondhand things, "How much better is it to undertake to think with calves' brains, than it is to eat with secondhand teeth? And how much better could one expect to be able to digest his dinner with the aid of a secondhand stomach, a pig's stomach, or to do his liver work by the aid of calves' liver, or sheep's liver, than he could do with a good healthy, normal liver made out of the original materials?" You see, my friends, if we are going to build a house, we want to get the original things, we don't want to get old materials that we can pick up on the junk heap somewhere, --some old lumber that has been in a house before, or old bricks and iron girders, and things that have been once used before; we do not want that sort of material to build a house with, but we want the new, original material, right straight from the mill, or from the quarry, or from the brick kiln.

If you are going to get a coat you do not go to a secondhand store and g

and get a secondhand garment. If you are going to do that, you would make a very sharp inspection of it. If you were going to get a secondhand coat, for example, you would want to know it had been well disinfected, you would want to boil it well, you wantto shake it to fumigate it, to know that it had been thoroughly disinfected. You would want to be sure there was not a whole menagerie there coming along with it.

When you undertake to eat secondhand muscles you do not think about that. Here is beefsteak on your plate, and that is secondhand but you don't think of it. That ox was using that muscle. The muscle was working back and forth in the hind leg or the foreleg, some months ago, of an ox. It has been lying in a cold storage place since, and has been undergoing decomposition, and the germs have been multiplying and growing, and there may be tapeworms and various oter thingsthere, and you do not know how many different species, because they have been there and they have been growing and multiplying while it has been lying idle. You don't say to yourself, "I must know what is in this beefsteak before I eat it." You just swallow it without stopping to think anything about it; and those germs keep right on growing after they are swallowed.

A man came here a few days ago who had been living on beefsteak very largely, and we examined his intestines and found 900 trillions of bacteria--the product of one day, of just one day. They were all born and developed in that man's alimentary canal in one day--900 trillions. Now, a thousand million is a lot; 900 million would be a good many, that would be a tremendous lot, and 900,000 would be a lot; and 900 billion would be unthinkable, but think of 900 trillions! That is the accurate count that was made by very accurate methods,--of course, we do not count them all; but a small quantity was measured and by a very carefuleestimate of that quantity a determination was made. So when we eat meat we eat a lot of other things besides, and this old idea that vegetable products are refined by being taken into the animal kingdom, by being

organized into the animal, so the stomach and liver is saved, and we do not have to go to the trouble of making flesh, but can appropriate that flesh already made. That is the greatest mistake in the world. That flesh has to be torn down to all the original elements, to what are called the amines, the acid amines which are the crystalline bodies which are the very same thing as is done with the vegetable. If we eat vegetable proteins, these vegetable proteins have to be reduced to crystalline elements before they are appropriated, and the animal flesh has to be reduced to the very same forms. So we do not get the advantage, but we do get the disadvantage because we get the waste matters of the animal's body along with the flesh of the animal.

I don't want to overload you with these ideas, but I know when you go home you are going to be exposed to great temptation. You will be sitting down at the table, and there will be a fine roast turkey perhaps. Thanksgiving is coming on after while, and those roast turkeys will be very much in evidence, and you won't be thinking about what old Pythagoras said away back three or four thousand years ago,--

"First feed with household bread,
Then eat the turkeys that before we fed."

Now, just think of it,--

"If men with fleshy morsels must be fed,
And chaw with bloody teeth the breathing bredd,
What else is this but to devour our guests
And barb'rously renew Cyclopean feasts?"

Now, that is what an old heathen thought about it; so you see this idea that flesh eating is not the nicest thing in the world is not a modern notion at all; it is a very old idea; it goes away back at least to old Prof. Pythagoras who was one of the greatest philosophers of the ancient times. He was the teacher of Socrates, and Socrates taught Plato, and Plato taught Aristotle; so the philosophy of Pythagoras was passed down, and the real foundation of the wonderful phylosophy which was organized into a science.

So we must get rid of these old notionsx that we must have meat, that we must have flesh. Lord Byron said "Man is a carnivorous product; he must have prey." That is all nonsense, my friends; it is not true; we don't have to prey upon things, to seize something and kill it. Just think what the situation would be, how you would enjoy eating meat if when you wanted a little piece of mutton you had to go out into the back yard and catch a lamb or a sheep and cut its throat, then call the children to help you tear the skin off, then cut it up, take it into the kitchen and serve it up on the table,--how many of you would want meat? You would not eat meat under those circumstances. Suppose you had to kill your own chickens even. I don't think many of you would care to do that. When the thing is repulsive, the whole business connected with flesh eating is a repulsive thing to the human mind, a repugnant thing to the human instincts. If we are going to have a slaughter shop we don't want it where the children can see it; we don't it near by so we can hear the bellowing of the poor creatures, and the squealing of the pigs; we don't want to hear the bleating of the lambs; we want them to be so far away that we can not hear it. You know the little boy at the table said he would not like to have the little chickens see him if he was eating the mother hen up there. Suppose the little fellows were picking up some of the crumbs under the table, when he was eating the mother hen on the table. He said, ", would not like to have them see me." He felt really guiltyabout that. His remark reminded me of the story that Sunshine Hawks tells. When he was going down the hall with me, he said, "Doctor, I have got a good story and I want to tell it to you" He said, "You know, once there was a mother hen, and she had a number of children, and one of them was a very fine little fellow, and his name was Willie. And she went out on a visit one afternoon, and when she got back she found Willie had disappeared, and on inquiry she found he had been taken up to the great house, and there had been a lot of ministers there that afternoon, and he had gone up to the big house and he did not come back, and she hung her head in sadness because she saw very plainly what had become of Willie. By and by she assumed a more cheery aspect and she said, 'Well, it may be as well; that Willie should have entered the ministry, for he never would have amounted to anything as a lay member any way.'"

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HEALTH HINTS FROM EUROPE

by

Mr. S. S. McClure.

and

BATTLE CREEK SANITARIUM PRINCIPLES

by

J. H. Kellogg, M. D.,

Lecture at the Sanitarium Parlor, Battle Creek, Mich., Monday, August 29, 1910,

at 8 P.M.

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Dr. Kellogg: I suppose there isn't anybody here that has not read McClure's magazine, and I am sure if you have read McClure's magazine once, you read it all the time. At our house we alwayslook very anxiously for and with a great deal of interest for the next number of McClure's. We want to know what is going on in the world. And anybody that has read McClure's magazine has seen the name, S. S. McClure, but I presume you do not know what S. S. stands for. S. S. means secret service, or specious spy, or something of that sort; for the proprietor of McClure's magazine goes up and down the land all over the world, seeking out the things that are of special interest, that belong people ought to know, and are going to find out if he can discover them for them.

About a year ago or a year and a half ago when Mr. McClure, this universal spy, was going up and down the United States seeking for new things, for McClure's magazine, he dropped in here one day and spied out a few things here, and came again, and has been coming occasionally, and has since that time been over to Europe looking around. Mr. McClure is a man that does things. When the experts of the United States navy discovered that their old boats were all out of date, and they wanted to get a reformation, they called upon Mr. McClure

to investigate the mattwr and tell the whole country about it, and the country got so excited the government had to do something, and it has resulted in a complete revolution of the management of the United States navy. Instead of having men to manage the navy that never sailed on salt water, they now have web-footed men who have something to say about it, as the admirals call themselves. But I must not say anything more. You want to hear from Mr. McClure. And he has just got back from Europe and has been observing things over there, taking notes, and he is going to tell us something of his observations. Mr. McClure. (Applause).

Mr. S. S. McClure: I have no doubt that you are all laboring under a misapprehension. I am only going to talk about five minutes, and not about things in general. I think I am too experienced a journalist in knowing what the public wants, to take any of Dr. Kellogg's hour this evening. I think a man would be both bold and ignorant to endeavor to talk to you when you have been expecting to hear from Dr. Kellogg. And what I shall say will probably make him blush. I have got him where he can't reply to me, and I will deal solely and only with a comparison between Battle Creek and the leading cures of Europe. You know that almost all the cures in Europe are based upon the use of water, as Battle Creek is to a certain extent. And for this purpose they have devised many apparatus and many methods of using water. Now, the first point I make is that at no one place in Europe whether at Carlsbad, or Kissingen, or Homburg, or Weissbaden,--at none of these places will you find as complete and perfect a series of apparatus for the use of water as you find here in Battle Creek. Another modern idea in Europe and a very good one, is establishing places where people live outdoors naked, and where that is the entire cure. Now, this is one of the few places, almost the only place, in America where one can have that cure. That is arranged here. Within the last few

years in Europe the idea of curing diseases by the proper selection of diet has been developed, but that method of curing was developed in Battle Creek long before it was developed in Europe.

Now, I am going to speak to some of the newer people here who have not been here long enough to have confidence, and who have not a method of comparing Battle Creek with other places. For ten or fifteen years a very distinguished European doctor, Dr. Comb, at Lausanne,, has been curing people largely by diet, and people come to Lausanne from all over the world. There they have many large hotels, and these hotels are generally half filled--that is, half the residents are people who are there for the purpose of being treated by Dr. Combe, and the dietary of all these various guests of the hotels, ~~xx~~ and there are six or eight of these huge hotels, and all their bills of fare made out for them and served by the hotel people, just as you have your bill of fare made out here, but you would find it very difficult in any of these hotels to be able to get just such a curing diet as you can get here. You would find that Battle Creek under Dr. Kellogg far surpasses Lausanne under Dr. Combe. Dr. Combe is a very great and distinguished doctor, known all the world over. He is the author of probably the most readable book on autointoxication which you will hear about tonight, no doubt, and to avoid which these new dietaries have been devised.

Now, I eas telling Dr. Kellogg this afternoon about my observations in Europe. As a universal spy I have spent perhaps half of the last twelve years in Europe, and have had occasion to spend weeks and months at different places for my health, ~~xx~~ and my wife's health, and I have noticed in Europe the kast two or three years an extraordinary development of Battle Creek ideas. Not that they know it over there; they imagine they have invented these ideas themselves, but the frequent and continual prescriptions of doctors to avoid the use of meat. My wife after trying Carlsbad and other places, went down to Algeria for rheumatism, and the doctor there helped her extraordinarily by

cutting off meat. And this idea that when I first came to Battle Creek seemed to be the notion of a crank--not to eat meat,--I find is accepted and used and being developed by the foremost doctors of Europe, and in the foremost places where they heal people. Now, I could just as well spend my time at any one of these places in Europe as to spend my time here, but I find it more profitable to spend my time here because I find more things at Battle Creek, better things at Battle Creek than I can find at any one place of the great health resorts in Europe, ad for a great deal less money. Now, here is where Dr. Kellogg's blushes come in.

You know that a very few of the guests of this establishment, which is about as well, as comfortable as you can make it, pay the actual cost of that guest's entertainment and treatment here. Very few of the guests here pay what it costs. It costs I think something like twenty-four dollars apiece, the actual cost to this establishment, for the care of each person here on the average. Now, lots of you are living here for less than $24 a week, because they have cheaper rates than that. Now the reason that you can live here below the cost of living here, and have all these things arises first from the fact that Dr. Kellogg maintains here a great training-school, and he has a body of men around him, like minded men, who give their services for a very small part of what their services are worth, and further because whatever fees are earned by Dr. Kellogg as a surgeon--and he is one of the foremost surgeons of the world--all goes towards the upkeep of this building and this place. No man makes any money out of Battle Creek. No man makes any money out of this esthblishment. All the men that do the work here, and all the women, ad all the boys and girls give a part of what they get; a part of what they get is the honor and pleasure of doing the work, and what they learn. And Dr. Kellogg himsels has never had a dollar of profit from this business. Now, then, the

same kind of xxxxxxxxx spirit that makes a business in this fashion, that really makes it the achievement of a man's heart and soul, is one cause why this placex surpasses, I believe, any other place in the world, and I have been around among them for eight or ten years, and I have been here half a dozen times, and I believe that a man can get more out of this place that will be of firmer value to him in building up his health and his strength and his energy and in giving him hope than in any other place in the world. (Applause). xx

No man who had any idea of making money would ever make a place like this. It is not based upon that conception. It is based upon the conception of having the most perfect assemblage of all the best methods and all the best ap aratus for making people better in health and better in sul, to make them better men and women, and to show them how to live, not simply during the few days or weeks they are here, but to help them to be stronger and healthier, xxx all the rest of their lives; and everything depends on health. A man can not by any possibility take unto himself any other gifts or endowments than God given in the first place; he can not add a single thing to that. The only way a man can help his mental activities is by the improvement of his health. That is the only xixx way that we can help our brains. And I think a man can learn more here hos to improve his health than anywhere else.

You know among the fundamental ideas of this place, in the way of curing the people by the proper use of food, making people stronger by the proper use of food, keeping people in health by the proper use of food. Now, Dr. Kellogg has simply been in advance of the others in Europe and elsewhere; but although Dr. Kellogg hasx been in advance of them, I can safely say tonight that the great investigators in Europe in their laboratories, in their practice, have developed and brought into common knowledge and the common acceptance of people in general almost every single principle that Dr. Kellogg has put into operation. (Loud applause).

Dr. Kellogg: I feel very much abashed to appear here after these remarks by Mr. McClure. I never find myself set forth as being a man of any consequence without recalling a little scene in my office some time ago. A man came into my office,--well, one of the doctors knocked at the door of my office and said, "Doctor, there is a man in the office who wants to see you." So I stepped into the next room; I came in rather quickly, and I saw a gigantic man standing up here, and it seems he was inquiring for Dr. Kellogg. His lungs were the question under examination, and so I stepped up and began to percuss his lungs, and I had to reach up here somewhere, to reach his chest, and he began looking down at me,--"Are you Dr. Kellogg?" I said, "Yes, that is my name." You know, he just left me, and went to looking out the window and looking back at me over his shoulder. And finally he said, "Are you Dr. Kellogg?" "Yes, that is my name." "I thought you were a larger man." "No," I said, "I am very small potatoes", and what do you think he said to comfort me? He said, "That's a fact." Well, now, inspite of all that Mr. McClure has been saying here, I recognice the fact that I am a very small specimen, a small potato, as I was saying. I have not done a thing with this institution that I wanted to do. The thing that is great in this institution is not a great man; or a great body of men, or anything wonderful about the people here; but, my friends, it is the wonderful principles we have. Now, I am perfectly willing that these principles should be held up and magnified as great and good. I did not create them; I am in no way responsible for them; they are just as old as the world, and I consider myself very fortunate that forty years ago, while I was still a boy--45 years ago now, in fact, I got hold of some of these principles. And my mother was as much responsible for my getting hold of these principles as anybody, for when I was a boy and sick, my mother always treated me with water, gave me a wet sheet pack, or something of that sort. She got hold of the idea of

water treatment away back sixty years ago, before I was born, and she applied it to all her children, and it was a great, great, great blessing. I remember my first experience with a cold shower bath.

In those days we did not have the conveniences we have nowadays, but we had in a part of our house a little room, a little closet set apart for cold shower baths, and it was the duty of every member of the family to patronize the cold shower bath at least once a day. This was a rude affair, with a wooden box up in a room above, and a bucket, and a tin pan punched full of holes. There was a plug in a hole in the pail, and we pulled the plug out and the water went through. I remember my first experience. I got into the shower bath room and closed the door. It was a little place about three feet square. Then I pulled the plug out of the box, after having laboriously filled the tank with one pailful after another by climbing up a ladder on the outside, with water from the bottom of the well. I pulled the plug, and I let the water dash down. The water continued to pour, and I said, "I think I have enough," and I sprang at the door, but the door stuck fast, and I was obliged to remain in the inside and take a whole tubful of ice-cold water. I had all I wanted for some time.

That was in the crude days, in the beginning of things. It was rather a discouraging experience for me, and I was somewhat prejudiced against cold water.

When I was about twelve years old, my mother saidx to me, "John, what are you going to be when you grow up?" I said, "Mother, I will be anything but a doctor." But circumstances placed me here. This institution started as a little water cure just forty-four years ago next month,--the fourth day of September, I think, of next month, 44 years ago this institution was opened, and I sat under on e of these trees out here. My father was one of the promotors of the enterprise, and the treasurer of the establishment, and I was his deputy. I was a boy of fourteen, and I sat under one of these trees on dedication day, and

about 100 people gathered here, and we thought it was a great occasion. 100 people--think of it,--that were interested in these principles; and it seemed like a wonderful occasion, you know, and there wasn't any room in the house big enough; there was nothing but a little two-story farmhouse on the premises, but the table was spread out under the trees, and after the meal was over, we had a very enthusiastic time, and there are still living in the city here some citizens who came in there to that dinner on that day, though I think I am the only person that was connected with the institution in any way at that time that has been connected with it during these years.

Now, some years after this, when I had graduated in medicine,--my father sent me off to medical college, and I went because he ordered me to go, and for no other reason. I intended to be a teacher; that is what I intended to do. I was down east and the xxxxxxxxo president of the board of trustees came down to see me, and told me that the board had voted to ask me to come here and take charge of the institution. xxxxxx That was just 34 years ago this present summer,--and they had decided that if I would not do it, they were going to shut it up. The institution had not prospered as a water cure. There were only twelve patients in the establishment; it had been running ten years xxxxxxxxxx and they had had more than that, but it was running down, and had run down until only twelve patients were left, and they thought they would close it. So, rather than see it closed, I thought I would come up and stop here a while, and I came into it with the agreement on the part of the board that the place should be turned over to me, and I should do anything I thought necessary to convert it into a scientific establishement; and I began to try to get it on a scientific basis, introducing electricity and other things, and putting things on a scientific foundation. It was purely empirical and had no really scientific medical direction at the time; so the work began to grow.

I was here a number of years, however, before I made up my mind to stay here. Within a year we had 100 people. The next spring, I took charge the first day of October; 34 years ago next spring we began putting up our first main building, and in 1878 we dedicated our first main building. It held about 130 people, and when it was dedicated it was full, every room was occupied. As fast as a room was finished, a patient was put in; so every single room was occupied when it was finally dedicated. It was finished from the bottom upward. From that time to this there has never been a day when the Sanitarium family could be housed in its main buildings, and there has never been a summer from that time until the present time when it was not necessary to rent every room that could be gotten hold of in the neighborhood to accommodate our guests; so our buildings have never been large enough to accommodate our family of patients to say nothing about the workers nearly all of whom live outside the institution, although we have some dormitories, but generally as soon as we get a dormitory erected, instead of using it for helpers, we had to use it for patients.

Now, this idea has been growing in the world, and it has not been growing from anything that I have done; but it has been growing because it was time for it to come; the world was going down hill so fast that we had to have something to keep us alive. Why, I don't know what would have happened to this world, I don't know where we would have been if it had not been for these reforms that were introduced beginning away back 100 years ago with Priessnitz, who had the first sanitarium,--a little water cure away up in the hills of Graefenburg in eAustrian Silesia,--if it had not been for his pioneer work in grouping together the methods which he found in use among the peasantry. The wet sheet pack was used among the peasants of Germany and Austria two hundred years ago, as well as various other means used at present,--shower baths, douches, etc.,--these were all in use among the peasants in the middle ages, among the peasantry

of Europe. The strange thing is that the medical profession, the sdientific men had been so slow to get hold of these important modes of natural cure, and to make a practical application of them. But the time has come when it is being done. Winternitz of Vienna, for forty years has been making a scientific study of water, and through his pioneer work these principles are spreading throughout Europe.I know Prof. Winternitz very well, and count him as one of my best friends, I visit him when I go abroad, and I hope sometime he may come to this country and visit us. And Brieger, at the present time a professor in the Imperial Medical School of Berlin--he is a student of Winternits, ans he has introduced water into the great Berlin university, and lectures upon hydrotherapy and light and electricity and exercise and massage, and all these various methods of treatment ~~inslud~~ ~~xanx~~ one by one as they have come forward and been dveloped. And through the work of Pawlow of St. Petersburg, and Cannon of Harvard, and Combe of Lausanne, and numerous other ~~works~~ the principles of dietetics have gradually been developed.

As I said before, I make no claims for myself at all here. Here at ~~Battle~~ Creek we have been using these low protein methods for many years, for forty years or more; and the reason why I was ~~a~~Oconvinced disciple of the idea of discarding meat was because it appealed to me as being good. Prof. Fisher asked me one day in my office, "Doctor, how did you get hold of these ideas so long ago, before scientific facts were sufficiently numerous to furnish a real foundation, scientific foundation for this low protein dietary?" "Well," I said, "Prof. Fisher, I adopted the non-meat diet because I liked the flavor of it. We didn't know the scientific argumente then that we know now." If you analyze your own state of mind and your own attitude toward new ideas that are presented to you, you will see that ~~this~~ it is not ~~an~~ argument that persuades you of the truth of a thing. We do not know truth by argument. It is conviction. It is

conviction. We know truth by the taste of it, so to speak--by the flavor of it, by the smell of it. We have an instinct which is neither taste nor smell; it is an instinct to tell us what is true, what is false as well. It is conviction. You may take a peasant who does not understand the principles of logic, and you may present to him a sophistical argument, and show the views he holds as being utterly absurd, perfectly ridiculous, but you wan't change his mind at all no matter what arguments you preset to him, because he is convicted that a certain thing is true, and he stands by it.

Well, now, I was convicted, if you please, by reading some works of Cuvier, the great French naturalist. He said that the natural diet of man is th the same as that of the monkey. Man has teeth like the monkey, he has muscles and bones like the monkey; his physical structure is so nearly like the monkey that it is practically impossible to tell a very young ape from a very young human being--almost impossible; requires an expert to distinguish the skull of a very young ape from the skull of a very young human being, the whole structure of their bodies is so wonderfully alike. So, he said, while the structure and the functions are so nearly alike, the diet is naturally the same--a diet of fruits, nuts, and soft grains. Now, I said, "I will try the experiment for myself. I am just one person, and it won't be a very serious matter; so I will try the experiment; it is just one life, and I will see how it works." And for twenty years I was looking all the time to see if I could find any flaw in Cuvier's proposition. I hunted hard for arguments against the idea, and sought for arguments on both sides, of course, but I did not know for sure whether it was right or not. The last twenty years I have not had a particle of doubt. It took me about twenty years to become absolutely and thoroughly convinced that that position was thoroughly right; but in the last twenty years, I have not had a particle of doubt, and it certainly has been a very great comfort, as I said before, to see the scientific world coming so rapidly to the low protein

idea, and especially the experiments of Prof. Chittenden. I think Prof. Chittenden's wonderful work at Yale, as I said, has had a great deal to do in convincing medical men of the importance of the low protein idea. One of Prof. Chittenden's students was saying to me the other day,-- a man who graduated from his scientific school there,--he said, "I don't see why Prof. Chittenden eats meat." I think he eats a little of it. I notice when he publishes a bill of fare he always has a little bit of fat bacon ~~kxxxxht~~ fried very hard in it--about so large, and that is always in his bill of fare. He said, "I don't see why he eats meat, because you positively have to leave it out if you are going to live on a low protein diet, on a standard so low as he puts it. There is no room for meat; we can not get it in." And that is the reason why he eats fat bacon, don't you see? I don't think Prof. Chittenden finds the use of meat at all necessary, but he takes a little perhaps, because he is fond of bacon, but he does not dare eat the lean bacon. He can not, because there is no room for it; he will take too much protein.

Now, my experience has been that people who adopt this low protein dietary and adhere to it are absolutely certain to be helped by it, other things being equal. And year by year they find themselves rising higher and higher and higher in endurance and efficiency, and general wellbeing. Some of you remember that about ~~xixtx~~ a years ago now, we had a visit from Mr. Goodwin Brown of New York. Mr. Goodwin Brown is a prominent lawyer in New York. I had a visit a short time ago from a prominent banker of New York, the manager of the Bankers' Trust of New York, which is perhaps one of the most remarkable banking institutions in the world; I think it has a deposit at the present time of 7,000 millions although the bank has only been in existence seven years. The manager of this bank, Mr. Thompson, is an old patron of ours, and was with us a little while ago. He knows Mr. Goodwin Brown very well, and remarked that he did a

great deal of business with his bank. Mr. Brown came here to inspect our work. He was a meat eater, but had learned to fletcherize his food, and was a very earnest disciple of Horace Fletcher, but he had never seen the necessity for dropping meat, and when he came, he came to be looked over and examined a little. He felt wonderfully improved as a result of fletcherizing, and didnot know but what he was perfectly well; and some of you will remember possibly that he stood here and gave an account of his experience, how nervous he used to be, how cross he used to be, how irritable he was, and how depressed, how he lacked efficiency, was tired all the time, did not sleep well, didn't have a good appetite, how miserable he was in general, and how he had been lifted out of that by fletcherising, and it helped him so much. A report of his remarks here was published in the Battle Creek Idea, and the other day he saw the publication and he wrote to me here and made a few corrections in it, or additions to it, and wanted to have several hundred reprints of these remarks of his, because he said, "Be sure to put the date on, because I have improved so much since that time, and since I came home and stopped the use of meat entirely, and stopped the use of coffee entirely, I have made such a wonderful improvement that I want the date put on"so we are having them printed for Mr. Brown so he said, "I am having them printed because so many people have noticed the great improvement in me, and want to know why, and I want these reprints to send to them so they will understand why, and it will save me writing so many letters."

Now, this is the common experience of men. A short time ago we had a visit here from a prominent business man of St. Louis, one of the best known business men in the whole United States. He would not object if I tell you his name. He is the manager of the Simmons Hardware Company,--Mr. W. D. Simmons. He came here a pretty well brokwn down man three years ago, but in four or five weeks he got accustomed to the meatless diet, and he sent for his wife to have

her come, and she brought the children along so they all could get initiated, and they went home and adopted the dietary of the Sanitarium; and when he dropped in here the other day, I reall did not know him; he looked so young, looked like a boy about 25 or 26 years old, and he is 43 years old. He said he could not make anybody believe he is past forty. He is just brimful of energy and vim as a steel spring that is all the time sticking right out. I asked him if he was adhering to the low protein diet and Sanitarium ideas of living, and he said, "Indeed I am; why, it has been a great business asset to me--getting hold of these principles." He sent up one of his leading managers here to get him converted. And I might mention a great number of similar instances.

An interesting case, Mr. Owen, a gentleman from Oklahoma was here last year and was brought here on a bed, looked as though he was absolutely dead. His eyes were without color, and he looked as though he was absolutely dead. His blood had gone down, down, down until it was only 16%,--his hemoglobin. You have all had your blood tested, and most of you were glad to find it was pretty nearly 100. The blood had gone down before he came here until it got down to 16. He could not raise his head without fainting away. It looked as though there was not much hope for him. We sent out and got some scraped beef for him, didn't we? and beefjuice, and beeftea, and all that sort of thing--didn't we? Not a particle of anything of that sort did he have; but he was brought up on this low protein dietary, and he came back to show us how well he was, and he is just the picture of health. His hemoglobin is 86, and he got it up a few points more and went home, feeling tiptop, and it certainly looked as though he was likely to attend a funeral pretty soon when he arrived here a year ago.

Now, such a case presented, I am sure, at the door of any hospital, almost any hospital, would have been pronounced incurable, an incurable case of

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nicious anemia of the very worst sort. And I am not taking any credit to myself for his getting well, for I didn't do anything to cure him. It was simply the diet that cured that man. It was simply the diet, because when he was being fed on a meat diet, he was continually eating the thing that made him sick. Prof. Welsh, of Johns Hopkins University, and Prof. Herter of New York, have shown that meab contains almost every specimen of meat you can get xk contains certain bacteria which when they grow produce a poison which when it is absorbed into the blood is capable of dissolving the blood and destroying the blood. Welsh's bacillus, it is called; and Prof. Herter experimented with this particular bacillus, and he found when he raised it, cultivated it in a testtube, and took that testtube culture with those germs in it and added it to the blood, that it dissolved the corpuscles and destroyed them.

Now, what the man who has anemia needs is not the making of more blood; that is not the thing he needs in general. He is making blood enough, but he can not keep it after it is made. What he wants is to stop the destruction of the blood; that is the thing that is necessary, and this is accomplished by clearing out the bacteria which are infesting the alimentary canal, which are destroying the vital fluid of our bodies. So that is the all important thing. The old idea that meat was necessary to make blood is thoroughly exploded. It is the very thing that destroys blood. I xxxxxx might mention this as an illustration of what Mr. McClure was saying a moment ago. Scientific men of Europe by their own laboratory researches and clinical experience, and not by reading any of my works or anything of that sort, have come to these same conclusions. They are coming to recognize it. One of my colleagues, Dr. Mortensen, was present at a lecture by Dr. Strauss, one of the most eminent physicians of Germany, physician to the Emperor, and a man was brought in who was suffering from pernicious anemia, and the doctor said, "Gentlemen, you see this patient

has pernicious anemia. Now, what shall we do for him? We will simply put him upon a vegetarian diet; we will feed him a vegetable diet, vegetable food, and he will get well. We will be careful to exclude all meats. Now, I don't know why; I can not tell you the reason why, but I know it is so that if we put him on a strict vegetarian diet, cut out all meats entirely, he will get well." Sure enough he did. Now, Prof. Herter, of New York, an eminent bacteriologist there, has shown the reason why. He cultivated the germs found in meat in a testtube, and found those cultures added to the blood destroy and dissolve the blood; and he found it was Welsh's bacillus that did it. That is one fact. There were others also that do the same thing. So you se here is wonderful confirmation of the practical results we have been getting here for the last thirty years.

I remember about 25 years ago I wrote to a professor of medicine in a college, I was well acquainted with,--I wrote to him that we had a case of pernicious anemia here and the man was almost well. His blood had been down to 20 and he was almost well, and he got well, and went home with his hemoglobin 100%. Well, the professor wrote back that he might be better for a little while, but he would die pretty soon. And I gave him a series of case. I am sorry to say that the particular case I am telling you about did die. He went back to his meat eating and his old habits, and in six months he was dead. He had a relapse. He intended to come back, but he didn't get back quite quick enough and he died. But several other cases I reported to him about the same time, are all alive today. One of them was a pretty bad case, one of the worst cases I ever saw, and yet he is alive today, and a lecturer, traveling in the east lecturing, and is a very successful and very able and energetic man. There have been many other cases. These cases were considered incurable, and they were, because under the old idea that meat was necessary to make blood, they were always fed meat, and the more meat the worse off they were, you see,

continually. It was the very thing they didn't want. We have come to the point where we know perfectly, and we know it scientifically, we don't know it simply empirically, but we know it scientifically, that meat is absolutely unnecessary as a food for human beings; that it is absolutely non-essential; that we can not only get along without it, but we can get along a great deal better without it than with it, and I was very glad to hear Mr. McClure say here tonight that he had been traveling throughout Europe, and he had found there that the scientific men generally were discarding flesh food. They have tried this drug and that drug and the other drug to cure various things, and now are finding that the meat diet and the autointoxication which results from it, the putrefactive processes that are going on in the intestine continually and throwing poisons into the body in great quantities,--that that really is the great cause of chronic disease, and is responsible for more chronic diseases, probably, than any other one thing.

I was reading today an article sent to me, a report of a paper by an eminent eastern physician, on the increase of insanity. Attention was called to the fact that down in the City of New York at the present time, one person in every 334 is insane. Now, think of that. One person in every 334 is insane, and is shut upx in an insane asylum. And the writer quoted other authority besides himself that for every person that is shut up in the insane asylum, there is another one outside that has not been caught yet, that has not been shut up. So that the number of insane people in the City of New York today is about one in every 150. One man in every 150 is an insane man. When one reads the newspapers, especially during the political campaigns, he is inclined to think there are more than that.

Well, now, what is the cause of this? There must be some great cause. It has been shown very clearly that the increasing insanity has gone right along

with the increase of city population. And you know that alcohol has a good deal to do with it, and dissipation has a good deal to do with it; but about half of these cases of insanity are accounted for by dissipation and by certain diseases that result from dissipation, and alcohol--that qccounts for about half the cases; but there is another half not accounted for, and this half, I am satisfied that flesh eating is very largely responsible for. It is especially noticeable that within recent times there has been a great increase in the number of cases of paresis, ~~kk~~ or general paralysis of the insane, as it is called. Paresis, in which there is a degeneration of the brain, the most hopeless and absolutely incurable form of insanity,--that that has increased enormously within the last generation. Now, that is a disease which comes on sometimes in very old age as the result of senility; and Metchnikoff has shown that these senile changes which are practically identical with those that come with general paresis,--that these changes are the result of these poisons circulating in the blood; and those poisons are absorbed from the colon. Now, we know that the great cause of these dangerous germs in the colon, these poisonforming germs, is flesh. Why, ordinary ox flesh contains--think when we eat it,--a little morsel of sausage, for instance, not bigger than the end of my thumb, has in it as many as 600 millions of germs, 600 millions, and anywhere from 100 to 500 or 600 millions are the number of germs to be found in every morsel of meat you eat. You can not find such a thing as a morsel of meat that has not germs in it, unless you kill the animal and cut off a piece of warm, quivering flesh and eat it in that shape, eat it directly after it is killed,--if you are going to get it clean and pure and free from germs, you can only do it in that way. These are the germs that cause putrefaction. That is why ~~tkarx~~ they are in the meat. Let them grow a while, and the meat will be putrescent. They always do grow a little while; and that is why the meat is tender. So-called prime beef is meat that is rotten.

That is why it is tender. When an animal dies and rigor mortis occurs, and the muscles and the limbs become stiff, that is rigor mortis; and when this occurs, the flesh becomes tough. In its normal live state the flesh is tender. Why, when a surgeon is operating upon a living tissue, he has to be very careful or he will bruise and tear and crush the flesh. You can take the flesh between your thumb and finger and crush it jmx it is so very tender; but when rigor mortis occurs, then the flesh becomes hard and tough and leathery, like, and it never becomes tender agin until it rots. That is why it is tender--because a process of decay has been set up and has progressed a little ways. And I think it was Dr. Wiley who said that a turkey to be really good and fit to be eaten it should be hung up by the head outside the door on the sunny side of the house and it should hang there until it drops off of its own weight; then it is just right to eat. But when it has reached such a state as that, it is very far advanced in decomposition, and those germs taken into the alimentary canal, fill the intestine with these putrefactive agents so that every little fragment of food that is not in itself putrescible finds there those agents in very great numbers, and they seize upon it and destroy it, and convert this good food substance, these good properties, even though it were not meat,--even the protein of vegetables is converted into poisons, and these poisons absorbed into the blood produce a vast amount of mischief.

Chronic diseases of so many kinds can be traced right back to that origin. The majority of people are suffering from this autointoxication,--sedentary habits,--indoor living, concentrated diet, together with the meat eating habit, brings about a state of things as bad as you could possibly imagine, so that we see almost everybody showing evidences of autointoxication.

Now, here are some of the symptoms of it: a coated tongue. Now a person would not have a coated tongue unless his blood was unclean. Let a dog

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show his tongue. It is clean, unless it is a very old dog. Ask the cat to let you see her tongue, and it is wonderfully clean, and you notice the cat lapping up milk--what a nice, clean tongue it has, and you wish you had a tongue as clean as that. I have often said, when I have seen a cat lapping up milk, "I wish all my patients had as clean a tongue as that." Now, why does the cat have a clean tongue? Because she has clean blood--that is the reason. The blood pours out the saliva, the saliva is formed from the blood, and when the blood is healthy, the saliva contains substances which render it impossible for germs to grow in the mouth. When the blood becomes impure with these poisons that are absorbed from the colon, then the saliva no longer has the power to keep the mouth clean; or no longer has the power to prevent the growth of these germs, and so they will grow and develop.

Now, you know it is possible to sprinkle something over the soil to prevent weeds from growing. It is possible to do that. It is possible to cover over the walls with a disinfectant solution so that mould can not grow. That is what you do when you whitewash your cellar and the stables. The reason for the whitewash is to put something onto the woodwork or the stone work that disinfects the wall, so that the germs and the moulds can not growthere.

Now, then the same thing is true of the mouth. The blood pours into the mouth a disinfecting saliva which makes it impossible for the germs to grow and develop there, and that is what keeps the tongue and mouth clean. Now, when the germs are allowed to grow, then the teeth begin to decay. If you have got a coated tongue, you may be sure your teeth are going to decay, because the germs that cause the decay are swarming there in great numbers; but it is not simply on the tongue; it is down in the stomach; it is in the colon where there is a vast multitude of these germs, and not only there but in the blood itself; because it is now known that these germs are circulating in the

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bloodd all the time, and when a person dies or when an animal dies, just before death, just in the last moments of life, these germs xix swarm into the blood in great numbers and are carried by the blood into all the blood-vessels everywhere, so they are found in the tissues everywhere, and the result is that the flesh of a person or an animal twenty-four hours after death is found completely filled with bacteria, millions of them. This was proven something like fifteen or sixteen years ago by some eminent German bacteriologists who made a careful study of them. They found that when an animal died under the best possiblie conditions, within twenty-four hours or forty-eight hours, or seventy-two hours, it was found to be completely filled with bacteria everywhere. So you never can eat a morsel of meat or flesh of fowl, chicken or anything else that is not already filled with bacteria; and the kind of bacteria that produce thm very deadly sorts of poisons, that make headaches and make various other mischiefs.

I found today a gentleman suffering very badly from neuritis, and there isn't a particle of doubt in my mind as to where he got it. It came from poisons absorbed from his colon that produced this disease known as neuritis. We see people going around wearing upon their very faces evidence of autointoxication--that brown coloration of the skin. You used to have a fine, clear complexion, roses on your cheeks, and a nice, clear skin. Why haven't you got such a skin now? Because your skin is painted, it is dirty, and the dirt is more than skin deep. It is not on the surface of the skin. It is in the skin, and it is not only in the skin, but it is all through the body.

Now, you sometimes see hanging up in the butcher shop an animal, the flesh of which is golden in color. That old ox had jaundice when he was killed. That isxwhyxyx why that flesh has that yellowish color, and he very likely had gallstones too. It is a very common thing to find gallstones in the butcher shop. The last time I was in Paris, I called at the big market and

bought half a dozen gallstones and brought them home. They collect them over there and sell them. The Chinese use them for medicine, and they often sell them to the Chinese.

Now, the flesh of that ox--if you could see the ox when he was alive, you would see his eyes were yellow just as yours were when you had jaundice. When the ox was killed, his flesh was just as jundiced as his eyes. The yellow color was everywhere throughout the whole body. Bile is only one poison. It is a poison that has coloring matter; but there are other poisons worse than bile, and when these poisons are in your mouth and the mouth has a metallic taste because of those poisons getting into your stomach and circulating in the blood, profucing gastritis, ulcer of the stomach, sour stomach and acid stomach and so on, and when you have these troubles, it is because there are poisons everywhere throughout your whole tissues, and some of these poisonous matters have coloring matter like bile in them, the same or similar coloring matter. One of the coloring matters produced by this decomposition in the intestines is known as Brenz Catechin, and this Brenz catechin is a brownish coloring matter and that is produced when protein is decomposed in the colon, when animal protein is decomposed. It is not produced when vegetable protein is decomposed, but when animal protein is decomposed this coloring matter is produced. This coloring matter is deposited under the skin, and that is why the skin becomes brownish in color and why there are dark circles around the eyes, and you have the kind of complexion you have. There is nothing of more value here in this institution than to see how people bleach out in this institution.

Some time ago we had a visit from Mr. Jacob Riis. He came at night, stayed over night and the next morning, and he looked about, and just before he left, he said, "Doctor, you know I have changed mymind since I came here. When I came up and went around the institution and looked about among your people, I thought these people look anemic, and I am afraid they do not have beefsteak

enough; they look pale; but this morning, after I got to looking about and getting a little more acquainted, and looked closer, I saw that I was mistaken; it is a clean look." Now, my friends, that gratified me very much. I was very much pleased to see he had changed his mind and had a reason for it. It is a clean look, and why? Why, because a clean diet builds a clean body, makes clean blood, and when the blood gets clean, it gets back its old vigor, and its old vitality, and its old healing power. You know the old prophet, Moses, said, "The life is in the blood." "The life is in the blood"; and that is the reason the Jews were not allowed to eat the blood or to use it; and by the way that proscription of blood eating applies just as much to the Christians as it does to the Jews. You see when you read on further in Deuteronomy, or Leviticus or Numbers--I guess it is in all three places,--you read there that the blood must not be eaten. You read it in Genesis too. In the ninth chapter of Genesis when Noah came out of the ark, he could not find anything else to eat, and he was given permission to eat animals, all kinds of animals, remember, creeping things too--everything that moveth, every living thing that moveth Noah was permitted to eat; he was just as much permitted to eat the grasshopper and the snail or the toad as any other creature. Everyliving thing that moveth he was permitted to eat. This is the statement;"but the blood thereof, which is the life thereof, thou shalt not eat of it." Now, that was said to Noah, the father of the whole human race. That applied to every one of his descendents as well as it did to Noah. Then when we came down to the time of Moses, Moses reiterated that to the Children of Israel, "The blood thereof, which is the life thereof, thou shalt not eat of it."

"What has that to do with us?" we say; "we are not Jews." You read there that the blood must not be eaten. You read it in Genesis too. In the ninth chapter of Genesis, when Noah came out of the ark he could not find anything else to eat and he was given permission to eat animals. When Paul went up

to Jerusalem to settle the theological controversy which arose between him and Peter, he put the matter before the council, and one of the questionsxx was how far the old laws under which the Jews lived, applied to Christians. Paul did not think very much of those old, Mosaic laws, and Peter did, you know, at least some of them; so the thing was submitted to the council at Jerusalem, the great synod, if you please, the first one, and James, who was president of the council,--and he was the brother of Jesus Christ,--James after two or three weeks deliberation, James made this verdict: "It seemeth good to the Holy Ghost and to us to lay upon you no other burdens than these four xxixgx necessary things--to abstain from flesh offered to idols, from things strangled, from fornication, and from blood." Now, that was in the Christian dispensation. That was the brother of Jesus Christ, the president of the first council, if you please, and it was pronounced after deliberation and careful study of the question, and if you have got a copy of Adam Clark's great commentary, which is one of the best commentaries,--and you will turn over to the ninth chapter of Genesis and note his commentary on that subject, then turn over to the Galations and the Acts, the 15th chapter or somewhere about there, and note his commentary there, you will find he devotes six or eight of those great pages of fine print to a presentation of this question; and he takes the strongest kind of ground against the use of blood, and declares that the use of blood is just as sinful for a Christian as for a Hebrew in the olden days, and is equally forbidden to the Christian--just as much as to the Hebrews, and by divine command.

Now, there is a good reason for that. Blood always contains impurities. All of the impure excretions of the body are derived from the blood. There was a symbolic reason--the life was in the blood, and the xhxx physiologist today xxxxxxxxx recognizes that the life is in the blood. John Hunter, the great anatomist, 100 years ago made this very interesting experiment. He cut the nerve

going into a part so that the part was paralyzed. He cut all the nerves of a dog's leg, and the leg was paralyzed, but remained alive, was warm, and the circulation kept on just the same as before. Then he made another experiment. He cut all the blood vessels going into the limb, and immediately the limb became cold. And in a little while it died, and fell off. So John Hunter showed that the life is in the blood; it is not in the nerves, but it is in the blood, and it is a matter of particular interest to the sick man, because this life in the blood is the thing that heals. Healing power, as my friend Prof. Winternitz, has said with so much emphasis, the healing power is in the blood. It is the blood that heals. It is the blood that creates.

Now, here you have got a wound, cut a little gash in your flesh here, and that at once fills up with blood. Now, if you could put that under the microspope and look at it, you would see that the bloodclot was made up of minute threads and fibers running all through it, and on each little fiber you would see the white blood cells creeping out and beginning to build, and building a false work first to bridge that chasm over, and that is what those fibrils are for, for food; the blood that is put out there is fed by these blood cells that creep out, the blood vessels send the blood in there to buid a bridge, to bridge over those parts.

Now, the same thing that can heal the outside can heal the inside. If there is an ugly ulcer here, by taking particular care of it, we should expect to see it healed. Tear off a bit of skin, and we see it grows on again. And it is this blood, this living blood in the body that does the building.

Now, the same things happens inside of the body. A man some time ago was here who had ulcer of the stomach, and we wanted me to take his stomach out. He said, "Doctor, my old stomach has made me so much pain, I want to get rid of it. I have heard that you ca remove stomachs, and I want you to take my

stomach out." "Well, why should we take it out?" "Well, I have been trying for years and years to get rid of this oldxxulcer there and I can't, and I want you to take it out." I said, "Now, why? If you had an ulcer on your hand would you come to me and ask me to cut your hand off?" "Why, no," he said, "I would expect you would put something on it and heal it up." "Now, we would put your hand to rest, wouldn't we, and give it a chance? Now, we must do that with your stomach. The ulcer inside of the body can be healed just as well as an ulcer outside of the body, if we give it proper conditions, because the healing power is in the body itself.

Now, I feel that that is the greatest principle we have in this institution, that is the healing power, that the healing power is in the man, and it is the same power that made him. The same power that made the man in the beginning, that same power is right with him now. Now, we xxx think sometimes, I suppose, that away back in the beginning somewhere there was a great power exercised and man was created, and set going like a clock, and after that he was allowed to take care of himself. John Fiske, the historian of Harvard, once said that his idea when he was a boy was that God set the universe going, and then went off somewhere and sat down to see it go. Now, that perhaps sounds like almost an irreverent remark, but I am telling you what his idea was; but you know, I think many of us have a sort of notion of that kind,--that the Creator of all things does not have very much to do with things nowadays, only to sort of watch and see if he can get a chance to catch somebody doing something that is not right, and then hit him some way or other. People have that conception. Why, my friends, it is utterly wrong. I was very much impressed with the idea once when in Chicago. For seven years I spent every Sunday of my life working in the slums down there, getting acquainted with that class of people to see if we could do something to help them. We started a little mission that we have

going there yet, though I don't visit it as often as I used to.

I met one day on the street a poor fellow who was growling and seemed in a very savage state, and I touched his elbow and asked him to come in; thought I would try to do something to sweeten him up. He was a poor, ragged, dirty old fellow, and he turned upon me with fury, and I didn't know what he was going to do to me. He said, "I don't want anything of anybody." He said, he had just passed a man he used to know on the street; that is what was the matter with him, and he spoke to the man and the man did not speak to him, and he told me about it. He said, "My old employer is agin me; my wife is agin me; my neighbors are agin me; and God is agin me." I shall never forget how he looked, and the tone of his voice when he spit that out in such a spiteful way,--"God's agin me." The man really believed it, and he made up his mind that God was against him. A whole lot of people think just that way.

I met a poor woman the other day who was just in despair because she thought she had committed some unpardonable sin; it must be, she said, because she suffered so, and she knew God would not afflict her in that way and punish her so unless she had done some unpardonable thing. I looked at her tongue and told her her case was a case of total indigestion and not of total depravity, as she thought, and the thing she had to do was to get her tongue clean, and she would feel different, so she did.

Now, I want to get this doctrine clearly in your minds, my friends--that the very same power that made us in the beginning is with us still. The power that made us is with us. How do you know that? you say. I know from my knowledge of physiology that it takes just as much creative skill to keep a man alive as it did to make him; because the creative process did not stop when the man was made. The man is dying every minute. He has to be recreated. Why, did you know that there are eight million blood cells dying every second of our lives? Every time the clock ticks, eight million gone--eight million more--tight

million more,--just think of it,--how long does it take to make a billion, going off at that rate? Eight million every second of our lives. The blood would all be gone in a few weeks, every drop of it, if it was not being created as fast as it is destroyed. Blood cells live about six weeks, grow old, die and disappear. New ones must take their place; so eight million new blood cells are created, spring into being every second of our lives. So the creative process is still going on, don't you see. Outside we do not see it. It is not visible to our eyes, but it is going on. Why, I saw a wonderful creation last year. I saw a man take a bag of corn out on his shoulders a year ago last spring. He went out and planted it in the ground,--100 lbs. of corn, and in the fall he had to go out with teams and wagons to haul that corn back; he had four hundred bushels then. He had four thousand pounds for that 100 pounds he took out--two tons of corn--more than that. He had forty thousand pounds of corn for that 100 pounds. Where did that corn come from? It didn't come out of the ground. He planted the seed in the ground, but the seed grew up and gradually developed. And creation went on right there before his eyes, and he had 400 pounds for every pound he carried out. Four hundred kernels for every kernel he carried out, and all that corn had been created. So this xxxxxxxx creative process is going on about us all the while, and that is the power that heals.

I want you to get that thought, so you will not depend on me. I was led to make these remarks because I felt that Mr. McClure had made a mistake in holding me up as being anybody of any account. I can't do a thing. I go up here in the operating room, sometimes, and cut people up on the table in a horrible way, and if they were left where I leave them, my friends,--I say every time when I leave the operating room, "If these patients were left the way I get done with them, there would not be the slightest hope of one of them getting well; and I am glad, I tell you, when I go away from my operating room, and I turn my face towards home, and sometimes with a very anxious heart, I am so

glad that there is a power that can create; that there is a healing power that can bind up those wounds I have created. If it was not for that thing I would never dare do a surgical operation again as long as I live,--if I didn't know that thing; and I believe that thing, and that is why we always invoke that power to help us, not expecting any special favors, but because we want to come in as close touch as we can with this healing power; we want to keep in as close touch as we can all the time; so I say to you, my friends, the best way to health and the quickest way to health is to just get in line, get in harmony, get in union, in sympathy with the great power that made us; as somebody says, get in tune with the universe. That is a good thought, and a good way to express it--to get in tune with the universe, because there is a power keeping everything in order, keeping everything in tune.

Now, Mr. McClure said a little while ago that I do not get any pay for my work. He is entirely mistaken. My friends, I get the biggest kind of pay. When somebody goes into my office just before he goes away,--a patient, a sick patient that came here, a poor, cadaverous looking patient, with leathery skin, great brown circles around the eyes, luster all gone, comes in with tottering step, and afeeble voice, and says, "Doctor, can you help me?" and I say, "Yes, there is help for you; I can not cure you, but there is a power that can cure you; there are principles that will help you; and when the patient comes back again after eight or ten weeks in my office to say good bye, and I see in his clear skin, blooming cheeks, bright eyes, and springy step and cheerful voice,--and I see this patient going home as well as ever, and the patient says, "I am so thankful for the good I have got here in this institution, and I want to thank you for what you have done, "I want to say to you, my friends, that is big pay, that is big pay, and I see faces as I stand here and look into your faces, I see faces I recognize that a little while ago were pictures of disease, and today

I see health blossoxming out. I am glad I am here. I want to tell you it pays, it pays to be xxxdx connected with principles that are so mighty, that have healing power in them; and I hope while here you will get so inoculated with these principles of right living, and right living is not the Battle Creek idea at all; we use the name Battle Creek idea and Battle Creek system, etc., because we have to have something to lay hold of, and it is handy to pass around as a sort of handle; but the real truth is that these principles are eternal; they came down from away down at the beginning of time; and we are simply endeavoring to associate together xxxx as many of these principles as we can get a knowledge of, and to systematically apply them; and most of all we are doing our best to win converts to these principles.

I hope those of you who are here tonight and find yourselves getting help--I trust when you go home you are going to bex missionaries and tell your friends about these good things,--how much good they have done you, and that you will go into their homes and labor with them, exhort them, if you please, proselyte them, do your best to get them out of their old ruts; and if they see that something has happened to you, that you have been helped, blessed and benefited,--and see that you don't backslide-Thanksgiving day is coming one of these days, and that is an awful backsliding day. Turkeys are very enticing sometimes on those days.

I am going to tell you a turkey story now to help you get over Thanksgiving. A little nephew was invited out for Thanksgiving, and it was the first time he ever saw roast turkey. He was a little fellow six years old. He said, "Why, that looks like a dead turkey." And the lady said, "Yes, that is a roast turkey." "Do you eat dead turkeys?" "Why, yes, roast turkey is very nice." She passed him a piece and asked him if he would not have some. "Oh, no," he said, "I wouldn't eat dead turkeys." But then the lady thought she would be very good to him, because he would not eat any meat, and she thought some of

the stuffing would be very fine, so she began raking out some of the stuffing from the turkey's interior and placed it before him, and he looked up with great surprise. "What", said he, "What, do you eat what the turkey ate?"
Good night.

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THE NEW HYGIENE

A Stereopticon lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, September 1, 1910, at 8 p.m.,

By

J. H. Kellogg, M. D.

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About thirty-five years ago the health officers of New York became so notoriously ignorant because of the fact that they received their appointments through political influence rather than through civil service examination, that some of the young doctors protested, and they demanded an investigation, and the governor appointed a committee to investigate the health officers of New York. The head of this commission was President White, of C ornell University. President White gave a report of it which was published in the Popular Science Monthly about 32 or 33 years ago. He said they asked one of these officers what had been the prevailing diseases in his neighborhood. "Well," he said, "We have had a few cases of measles, several cases of whooping cough, and three cases of small-pox." "Were they contagious?" "Well, I don't know; I didn't go to see." "Why not?" "For the same reason you wouldn't go yourself--I was afraid I would catch it." "Well, do you know anything about these cases at all? Did they get well or did they died?" "Well," he said, "two of them died and one of them got well."

The next man who came in was asked several questions. The first man said that the person who ~~died~~ got well of small-pox was in a family of hygienics, and that case got well. The second man was finally asked this question: "Have you

got any hygienics in your neighborhood?" "Yes," he said, "we have had two or three cases, but none of them were fatal." And to the next man he said, "Please define "hygienice'." He scratched his head a moment and he said, "Hygienics, sir, is a bad smell arising from dirty water."

Now, I think that 35 years ago the general impression was that hygiene related to bad smells, to dirty water, to typhoid fever germs, etc. But within the last generation there has grown up a new hygiene, a hygiene which includes a vastly greater scope of subjects. It has been discovered that that old hygien which related chiefly to public health, the sewers and general improvement of city conditions, etc., while this was indispensable and inevitable, that it is insufficient, and that it is not capable of staying the downward tide of degeneracy. As people are gathering into the cities more and more and more, we find that mortality is increasing; that while the urban population is rapidly increasing, the mortality is increasing with it, and diseases are multiplying, and something more must be done.

Some 32 or 33 years ago I was appointed a member of the state board of health of Michigan; I was a member of the board for twelve years, and I traveled about the state to sanitary conventions inaugurated by the board, and I made it a point at every place I went to lecture on the question of race degeneracy, and to tell the people that we are going down hill, and that we are bound to go down hill unless we do something more than we are doing. While we are talking all the while about public hygiene, and about keeping away cholera and the black death, yellow fever, and small-pox and typhoid fever, it is true that we must do something more, because in keeping away these great maladies, these great plagues, we were keeping a lot of feeble folks alive. When the yellow fever prevailed at Jacksonville some years ago--some of you are here from Florida and you remember about it,perhaps you were on the ground,--the newspaper correspond-

ents telegraphed from Jacksonville, "The drunkards are dying off like flies." When the choldra prevailed in Tunis ~~xexarxk~~ 150years ago, the same word went out,--"The drunkards are dying off like flies." Whenever there was a great epidemic of that sort it carried off the feeble people, the degenerate people, so these great plagues acted in a certain way as a means of securing the survival of the fittest, as a means of weeding out the people that were not fit to live, the people whose habits had produced degenerate conditions so that they were not really fit to help the race. Now, by keeping away these great epidemics, we keep all the feeble folks alive, you see. The dyspeptics who would be carried off by typhoid fever would be kept alive. The man who has a good stomach can drink all the typhoid fever water he wants to, if his stomach is good enough. The man that has a thoroughly good stomach can drink water infected with cholera and it does not hurt him. Don't try it now, because I am suggesting it, for very likely your stomach is not good enough. But Prof. Brieger--I think it was Prof. Brieger,--when Prof. Koch discovered cholera germs, made sport of the matter, but to prove Prof. Koch's so-called coma bacillus, cholera germ was a hoax, as I said,--to prove it, he cultivated in his laboratory a pint of cholera germs. In a pint of beeftea he inoculated the beeftea with cholera germs, and developed the billions and billions of cholera germs there, and he swallowed the whole of it, and he did not feel any inconvenience whatever. Why, there were cholera germs enough in that decoction to infect a whole community if it had been put into the water and distributed throughout a community; unquestionably they might have had thousands of cases of cholera; but he didn't have the slightest inconvenience. Why? Why, because he had so much gastric juice he was able to disinfect them. A man that can not digest germs has not got a good digestion. A germ is just as digestible as a mushroom; it belongs to the same family as a matter of fact, and if you can digest mushrooms, you can digest germs. But you don't always digest mushrooms. The difference between the mushroom and

the germ is that the mushroom does not take root and grow if you don't digest it; it simply goes on as so much rubbish; but if you don't digest that germ, it is going to take root and grow, and multiply by billions. So the germ is more dangerous than the mushroom. I would not advise you to try any experiments with germs; but the man with a dyspeptic stomach is the man that is subject to typhoid fever. When typhoid fever appears in a community, it is not everybody that has it. When yellow fever came along, it was not everybody who had yellow fever. All might be bit by yellow fever mosquitoes, and all might swallow typhoid fever water, and yet all would not die of them. It is the feeble ones that are inoculated with typhoid fever germs, with tuberculosis germs, ad with various disease germs that come along,--it is the feeble man, the feeble infant that are carried off; so keeping these feeble people alive by keeping away these great epidemics has the effect, you see, to weaken the stamina of the race, and this fact has come to be known. Scientists who are studying the science of eugenics have come to see that it is necessary that the individual man must be improved; that we must do something more than improving the conditions of life ing general, because improving the conditions of life, is just like keeping the frost off the garden and keeping the feeble folks alive. When the frost strikes the garden, it is the feeble plants that are killed by it. The strong, hardy plants are able to survive. Now, disease is a frost, so it is necessary to make the man frost proof, so to speak, to make the individual man so that he will be hardy, so he will be more resistant to germs, so that germs can not touch him.

Now, we have not been doing that, but we are beginning to see the necessity for it, and we have what may be termed a new hygiene, a new hygiene which relates not only to the community, but to the individual. We get acute diseases, but they are outside. If you want to get the small-pox, you have got to hunt up somebody who has got small-pox and rub yourself against him and catch it. If

you want to get the whooping cough when your babies haven't whooping cough, you have got to take your baby where there are some other babies that have whooping cough, and so give the child an opportunity to be inoculated with it from the other child. But we do not get Rheumatism that way. We do not get rheumatic gout that way; we do not get Bright's disease in that way; we do not get dyspepsia that way. The only way we get these chronic maladies is by cultivation. Acute diseases come from the outside. They creep in at the window. The old cat goes out and visits the neighbors sometimes and brings some infection home. The fly hunts up the ejecta of a typhoid fever patient that is dying across the road, then comes into your back door when you are just about sitting down to the table, and he puts a punctuation mark on that nice piece of brown bread you are going to eat, and you swallow it, typhoid fever germs and all. Now that is the way the germs are scattered about of these various kinds of maladies, and they come in from the outside, you see--the acute diseases; but it is not so with chronic diseases. Acute diseases come from without; but chronic diseases are a home product. We manufacture them at home. We raise chronic disease, cultivate it at home; we plant a garden of disease right in the kitchen and dining room and all about the house, and we carefully nourish these plants of disease,--typhoid fever, rheumatism, apoplexy, arteriosclerosis, and all these other horrible things that we do not like. We raise them right at home; we train them up like exotic plants and take the greatest kind of care to produce prodigious results; we plant great crops, and then when we get tired of it we hunt up a sanitarium somewhere, the Battle Creek Sanitarium maybe, and go there expecting to have all those effects rubbed out in a few minutes.

Well, now, I am going to show you a few pictures here to give you some idea, if I can, of what is going on in this great country of ours in cultivating these diseases at home. If we have rheumatism it is because we have swallowed it

it, because we have eaten it. Rheumatism is not due to climate; it is not due to bad air; it does not come from climate; it is not due to bad water; it is due simply to our own wrong diet, to our own wrong eating.

Now, here are a few statistics. Statistics look rather dry, but this is an encouraging picture. We start out with this. Here is a table which shows the decreasing death rate in the registration area of the United States, that is in that part of the United States where a record is kept,--of the deaths from specified diseases in 100,000 population.

In every 100,000 people in the year 1900, 50 people died of old age. In 1907, some 7 years later, only 32 people died of old age out of 100,000,--that is, each year. So you see we are improving, aren't we? We are getting on splendid aren't we? Not so many people dying of old age? Is that an improvement? Hardly, We will think about it a little further on.

Bronchitis 45; only 30 seven years later; paralysis reduced from 25 to 19; peritonitis from 15 to 7; tuberculosis from 180 to 158. We are learning to take care of persons who have tubersulosis so that they do not infect other people. We are learning how to cure tuberculosis by sending tubercular patients outdoors, so there are not so many dying. Pneumonia from 180 to only 120--diminishing somewhat. Enteritis 133 to 116; we are learning to sterilize milk so there are not so many babies dying. That is the reason we save lives from inflammation of the bowels. Typhoid fever 35 to only 30--an improvement, you see. We are learning to keep our water clean. In the old days a man went out west, built a little cottage, dug two holes in the ground behind the cottage; in one of these holes he put all kinds of filth of every description in one of those holes, and out of the other hole he drew the water which they drank in the family. What went into one hole came out of the other, you see. There was a pipe right in the kitchen where all the filthy water went down to one of those ho

holes and a few feet away was another hole out of which the water was drawn. I have found many cases of accommodations of that sort. We are learning better than to do that; we are learning to take care of our water supplies, to see that the water is pure.

Meningitis 40 to 26; gastritis, 14 to 10. So here are a few diseases in which there has been a decreasing mortality; but that is not the whole story. When you come to look at chronic diseases, to heart disease, and Bright's disease, and apoplexy, and cancer, and cirrhosis of the liver, diabetes, appendicitis, chronic debility, endocarditis, and maladies of this sort, we find that there is an enormous increasd. In fact, the mortality from chronic diseases has doubled in thirty years. What a terrible thing it would be if there was adoubling in a thousand years. Think of it, my friends, a doubling in thirty years; and in a century see what that would be. Now suppose it doubled again in thirty years more, that would be quadrupled in sixty years. Double again in another thirty years, and that would be in ninety years the mortality would become eight times what it was at the beginning. Now, I don't know any reason why it should not go right on doubling. The causes of these maladies are cer-tainly multiplying. Just look at some particulars here.

Heart disease, 111 in the United States, and in 1907 141 people dying--an increase of 27% in seven years. At that rate, you see, it would not be very long before it would double several times. Nephritis, Bright's disease, 86 to 105--an increase of 18 per cent in seven years. Apoplexy, 11 per cent; cancer 15 per cent in seven years; cirrhosis of the liver 22 per cent; diabetes 43% in seven years--increased nearly one half in even years. Appendicitis, notwithstanding all the increased skill of the doctors in operating to relieve patients--we have a patient up stairs now who came in night before last and looked as though he was going to die before morning; but we have saved his life

carried him through, and when he gets to a certain stage we will operate upon him. But if he had not got here just as he did--he got off the train going east,--he probably would have lost his life in another forty-eight hours he would have been dead. Notwithstanding we have learned how to master this disease to a considerable extent, the malady has increased 15% in seven years in spite of all we are doing, and all the lives that are being saved by physicians.

Congenital debility has increased 37%; endocarditis 20%. Now, if we should go on for fifty years, continually increasing at the same rate as the first seven years of the century, for half a century, you can see what the percentage of increase would be--almost 200% for heart disease, and more than 300% for diabetes, and 110% for appendicitis, 270% for ~~xongxxi~~ general debility. That is a disease which is increasing very rapidly. So it is not a very pleasant picture to contemplate, is it? It is an enormous increase.

I find in studying the statistics of cancer for the last fifty or sixty years that cancer has increased 800% in fifty years. The number of deaths from cancer per 100,000 has increased 800% in fifty years. The number of deaths per 100,000 sixty years was only nine; today it is 74--more than eight times as many. Now, in certain parts of the country, in New England, for example, in the older portions of the country, Bright's disease and other chronic maladies are increasing with far greater rapidity than in any other part of the United States or of the world. For instance, in Massachusetts, the increase in 30 years has been 105%. Apoplexy in Massachusetts, 135%, throughout the United States apoplexy has increased 84%. In Chicago disease of the kidneys has increased 267 per cent. That means that 267 people die today in Chicago where 100 died in 100,000 people thirty years ago. It is rather dangerous to live in Chirago, then, isn't it? I met a gentleman the other day and he asked me what I thought about Chicago as a climate for a person suffering from Bright's disease. He said he had Bright's disease, and he had been recommended to live in Chivago on account of the climate.

I was obliged to tell him the trouble was not with the climate, but the trouble was the habits of the people. Chicago is not such an unhealthy city, so far as climate is concerned. It has lots of pure air blowing off the lake all the while, but there are those great slaughterhouses there; meat is cheap, especially diseased meat is cheap. We had a gentleman here some time ago who worked at the stockyards for many years, and I asked him what his business was. He said, "Doctor, I don't like to tell you." But he told me confidentially, so I will not mention his name. He said, "I will tell you, Doctor, what my business was. You know there are a lot of cattle condemned there as being unfit to eat, and the officers condemned them, and put them into a certain pen, and my business is to watch my opportunity and drive those cattle into a certain lane to another place, and they are slaughtered at night and put into the canners. That is my business. I have been doing that for the last fifteen years. The best of the meat that is not so very bad is sent off down to the markets down town the next morning." That man was, I believe, an honest man; I think he was telling me the truth about it; there wasn't any reason in the world why he should not.

One time I was asked to visit a social settlement in Chicago. Graham Taylor asked me to talk to his people. So I met his people in a basement of a tenement building, and it was made up chiefly of men from the stockyards. A large share of them were from the stockyards, and I talked to them about meat, and told them some of the things I have told you here of the diseased condition of meat, and so on, and when I got through, half a dozen of those men were on their feet at once to give me confirmatory evidence. One of the men said, "I have seen that at the slaughterhouse"; another man said, "I have seen worse things than that." And it would have made your blood curdle to hear those men tell certain things that they saw down there at the slaughterhouses in relation to the condition of diseased meats, and disgusting, horrible things that were

daily occurrences, that they were in daily contact with and knew about. That is one reason, perhaps, why kidney disease is so frequent in Chicago. But in Connecticut it is pretty nearly as bad,--139 per cent; and in the whole registration area of the United States, kidney disease has increased 131%. 231 people die of kidney disease in the United States today where 100 people died thirty years ago. Apoplexy is 83% increase. Almost two people are dying of apoplexy now where one died of it thirty years ago. So the chances of a man dying of apoplexy are twice as great today as some years ago.

What are a few of the great causes of these things? Here are a few that I think everybody ought to be informed about. One is a horrible disease the name of which is almost unmentionable in polite society. Alcohol--that is one of the causes of insanity, and why we see these cases in men to a greater extent than in women. Now, in the cases of men, here are these two diseases. That is a disease of impurity,--19%; and alcohol is 17.5% of all cases of insanity in men. Putting these two together makes pretty nearly 40%, you see, or at least more than one third of all the cases of insanity in America are due to these two causes--alcohol and dissipation. In women this is ot so frequent--5% in one and 6% in the other in women. That is because they are not so much subject to these diseases as men. We see the reason why insanity has increased. Nowwithstanding all the improvements that have been made in behalf of prohibition, the amount of wiskey used per capita has more than doubled. It is terribly increasing in spite of all the efforts that have been made against tis great evil.

Now, this is city life, you see. Look at it here. Infectious diseases causing 22 and alcohol 18 per cent in the cities, and 14% in the country. In women in the country only 1% and 5% in the cities. So you see mental diseases to which country women are subject are due to other causes. Now there is a good reason why these causes should operate so in producing insanity.

Now, this represents a healthy, normal nerve cell. These are nerve cells in the dark portion of the brain. Here is a nerve cell deep down in the brain. Here is one of them spreading out these fibers in the upper part of the brain, on the surface of the brain, running deep down to the brain, then sending out branches, which connect with other cells. This contact with other cells is made by means of great numbers of little buds found all along on the sides of these twigs when they are examined under the microscope; and these are means of contact. These long filaments, of which we only see just a few--there are millions and millions of them,--these make contact with other nerves by these little buds. When you are trying to think of something and can't, it is because you do not make the right contact. You are trying to push up and down, and it does not make a good contact. When you are trying hard to think, you are pushing back one hundred little fingers, you see, in the brain, and they are reaching out trying to come in contact with the buds where the idea you want is located. And when you can not quite make that contact, you can not get the information you want. When the wires are cut on the telephone, you can not get any communication.

Now, look here and see what has happened. Here is a healthy nerve cell. It looks like a tree, you see, with branches. That is called a Purkinje cell, and it is found in a certain part of the brain. Here is a cell of a man that has used alcohol. See how these little twigs have been destroyed. This looks like an old tree that had been wrecked by a hurricane. The leaves and twigs are all torn off. It is no wonder that man's memory is gone, because his thinking machine is so much impaired. His nerve cells are actually destroyed. And it is not only alcohol that does this, but the poisons of infectious diseases will do it. This horrible scourge that is the penalty of impurity, of immorality is the cause for this very thing, and that is one reason why we have so many

men in cities that are going to the insane asylums--because of general paralysis, because of paresis as it is called, general paralysis of the insane as it is sometimes termed. As high as 85 per cent of all cases in some asylums, especially city asylums and asylums near cities, are due to this thing, to general paralysis of the insane, and that is caused chiefly by dissipation, by the use of alcohol and of other things besides alcohol, and tobacco has something to do with it.

Tobacco is one of the greatest scourges of the world. There is no doubt about it. The strangest thing in the world is that we should be using tobacco, isn't it? Dr. Seaver made a study at Yale, and Dr. Hitchcock made a study of the students at another university. They tested their strength, took their weight, measured their chests and their height, and ascertained all that could be ascertained about their development, then watched them y ear after year, and theyput the smokers in one class and the non-smokers in another class, and we see here some of the results. This shows the growth in weight of the smokers. They increased during that four years of observation,--this represents the amount they increased in weight, and this represents the smokers, and you see that the non-smokers increased in weight twenty-four per cent more than the smokers did, and it shows they increased in development. The non-smokers increased in height 27% more than the smokers did. I hope these boys will notice that, and you will see that if you want to gow tall, you must not smoke, because smoking dwarfs the boy, stunts him. Alcohol does the same thing. Perhaps you have seen puny little dogs in cities, and minute little creatures, and perhaps you do not know that they fed them alcohol when they were very small puppies, and it prevents the proper growth of their bodies, so they are dwarfed by that means.

An experiment was made some years ago by a committee of fifty. One

of its sub-committees in studying alcohol, studied the effects upon dogs, cats and other animals, and it was found that puppies were always dwarfed when they were given alcohol. Now, here are the chest measurements of the smokers and the non-smokers. Those smokers exercised their lungs in puffing away at pipes and cigars, nevertheless their chests developed less than the others. You see the chest capacity of the non smokers was 42% or nearly half more than that of the smokers. Now that is a very significant thing. Men recognize this; they look at it and they say, "Now, that shows that tobacco is not good for boys, and boys should not smoke until they are grown up." The father says, "You should not smoke, my son, until you are as old as your father was when he began to smoke; then you may begin to smoke."But the boy says, "Now, then, if smoking is good for father, I can't see why it should be so very bad for me. It may not be a very nice thing to do for a boy; but nevertheless, I don't think it can do me any very great harm, because if it hurts a boy a great deal it ought to hurt a man some, and if it hurts a man a little, why that is all. I only smoke a little, and if it hurts a man only a little when he smokes a great deal, if I smoke just a little, it won't hurt me any more than it hurts my father. A little smoking won't do me any more harm than a great deal of smoking does my father." So the boy makes an argument, and he goes on with his smoking on the sly, and by and by gets the habit and then becomes a cigarette fiend.

How in the world did we ever get this smoking habit, anyhow? It is purely an American habit. It originated with the savages of America. Civilization has made only one improvement in smoking. When Columbus discovered America he sent his men ashore to explore, and they came back and reported that they saw naked savages twist huge leaves together and smoke like devils; and since then a large proportion of the civilized world have been imitating the habits of the savages and smoking like-- well, I won't say anything more about

that; but Columbus reported that in his logbook, in the history of his voyage, and that is where cigars originated. On a certain island in the sea he found men who made long pipes made out of clay, and they put the leaves in one end and smoked them, and that island was called Tobago because it was shaped like that pipe. That is where the pipe came from. And a Catholic priest who was with one of the expeditions that went a few years later, said that he saw the savages there rub the dried leaves of a certain plant up between their hands then snuff it up into their nose; then he said they acted as though they were possessed of the devil; they went about sneezing, he said, and behaving as though they were possessed of evil spirits. Those are the three common methods of using tobacco. But there was another method in use on the coast of Peru, When the Spaniards went there to accomplish the conquest of Peru, they thought they were going to have an easy time because they saw the savages coming down to meet them on the shore, and without any arms. They were chewing something in their mouth; they came along without any weapons of any sort in their hands, and they said this was going to be a very peaceful conquest; but when they had reached within a few feet, each one of those Spanish soldiers received something in his eye. Those men were tobacco chewers, and they expectorated a quantity of tobacco juice into the eyes of their enemies; and that was their mode of defense. There are some tobacco users whose vicinity is just about as dangerous as that of the Peruvian Indians; but there is only one really American improvement or invention in the use of tobacco. We are imitating savages in using tobacco in all but one particular. Some poor ignorant women in the mountains in the South, poor, ignorant creatures who never had a chance, invented the habit of snuff dipping,--chewing up the end of a stick and rubbing it in the snuff, and then rubbing it on the teeth. That is the only invention that has ever been made that I know of, by civilized or semi-civilized people in the use of tobacco; so

in using tobacco, we are only imitating those horrible, ignorant creatures, the American savages, and everybody knows it; for if you go down the street and look out for a tobacco shop, what do you expect to find for a sign? It is an image of a dead Indian, isn't it? Every smoker is burning incense to the dead Indian.

Now, there are some other causes of increasing mortality from chronic disease. One of the insidious causes which is at work at the present time is th the degeneracy of mothers, thex incapacity of mothers to care for their children. Prof. Bunge, of Basle, has made a very interesting study of this point, and he has called attention to the fact that the mortality of xexxxxxxf breast fed infants who are properly nourished during the first year is only 7%. That is enough; that is tremendous; whereas the mortality of bottle fed infants is 50%,--seven times as great. Down in New England almost half the mothers are not able to nurse the children, and have to bring them up on bottles. At the present time there are doctors whommake a specialty of that subject--how to feed babies on bottles, and there are great laboratories in our great cities that are devoted entirely to the preparation of milk to be fed to babies in bottles, and there are enormous great factories, enormous great commercial enterprises for the purpose of manufacturing food for bottle fed babies. The maternal font has dried up, and it is because of the degeneracy of woman. A girl baby that is bottle fed will have to feed her baby with a bottle. She does not get a real, normal development. Civilization has made a wet nurse out of the cow for the whole family, and the cow can not furnish the kind of nourishment that is needed to start a human being off in life as it should be started.

Now, we have a graphic presentation here which has been prepared by the president of a life insurance company, the Provident Life Insurance Company of New York City, has prepared these graphic representations of the increased of mortality in certain diseases. For instance, in Chicago see how it has increased

creased from 1880 up to 1906--an increase of 129% in kidney diseases. An increase of heart disease of 57% between 1880 and 1908. The natural result of this is that the mortality of persons advanced in years is increasing because chronic diseases pertain chiefly to people of advanced life.

Now, we found a little while ago that people dying from old age, the number of them is diminishing. It diminished from 50 to 35 in seven years. Now, you see the reason for that. It is because there are not so many left to die of old age,--that is the reason. It is because they do not live to be old enough so they can die of old age. A man dies of old age only when he ~~xxx~~ is old. A man has got to be old in order to die of old age. You would not say a man dying at forty or fifty years of age died of old age,--or twenty years. A man has to live until he is seventy or eighty before he dies of old age. He could not die of old age when he was a young man still. So there is a good reason why the number of people dying of old ~~age~~x shows less in the census reports. In Massachusetts it has been found there is a great decrease in mortality between the ages of 20 and 30. Persons under thirty years of age have a better chance to live in Massachusetts today than they did thirty years ago. For instance, you see here the mortality between twenty and thirty has decreased forty-one percent. Between 1899 and 1907, in 27 years, there has been a decrease in the mortality of those ages. That is in the younger age between twenty and thirty. Between thirty and forty, the decrease has been fifteen per cent in 27 years. Between forty and fifty, however, we see the thing is reversed. There has been a steady increase in mortality after the age of forty years since 1880 up to 1907, the increase amounting to 34%; and between fifty and sixty, 24%; and between sixty and seventy, 58%. So you see the mortality after forty years of age is increasing. There has been a decrease in the mortality under forty, while there has been a great increase in the mortality over forty; and this

increase in chronic diseases has pretty nearly balanced the decreased mortality from acute diseases; so our increase in average longevity is small. There has been a little increase in the last fifty years, not a very great increase, would have but there been a very, very great increase if it had not been for this enormous increase of mortality from chronic diseases.

In Massachusetts, you see, the increase from apoplexy was 135%. For the United States, 84%. Diseases of the kidney 83% in the United States; increase in heart disease and apoplexy together in the United States as a whole, amounted to 135%.

Now, one reason for this increased mortality from chronic disease is unquestionably heredity. It has been found out in the last few years that Mendel's law of heredity is applicable to human beings and animals as well as to plants. Mendel was a monk who lived about 150 years ago, and he spent a great part of his life in studying heredity in plants. He studied bees a great deal, and he worked out this law of heredity which is illustrated by this diagram. We will say a black eyed man and a blue eyed woman are married, and their children will have brown eyes. All the children will have brown eyes. Now, if each one of these children marries a brown eyed partner, and each pair had four children, according to this law of heredity, on the average it would be true, that in a thousand people there would be one black eyed child, two brown eyed children, and one blue eyed child in each four. Now, suppose that this blue eyed mother is hysterical. Suppose she is hysterical. Suppose she had a tendency towards insanity. Then you see what would happen. Three quarters of all the progeny in the third generation would have more or less of that tendency. A quarter of them all would be likely to be insane, according to that law.

Now, look at it as actually worked out in a family. In a neurotic family

family cousins married. Now, one of these cousins had a brother who was insane. The cousin was not insane; seemed as well as anybody, but had a brother who was insane, and she had some of that same insane tendency in her. These cousins married. See the results,--a nervous person, a paralytic, suicide, suicide, insane, demented, secluded, peculiar and erratic. Now, this person married this paralytic here, a nervous person married a paralytic. Now see the effect. A demented person, dementia praecox, dementia praecox again--a very hopeless form of disease, a maniac, a weak minded person. Two others that died in infancy. Now, see what a terrible record that is. Heredity kxx x is a divine bookkeeper that never makes a mistake, never loses track of a single figure.

Now, you see, it is applied to other things besides nervous troubles. For instance, here is a rheumatic man married a woman whose family were subject to pneumonia, and see what the effect is here. Here is one case of uremic poisoning in this group. Here is one case of ehrumatism. This man married a wife subject to rheumatism, came of a uremic family, with tuberculosis, and two of them were diseased in the same way, and the progeny were three, and they all had rheumatism and this one died of uremic poisoning.

Here is another defective family, mentally defective. A man married a woman in this case, a man had two wives. Here are the children of the first wife, and here are the children of the second wife. A man of defective character--and you see the number of defective children of that progeny. More than half the children were defectives. Here is another imbecile family. An imbecile man married an imbecile woman. He married an insane woman, and a second imbecile wife. The first wife was insane and the next one imbecile. That is the kind of effect you would expect in such a case. You see the consequence--one insane,--all imbeciles.

Now, such things are going on. The state of Indiana has got tired of that sort of thing, and so they passed a law which makes it impossible for

such people to marry, and for such things to happen; and they also have a law which makes it impossible for criminals to propagate the species by operations performed upon them. They are sterilized.

Now, we are going to change the subject. I am introducing to you here Prof. Pawlow's dog. He is not a handsome creature you see; but this is only a diagram of the dog. The real dog is really a very handsome fellow. In fact, he has a lot of them. I took pictures of them when I visited his laboratory three years ago. This is a diagram to show you how Prof. Pawlow learned some of the things I am telling you about here, and things which enable us to make the scientific dietary which we feed you here. This represents the tubei in the dog that carries food from the mouth to the stomach. This stomach has an opening which communicates with the outside of the body. This shows the opening to the inside. This opening here goes to the mouth, but in this case the tube has been opened up, an incision made in it, and it has been attached to the skin, and the other end communicates with the mouth. Here is the dog's breakfast.

The dog eats breakfast and it drops back into the pan again as fast as he eats it. The dog has an awfully good time. He seems to enjoy it immensely. I saw a dozen of these dogs eating breakfast at ten o'clock in the morning, and they had been eating ever since six o'clock in the morning, eating all the time and getting a better appetite all the time. Wouldn't there be some fun in eating for four hours and getting a better appetite all the time? These dogs have a great deal of fun in this way, because the appetite gets sharper every minute. Within four or five minutes the gastric juice begins to pour out of the stomach into the pan below, after the dog begins to chew. During the four hours the dog is working a whole quart of gastric juice passes out into that bottle, xxx although not one particle of food has entered the stomach. It is simply the infl

influence of the taste upon the nerve centers in the brain which control the stomach, the so-called psychic centers. Now, each dog has for its stunt to make a quart of gastric juice every morning before he goes to breakfast, and they work away at it, and every now and then have a little fresh food thrown in to the pan, and the dog keeps eating it over and over and over, and they eat so fast and vigorously that they get really tired, then they rest a few minutes, and then go right at it again; and when ten o'clock comes they all seem to know it; they all stop at once, and each dog is taken down and a tube is passed down here into his stomach, and his breakfast is poured in, a prepared breakfast made up almost entirely of oatmeal. Although he chews meat and has the pleasure and the enjoyment of his fine steaks, don't you see, he really lives on oatmeal gruel. That is what goes into his stomach. But he does not care what it is that goes into his stomach.

Now, Pawlow has discovered a lot of important things by these experiments upon tose dogs. He discovered among other things, for instance, that meat is a thing that makes very powerful, and very acid gastric juice, and that is why he gives these dogs meat,--because he is getting that gastric juice to sell, don't you see, and he ships it all over the world. We have got a supply of it down in our pharmacy. I will try to have some of it brought up here so I can show it to you. I get every little while an importation from Prof. Pawlow to keep us supplied, and once in a while we find a man that can not digest anything at all, and we give him a little natural gastric juice. We do not say where it came from. If he wants to know what that medicine is, I tell him to look on the bottle and see; and it is all in Russian so it does not do him any harm to read it.

Now, there is a lesson in that. If you have got too much gastric juice, you would not eat beefsteak, then, would you? because beefsteak is the very

very thing that would make the most acid gastric juice that it is possible to make; yet, you know most people in the United States today who have sour stomachs are eating beefsteaks to relieve sour stomach, and the doctors are prescribing it to them. It takes a long time for any one to start out in any profession,--in law, in theology, in medicine, or any other branch of human knowledge--it takes a long time to get a new idea spread out over the earth. Now, Prof. Pawlow made these discoveries ten years ago; and I attended as much as six or seven years ago a meeting of the gastro-enterological society at Washington, and I was asked to read a paper there at this meeting which was thoroughly discussed, and everybody there was informed of these discoveries by Prof. Pawlow, and I am certain that every specialist that went away from that meeting went home determined never to give his patient who had too much acid in his stomach any more beefsteak. It was the beefsteak that made the trouble in the first place. It is the beefsteak that caused the stomach to become so overexcited and over-irritated that it got the habit of making too much gastric juice; so the longer we continue to use beefsteak, the worse off we are. But you say, "When I eat beefsteak, my stomach feels better." Why? Because that beefsteak acts in your stomach just like so much soda. The acid in the stomach combines with the beefsteak just as it would make a chemical combination with soda. So beefsteak neutralizes the acid, you see, but at the same time it stimulates the stomach to make more acid and makes more acid, and makes the condition worse.

This fact is to me a very good argument that human beings are not intended to eat beefsteak, for the reason that the human stomach is not adapted to withstand the attacks of such a strong gastric juice. This powerful gastric juice is made to digest meat and to disinfect meat; it is dog's gastric juice, if you please; the human stomach is not adapted for it. When one uses meat for a long time and his stomach is making such powerful acid, the acid by and by

irritates the stomach and the stomach loses its power to resist the attack of the acid, and so there comes an ulcer. I heard an eminent Chicago physician say at a meeting of the American Medical Association a few years ago, in the surgical section, discussing what should be done for ulcer of the stomach. In the discussion, he said, "Gentlemen, I have listened to what the various speakers have said, and I am convinced that none of you gentlemen know anything about ulcer of the stomach. Ulcer of the stomach is the result of meat eating; it is meat eater's disease; and instead of operating upon a patient to cure ulcers, let us withdraw the beefsteak, and the ulcers will get well of themselves." That is not true of every ulcer, but the ordinary ulcer will generally be cured by withdrawing the beefsteak.

Here is some of the natural gastric juice with the Russian label on it, just as it comes from St. Petersburg. A tablespoonful of this gastric juice after meals is found to be extremely valuable ~~in~~ when persons have not sufficient gastric juice of their own; for the dog's gastric juice is far more powerful than that of the human stomach, and the reason is that the dog has by ages of natural selection become accustomed to a meat diet.

Now, I want to call attention to the difference in the teeth of these animals. There is the skull of a horse. You see here is a wide space in which there are no teeth. Here are the large, flat-topped teeth which are used for grinding. Here are some chisel shaped teeth used for cutting; here is a little tooth--the so-called bridle tooth of the horse. Here are the dog teeth. See the difference--sharp, saw shaped teeth. They are like the teeth of saws that fit in together. You have noticed the difference in the way the dog chews and the way in which a cow chews. You know how the cow grinds her jaws back and forth sideways, and she is grinding with the jaws; but the dog does not grind that way; he simply chops his food up; he can not grind; he can not move his

jaws sideways at all. He can only chop up and down and hetchel the food, make it small enough so he can swallow it down, and down it goes. He masticates it only just enough to swallow it, because the gastric juice can dissolve the meat completely. But the human stomach is not able to dispose of the meat in such a fashion, because the gastric juice it makes is not strong enough.

Notice these long teeth here, the so-called canine teeth which are embedded into the flesh and are useful in tearing. Look at the teeth of the gorilla. Here are eight teeth on each side, and that makes thirty-two teeth in all. Look at the human teeth here. Count them up and you see there is the same number of teeth, and the same kind of teeth,--four incisors in front, three big molars, and the small molars, so-called cuspid teeth, or eye teeth. The only difference is that in the gorilla the eye teeth are longer than the other teeth, and they lap by a little bit. There is a little space for each one left there. In the human jaw the teeth are all the same length; there is no space left for the cuspid teeth to pass by in; they are all of the same length.

When you come to consider the diet of these animals, it is exactly adapted to their teeth. Grass and coarse herbage are nipped off by the front teeth, then ground up by the back teeth. The dog simply chops up his food into bits small enough to swallow; The gorilla cracks nuts, tears open the husk of the cocoanut and picks out the meats and eats them. That is why he needs those sharp teeth. Human beings live upon a more refined dietary of fruits and nuts and do not require anything for tearing purposes but only for cutting and grinding the flesh of fruits and nuts which are prepared by the hand.

Now there is another thing about human beings, why they are adapted to the non-flesh dietary, and that is the liver. The dog has a liver of four times as great capacity as the human liver in proportion to the size of the dog, and that is because when the dog eats meat he takes a large quantity of poisons with it

with it. He has a short alimentary canal so the food does not have time to rot and decay. We have a dog over at the laboratory that we are feeding on different kinds of food, and when he lives on a strictly meat diet, the excretions contain no indican at all. The indican is the evidence of putrefaction in the intestine, but the dog dhows no indican, which sbws that there isn't any putrefaction in this case; but if there is any at all, there is very little, and there is not enough indican absorbed so that the most refined tests will show it. But when a human being eats meat, there is always indican present, and the reason is the liver is not able to exclude or destroy it.

Here is a diagram of the circulation that will explain some things so you will see why meat eating makes high blood-pressure. Here is the heart from which the pure blood comes out, and the blood is pumped by the heart into the arteries. A certain amount of pressure is maintained in the arteries. Conceive of the arteries, if you please, as a closed tank into which the bloo d is pumped. Now, suppose this tank has small openings and the water will come out of those openings. If the pump works hard enough the tank will be kept pretty full, and little streams with a good deal of force will shoot through these openings. If we have some means of regulating the size of these openings, we can make the streams small as we like. If we make the streams small and close part of the openings, the pressure will be higher, and the liquid will accumulate. That is what we have in the arterial system. The arteries have a capacity capable of holding ten or twelve pints. The ends of these vessels are madde up of very little tubes, and there are muscles in the walls which contract and dilate. When the face is flushed, it is because these vessels have dilated, and more blood enters; and when the face is pale, it is because the vessels have contracted and less blood comes in, and when the vessels contract the blood-pressure rises; and when these openings enlarge, the blood-pressure falls because

there is no opportunity for the pressure to rise. Here is the large venous system. This represents the muscles which are capable of holding all the blood in the body, and the skin is capable of holding two thirds of all the bloo din the body; and the abdominal vessels are so large they are capble of holding all the blood in the body.

The blood that enters this venous system runs back from the veins to the heart without any pressure, simply runs back as waterx runs in an irrigating ditch, without pressure. The pressure is in the arteries. That is the reason why when you xxx cut an artery the blood spurts with each beat of the heart; whereas when you cut a vein, the blood simply flows with a steady, feeble flow. Now, the bloodx that goes into the portal circulation, the vessels of the abdomen here, has to go through small tubes here; after it pases through the liver, most of it, before it goes into the heart. So when we eat meat and it decays in the intestines, the poisons that are absorbed are all passed through the liver, and when we drink tea and coffee, the poison of the tea and the coffee, the uric acid--remember, a cup of coffee contains more uric acid than the same quantity of kidney secretion contains. There is more poison in a cup of tea than there is in the same quantity of urine. There is twice as much in a cup of coffee--three times as much as there is in the same quantity of urine. So coffee is not a good thing to swallow, especially if you have a tendency to rheumatism or arteriosclerosis, or old age; and we are all tending that way. Alcohol and tobacco, mustard, pepper, peppersauce, xxx ginger,--all of those things,xxxx if one takes them, have to be passed through the liver before they get into the general circulation. And here is a provision of nature to protect us against ourselves, so that when we swallow these poisons they may bexxxxxxxxxxx filtered out and we may be saved, temporarily at least, from their bad effects. That is

the reason why the gin drinker gets gin liver. All the alcohol he drinks is filtered through his liver, and the liver gets the worst of it. That is the reason a man who eats pepper gets gin liver quicker than the gin drinker does. Pepper has six times the power to make gin liver that gin has. Prof. Voix, of Paris, showed that by experiments on rabbits and guinea-pigs. And all these condiments produce the same effect, and the reason why is they cause degeneration of the arteries of the liver, cause the liver to become hardened, but what happens to the liver happens in all the rest of the body, as Prof. Huchard, of Paris, has shown, and other investigators within a few years back,--that all the condiments--mustard, pepper, peppersauce, and all these various condiments--ginger, cinnamon, etc., when freely used, that they cause hardening of the arteries in the whole body. They took these condiments, made extracts from them, injected them into rabbits, and these rabbits got old, and their arteries got hardened within a very few months' time; so it is no wonder that human beings who indulge freely in these things,--Heinze's 57 varieties, for instance,--eat them, and I will guarantee you can get old as rapidly as you possibly want to if you eat all of Heinze's 57 varieties. Now, that is one thing he does not put into his advertisements; but I am going to make some new advertisements for him to let the public know something about it. People are eating these things all the while. People imagine because they are pure that they are good. Why, pure whiskey is the worst possible kind of whiskey. I never say anything about adulterating whiskey, because you can not do whiskey any harm by adulterating it. You can not adulterate tobacco either. I never say anything of adulterated pepper. It is adulterated sometimes by means of cocoanut shells, ground up, and the more they adulterate the pepper, the better it is, because there is less pepper, so it is not quite so harmful, in fact. Why, there is no adulteration of tea or coffee that is one tenth part as bad as the tea or

the coffee itself. Even the worst adulteration I ever heard of,--there was an investigation in London some time ago as to what came of dead horses. It was found that the hoofs were made into calves' foot jelly; the hides into leather, and other things, the bones into fertilizer, and the intestines into sausage, and the horse's flesh was made into canned beef, and the horses' livers were made into coffee,--roasted and made fine coffee. Now, these poisonous things that are circulated through the liver--the liver, as I said, gets the worst of it; so it is no wonder we find a great many people going about and saying, "Oh, my liver," and it isn't any wonder we have so many kinds of cholagogue pills and livers pills, Carter's little liver pills, and I don't know how many years I have seen those advertisements, and I suppose many of you have patronized that miserable thing and swallowed millions of them perhaps, but all those complaints about the liver are because of the abuse to which the liver is subjected, because the liver is so badly treated; it is torn, scratched, and blistered until it becomes very much like I heard a preacher once describing a certain man's conscience. He said it was like a burned boot; and this poor liver tissue gets to be very much the same. When a man dies with that kind of liver and you try to cut it with a knife, it is like cutting a piece of hard cartilage or leather. It is almost impossible to cut it sometimes. This is the result of continual exposure to the action of poisons,--just a little today and a little more tomorrow. It is like the drop that wears away the hardest rock after while,--this continual exposure of the liver to blood containing poisonous matters.

So the liver is a very important, great filtering arrangement, and when a man has a lazy or inactive liver, it is simply an overworked, congested liver, and the thing to do is to give the liver a rest. Turn it out to pasture, if you please. That is coming to the Battle Creek Sanitarium. Change the diet and give the liver a chance.

Now, about blodd pressure, you can readily see these little arteries which are the only means of escape for the blood from the big arteries,--if the walls get thickened and hardened so they get shriveled up and obliterated so there are only half as many openings as there ought to be, the result will be the pressure will rise, and it will take more pressure to get the blood through. That is the important thing--to get the blood through--the proper quantity of blood. When a man gets up on his feet and feels a little giddy, the reason is generally not too much blood in his head, but too little. The heart was not able to get the blood through, so the heart has to work harder; it has to pump harder to get the proper quantity of blood through the smaller openings, and that causes the blood-pressure to rise. So the blood pressure itself is not harmful. The rise in pressure is necessary. If you have got a blood pressure of 200, you ought to be thankful that you have got a heart able to do it, because if that blood pressure of yours should suddenly drop to 150, you would die; you could not live with a blood pressure of 150. That is the reason why your heart is working, keeping the blood up to 200 because it is necessary for it to do it, and you should be thankful enough to have that blood pressure of 200; but it is undesirable to have that kind of blood pressure all the time continuously, because that poor heart is doing double duty. One hundred would be about the normal pressure; but it is working against double pressure, and that means probably three or four times the work it ought to do; and it will soon get worn out and collapse; and when the blood pressure drops, comes down to 150 because your heart is not strong enough to keep it up to 200, then you begin to get dropsy; your feet begin to swell, you begin to get giddy, to lose your memory, and you wonder why you can not think, and you are confused in your thought, and you lose your appetite; the stomach will fail to make gastric juice; the kidneys will fail to eliminate poisons; the liver will fail to do its work. Every organ in the

body will fail of its function because the blood supply is insufficient; so it is desirable to keep the blood-pressure up. It is a very common thing for people to come here with blood pressure of 180, and when they have been here a couple weeks to find the blood-pressure 200. When I find such a case, I congratulate the person, because that shows that the heart has improved to the point where it has become strong enough to furnish to the body all the blood needed even under these adverse conditions; so we know such a man has a power to go on and recuperate.

Now, in a few weeks more you will find it will begin to creep down again, and that is due to the real gain. That man is on the upgrade, and the pressure goes down a little, and more and more and more. By and by perhaps it gets down to 130 or 140, and he can live on for fifteen or twenty years if he takes good care of himself; but he has got to keep working at that blood pressure all the time to keep it down. High blood pressure is like a house afire, when the fire is first started, it is going to keep on burning the house. If you can not put it out entirely but can quench it, get it down so there are only a few smoking cinders somewhere, that is the next best thing. That is the best thing you can do with these chronic cases of high blood pressure,--to put out the flames, quench the fire, so it is only a few smoking embers, and keep it there for a while. But by and by it will break out again. How are you going to get that blood pressure down? Exercise is one way to do it; because that opens up the blood vessels of the muscles. The blood vessels of the muscles during exercise contain six times as much blood as under ordinary conditions--six times as much. That is a whole lot, isn't it? That is a great deal, and it is very important. So by gentle exercise, we draw the blood into the muscles, and you see that will lower the blood-pressure, lessen the work of the heart, you see, because it opens up these tubes that lead into the muscles, dilates them, and t

and that relieves the heart; then the skin, by massage, by warm baths, by friction of the skin, by sunbaths, the vessels of the skin are dilated and there is more blood retained in the skin, or circulating in the skin and so the heart is relieved. Sun baths are good. When you get sunburned, the skin is red, because the blood vessels are opened up. The skin is capable of holding two thirds of all the blood in the body; so there are a great number of these openings in the skin, and if we dilate the vessels of the skin, or open up the vessels, it affords a great relief to the heart. So the heart does not have to pump so hard to get the blood through the skin, you see. So by means of baths, cold baths which produce reaction afterwards,--they are of great value because they produce a healthy, ruddy skin, which means more blood in the skin. It is generally hard to produce this reaction in a man who has high blood pressure, because the vessels are so contracted you can not get up enough dilatation to produce reddening of the skin.

Here is another way. Here is this large portal circulation that is capable of holding all the blood in the body. Abdominal massage is a good thing. Deep breathing exercises especially are good, which move the blood more rapidly through the portal circulation; but the most important thing is correction of the diet, because the mustard, pepper, pepersauce, tea, coffee, and beefsteak and beeftea, and broths of all kinds,--mustard, pepper, peppersauce, ginger, beeftea, beefjuice and broths of all sorts, of all kinds, and meats and meat extracts,--they all contract the blood vessels and raise the blood pressure.

While I was talking with a gentleman who came up from Chicago and brought his wife a couple of days ago, I said, "How did you happen to come here, my friend?" "Why," he said, "Doctor, I have been drinking your Postum for four years. That is what brought me here." I said, "I am glad Postum does us a little good once in a while--if it brought you here we will thank Postum for so much."It does not do us any good when it knows it. Now, this gentleman

said,"I went to a friend of mine and he advised me to bring my wife here; but now I want to tell you, Doctor, about my wife's case. You know a couple of years ago my wife had a very bad condition of her limbs, varicose veins, and she went to a doctor and the doctor said, "Now, then, have an operation, but your must have your weight reduced a little first, and you must go over to the hospital and stay; and she was there several months, and he put her on a diet of beefsteak, tea and tomatoes to reduce her flesh She ate a pound of beefsteak every day for breakfast, and about all she ate was meat. After while eczema broke out on her limbs, and the doctor worked at that for nine months, and it wasn't any better. By and by a friend of mine who was a doctor,--he consulted him, went over to see her, and he said,to take her away. The doctor at the hospital telephoned to me after while and said he was discouraged, said he could not cure that eczema. So we took her over to a doctor who was a famous skin specialist, and the doctor said, 'Well, take her away.(He took away all the beefsteak, and in a few weeks she was entirely well. The eczema had entirely disappeared. The doctor said if she had keep on on that diet a couple of weeks more she would have been dead. " When we examined this lady she had a blood pressure of 200, and it was the beefsteak that did it. What the doctor did was not an unusual thing. It is the old fashioned diet for a person who is obese,--a meat diet,--that is the old fashioned way of doing it.

About forty years ago a certain doctor devised the method of curing obesity by putting people on a meat diet, and that idea had been followed slavishly because some English doctors set the fashion, and it has been going on. The only thing the obese patient needs to do to reduce his flesh is to eat less. He does not have to eat meat, he does not have to cut off butter, he does not have to cut off anything that is wholesome; he can eat any kird of wholesome food anybody can eat, but he must not eat so much. That is all that is necessary. An ounce of butter won't make a pound of fat; it will make only an ounce of fat.

of fat. If one has been eating enough food to make a pound of fat ever day, if he only eats half as much, he will only make half a pound, and a person burns up at the rate of a pound a day; and a person who has been eating at the rate of a pound and a half a day can only burn up a pound a day. Now, if one eats only enough to produce half a pound of flesh, he will lose half a pound, don't you see. That is the way we lose weight. I mention this as an illustration. We are seeing it all the while, and we can not follow slavishly. The doctor tells you to do something; ask him why he wants you to do it. If he gives you a good reason, do it; if he doesn't, don't do it. I don't ask any patient to accept any prescription I make for him if I can not show him a good reason why that will convince him that he ought to do it. There is reason in everything that is sensible and right for him to do; there is a reason for it. There was a time when it was the fashion for the doctor to say to the patient that it was none of his business what the prescription was for. But we have gotten beyond that. The world has lost faith in ~~it~~ doctors somewhat because we did not do our duty, and we have lost standing, lost caste, and I hope that in the course of fifty years the doctors will gain back the position that belongs to them and which we have not had but have lost. The Christian Scientists and the quacks have come in and taken the confidence of the public that belongs to the medical profession because we have not done what we ought to have done to educate the men and women, the public, how to livex so they will not be sick. Some thirty years ago a doctor said to me, "Now, Doctor, what you are doing is all right I know; your ideas are all right; your ideas of diet I approve of; but suppose when a patient comes to me I should tell him he must stop smoking, that he must not eat any ~~tea~~ meat, or drink any tea or coffee, what do you think he would do? He would go right straight across the road to my competitor and never have anything more to do with me; I would lose him." Unfortunately that was true to a large degree;

but men and women are becoming intelligent upon this question of health getting, health keeping; so it is safe now, at any rate, for the intelligent doctor to tell an intelligent man the real truth; and I am glad it is. I have several things more to say to you, but I must pass on.

I would like to say to you that a meat diet is insufficient to produce blood. This is a case of anemia. The case of the average person suffering from anemia who ~~xxxx~~ comes to the Sanitarium. Now, putting that patient on a low protein diet,--his blood will increase and improve by a diet in which there is no meat at all. So you see a low protein diet will make good red blood. Here is his blood pressure. This is normal pressure, and this is on a high protein diet, and the pressure is 160. Now, when the diet was changed to the low protein diet, we found the pressure dropped down twenty points within a couple of weeks. We have got a good many people here whose pressure dropped down to thirty or forty points below what it was when they came in the short time they have been here. If a person goes on eating beefsteak the pressure goes away up sometimes to 300. We had a person here with a pressure of 310 a short time ago.

This is the outline of Mr. Long who is the strong man of Harvard. He has lived for four years on a low protein diet. There is a description of him. He is Harvard's strong man. He is a football hero, and he has lived for four years on fourteen cents a day, and this tells how he did it. All through his college course he lived on a dollar a week, and he lived right at the same restaurant with the rest of the students, but he selected foods that cost little but nourished much, and the result has been he has been able to live on an average of a dollar a week, or $39 for a school year, and saved each year enough money to take a trip to Europe; so he has got a liberal education. He gives his bill of fare up here and shows just what it costs. This was copied from a photograph ~~from~~ of a page of the New York Journal in which an account of this young man was published. This tells its own story. Good night.

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QUESTION BOX LECTURE

At the Sanitarium Parlor, Battle Creek, Mich., Monday, September 12, 1910, at 8 p.m.

By

J. H. Kellogg, M. D.

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Question: Are lemons a good remedy for rheumatism?

Answer: Yes, a most excellent remedy. Sour fruits of all kinds are good, tomatoes included. Now, I suppose many of you will be very much shocked at that, because it is a popular idea that acids of all sorts are bad in rheumatism. It is one of the greatest errors that I know of in dietetics. There is nothing more healthful in rheumatism and in troubles of that sort than fruit acids of all sorts. The old idea xxxx was that rheumatism being due to uric acid it must be that acids of all sorts would be bad for rheumatism because they would increase the acidity. Now, there are two errors about that old theory of rheumatism. The first is that rheumatism is not due to uric acid; and the second is that fruit acids do not increase the acidity of the blood; so you see both of those suppositions are wrong. xxxxxxxxxx How did we get the idea that rheumatism is due to uric acid? Because the persons suffering from rheumatism, very often showed evidences of the accumulation of uric acid in the body. That is the reason. And it was found that when a person suffering from rheumatism ate a great deal of meat, it was likely to make the rheumatism; people who ate sweetbreads, would have a new attack of rheumatism, perhaps. Foods, in other words, that xxx contain uric acid, as all kinds of xxxxx animal flesh do contain,--every sort of flesh food contains uric acid,--such foods increase rheumatism. Now it seemed very reasonable, but a careful study of the subject has shown that there is really no definite relation between uric acid and rheumatism. Nobody was able ever to produce rheumatism by administering uric acid. It was a fact that was hard

was hard to get over--that experiment; it was impossible to produce rheumatism by feeding animals uric acid. Now, my belief in reference to rheumatism, and I think it is a growing belief among the members of the profession, is that rheumatism is due to poisonous substances that are generated by the decomposition of proteins, not necessarily meat, but proteins in the intestine. In other words, rheumatism is one of the consequences of intestinal autointoxication. Now, this doctrine of autointoxication is a new doctrine, new to so many people that whenever it is mentioned people think, "Oh, that doctor has got a fad; he is preaching autointoxication; that is a hobby he is riding." I met a doctor from Chicago today who was telling me what another Chicago doctor said. I will have to tell you the doctor's name, I suppose. It was Dr. Pettit, one of the doctors in the outdoor farm, the tent colony near Chicago where consumptives are treated, and he called on us today to investigate our methods of treatment and our diet particularly with reference to instituting the same system of diet that we have here for these tuberculous patients at the farm colony near Ottawa. I do not say the doctor is going to do it, but he is going to make some experiments, and if the facts in the matter are proved to be true, they will be very glad to do it. They are very strongly in favor of the idea. Now, the doctor said to me today, "Doctor Moyer says that all diseases are due to autointoxication,--to two poisons, one poison produced by germs, and the other produced in the intestine." And that means the same thing, or the germs produce the poison in the intestine. Now, of course, Dr. Moyer did not expect to be believed literally, to be taken absolutely literally, because there are some diseases which are not produced by autointoxication; but the progressive members of the medical profession, those who are studying and observing the results of laboratory research are coming to see very clearly that nearly all chronic diseases are due to poisons absorbed from the intestines and perverting the functions of the body. Now, this is a matter of very great consequence to the medical profession, because it relieves

the medical profession of an enormous burden of worry and annoyancex which they were formerly subjected to. For instance, in the old days when the patient said to the doctor, "Doctor, what makes me bilious?"--you have said that a thousand times--I mean this audience has said it to doctors a thousand times at least,--"Doctor, what makes a person bilious?" The doctor could not tell you. He would say, "Well, your liver gets torpid." "Well, what makes my liver torpid?" I think people had the idea that the liver had a sort of streak of total depravity in it, or went on a strike, or something else--got perverse, sulky, and would not work. And I have met people who were fairly furious about their bad livers. One lady said, "Oh, Doctor, if you would just take this old liver out, I would be all right." She fairly hated that liver. She really wanted to commit homicide in her mind; she wanted that liver murdered, she wanted to have it killed; she wanted to have it taken right out, and burned, or something else done to it. Now, such a state of mind is most unhappy. If you feel hateful towards your liver, you can not expect your liver is going to get up and roll up its sleeves and go to work and work for you when you are hating it all the time--you can not expect such a thing. That is the reason the old doctors talked about melancholy. You know what melancholy means? Melancholy and hypochondria--do you know what hypochondria means? Hypochondria means there is something the matter down here under your liver, under your ribs. We say, down in the mouth; but the old Greeks used to say, down under the ribs. That means something the matter with the liver down here under the ribs; that is the idea. Now, we know better than that. We know that when a person is bilious, it is not because there is anything the matter with his liver. The trouble is his body is full of poisons; he is absolutely intoxicated. I met a bilious lady a while ago in my office, and I examined her case, looked at her tongue, and I told her that I thought she was suffering from autointoxication. "You are

xxifxx entirely mistaken, sir; you are entirely mistaken; I have not had a drop since night before last. I admit I do take a cocktail just before I go to bed, but I didn't have any last night." Now, it is an intoxication that is worse than that. That was not the kind of xxxx intoxication I was talking about. A person can get drunk on w iskey and get over it in a few hours, but when you are drunk on poisons that are being distilled in your own body, when you have got a brewery and a distillery right down here in your own colon, and are generating poisons that are ten times as deadly, yes, 100 times as deadly as alcohol, and pouring them into your blood continuously, it isn't any wonder your brain is muddled, and you can not think clearly, that you feel dull and stupid and morose sometimes almost. I asked a gentleman who came into the office the other day how he was feeling, and he said, "I feel as though I wanted to bite somebody's head off." He had been accustomed to taking a cigar to control those feelings, but he had not had one that morning, and he had some beefsteak rotting down there in his colon, filling his body with poisons, setting all his nerves on edge, so he was all unstrung, and he wanted a cigar to antidote that, you see. Nicotin is a narcotic and it would hide those symptoms; then he could go on and eat some more beefsteak, and then smoke some more cigars, and by and by he got to where he had to smoke 25 or 30 cigars a day in order to keep those feelings in subjection. Now, with some people cigars don't answer. Then it must be opium. With ladies it is commonly tea and coffee, and sometimes cocain; but the ladies are going a little farther now; tea and coffee don't work any more, so they are coming to cigarettes. I met a lady in the lobby here not so very long ago, and she said to me, "Doctor, I am thoroughly converted to your principles; I am going to be a great missionary for this institution." I just caught a little odor of cigarette just then, noticed a little brown stain on the finger. I said, "You will have to change your perfumery if you do." She seemed very much

shocked for a moment, but she understood. She didn't make any remonstrance. She saw I had discovered the fact that she was a cigarette smoker. Now, I am amazed at the number of people I am running across all the while, the number of ladies that are smoking cigarettes. It is because they feel the need of something to quiet these nerves, to quiet this terrible clamor. Now, the trouble is not with the nerves; it is something back of them. Now, you had neurasthenia. You went to the doctor, and said, "Doctor, what is the cause of nervousness? What makes me nervous?" Did the doctor ever tell you what made you nervous? He didn't know what made you nervous; he could not tell you anything about it, until we found out this great truth about the manufacture of a multitude of different kinds of poisons down here in the inteestines that are thrown out into the body and produce such a great variety of symptoms. Perhaps you asked the doctor sometime ago, "Doctor, am I going to have apoplexy?" "Well," the doctor said, "what did your father die of?" "Well, he died of old age when he was ninety." "What did your mother die of?" "Well, she is not dead yet, and she is 75 years old." "Well, I don't know. What makes you think you are going to die of apoplexy?" "Well, I am a little stout, and don't you think I look as though I was rather apoplectic?" "Well, now, you may be." "What causes apoplexy anyhow?" "I don't know." He positively did not know. We knew it came from the bursting of a blood-vessel. He might have made up some kind of story about it, but doctors did not know. "Doctor, I have got an awful neuralgia. What makes neuralgia?" The only answer I could make to that for twenty years was a remark made by Dr. Chapman, of London, some years ago,--"Neuralgia is the cry of a hungry nerve for better blood." That is as far as anybody could get. The professor of practice in the medical college I attended when a young man gave a definition of neuralgia. He said, "Gentlemen, when you have got a pain, and it is due to a tumor, or a paralysis of a nerve, you know what causes that pain. When you have

have got a pain due to inflammation, why, that is neuritis. That is a pressure pain. When you have got pain due to an abscess, there is another form of pressure pain; but when you have got pain and you can not find out what it is, and you do not know what causes it, that is neuralgia." So you see neuralgia was simply a limbo into which the doctor threw all the pains he could not account for in any other way. And the limbo has been one by one ended. One by one the pains have been withdrawn from that limbo until at the present time there is not a single pain in limbo. There is not a single pain tat can not be accounted for by some other way than simply saying that we don't know what is the cause of the pain, so we call it neuralgia. We don't hear much about neuralgia any more. It has come to be a very uncommon word in our records on the pains of people that they suffer from--it is a very uncommon word. When we know that a pain that we used to call neuralgia is due to poisoning of the nerves, it is due to a poison condition of the nerves that comes as a result of certain poisons which are generated in the intestine and absorbed, and that is the cause of the mischief. Now, it is a good thing to know, then, that neurasthenia has an explantation that is better than we could give before. We know the cause of it, and so neurasthenia is nothing but a symptom, nothing but a symptom; we do not call it a disease any more. The real thing back of it all is this great reservoir of poisons pouring into the blood continually and manifesting itself in a great variety of ways. Now, we must hurry on, for we have got a lot of interesting questions here.

Q. What are the conditions that cause hiccough?

A. An irritable condition of the nerves of the stomach. Generally there is a quantity of liquid in the stomach, and the best remedy for hiccough is to pass a stomach tube down into the stomach and empty it out. That nearly always relieves this condition. Sometimes I have found a person who has been

hiccoughing for two or three days, passed a stomach tube, and taken out a quart or two of the most offensive, irritating liquid, and the hiccough stopped instantly. I have been called to see some cases in which it looked as if the patient was going to die from hiccoughing, and the stomach tube gave immediate relief. Sometimes the symptom returns after a few hours, but a few applications will relieve it. When you get hiccough, this will generally stop it if it is a mild attack. Take out your watch and you note here comes the hiccough. Count off to see how many seconds--just ten seconds. Now, then, you know the periodicity of that hiccough, so you hiccough; now then wait five seconds, then take a very deep breath, deep as you possibly can, and hold it hard and watch until the time has gone by, until ten seconds has gone by, and fifteen seconds, and twenty seconds; hold it as long as you can, and very likely the first time you try it, just as you are letting go the breath, the hiccough will come on. But that is not sufficient; try it again. Drink a little real hot water; then try it again, and the probability is that in two or three efforts you will succeed in stopping it by simply breaking up the periodicity of it. That is the reason why hiccough can be stopped by scaring the person. If you ever scare such a person at just the right moment, just the moment when the hiccough is going to come, instead of the hiccough coming, the person will take a very deep breath, you see, and that will break up the periodicity and the hicccough will be for the time being cured. The application of electricity over the stomach and under the ribs is a very good means of stopping it.

Q. What causes itching of the lower limbs in winter time?

A. It is due to a congested condition of the skin. Generally the skin is too dry. That is the usual cause of it, and sometimes it is the use of soap and hard water leaving a little irritating coat behind on the skin. It is generally due to excessive dryness of the air. Some people who have very

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nsitive skins in winter time do not sweat very much, so there is not enough sweat and not enough fat made to lubricate the skin, and when a person takes a bath and removes the oil from the skin, the skin is left without proper protection, and the contact of the very dry air with the skin causes very fine cracks in the skin, too fine to see with the naked eye, and that sets up a little irritation. Now the remedy for such a condition, is every time you take a bath, you should take care to cover the skin very thoroughly with some fine oil like white vase - line. White vaseline is perhaps the best of anything for the purpose, because it is an antiseptic remedy and it is very good.

Q. What would you advise for a person suffering from general weakness but with no disease?

A. Now, I advise that person to cultivate health. I just advise them to cultivate health. That is all such a person needs to do. He should eat calories enough for a person of his height. If he sees the table says he should eat 2000 calories, then he should take care to eat 2000 calories every day. If he is a little under weight, he should eat a little more than 2000,--2100 or 2200 calories. He should take a moderate amount of exercise. He should go out doors, live outdoors, and sleep outdoors. I don't know anything that xxxxx has so much boosting power as sleeping outdoors in cold weather at all seasons of the year. Sleep right outdoors, not necessarily under the open sky, but on a porch or in a room with the windows wide open and the air moving vigorously through. On the coldest winter night I have slept under those conditions myself for a good many years. If you will take a little walk out to my house on Manchester street here, you will see in the rear part a two-story sleeping balcony. My women folks all sleep in those balconies. We have quite a lot of folks up at our house- not so many now as we used to have, and those are our sleeping balconies. In my part of the house I have to stay by the telephones all night--three telephones right

right at my ear and I have to be in connection with the surgical ward and everything else going on around here, so I have to stay by the telephone; but I have the windows all around my bed wide open, and I often wake up in the morning in the winter and find two inches of snow on my bed; and I frequently have to wake up in the night and break the icicles off my beard in winter time. We have plenty of cold air. Now, we don't suffer any because xf these outdoor beds have a little mattrass made just like these rugs with which you take the blanket packs, or thermophore packs, made on the same principle as the thermophore,--just a little electric pad;xxxxxxxxxxx we have a blanket like that put in the bed just over the mattrass, and by touching a button, the bed is made nice and warm and dry before you go to bed. When our folks go to bed they are dressed up xx as if they are going to take a sleighride. They are thoroughly bundled up from head to foot, and have great, big thick hoods on their heads, long enough to pull down over the nose. No matter how cold the wind blows, they are warm as toast. When they go to bed, they simply touch a button and turn the heat off. If they wake up in the middle of the night and find the wind has changed and it is colder than they want to be, it is only necessary to put a hand up under the pillow, touch a button, and one is warm as toast again in a jiffy. So it is not necessary to use a very large amount of bedding. It is not necessary to be burdened with an excessive amount of clothes. I find outdoor sleeping has this objectionable feature--unless we combine with it this heating plan. The evaporation of moisture from the body and the condensation of this moisture in the bed clothing, and the bed clothing being very cold, it conderses the moisture of the body so that by and by the bedy gets to be very cold and full of dampness, and it is not dried out during the day, and unless the whole bed is exposed to warm, dry air during the day time, and dried out, there is this very great inconvenience; but by using this bed warmer with which every bed in our sleeping

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department is furnished, we overcome this difficulty. Now, there is a little expense about that, but not very large, and I tell you, my friends, there isn't anything in which it pays so well to make a good investment as in health. Now, just think of it. Some of you coming here and spending a thousand dollars or two thousand dollars or even more in a long journey and an expensive stay you are making here,--just think of what you might have been if you had made the investment perhaps of twenty-five dollars or fifty dollars away back a few years ago and gotten yourself started in the right road, in the road that led somewhere else. Now, of course, this is our good luck, that you did not, because we would not have had the pleasure of meeting you and getting acquainted with you. I should not have had this fine audience before me if you had all been doing the right thing; but for my part, I am very glad to see you. I am glad you are here; but I am sorry you had to come and I hope you will come again some time to let us see how well you are; and I am only saying these things so that when you get through I would like to have you graduate with honors so that you won't have to come back. This matter of getting well is just a matter of cultivation, a matter of training; it is a matter of training. A patient said to me today who had some difficulty, "Doctor, how long will it take me to get well?" "Well, I think by the first of April you will be in pretty good condition." "Oh, so long as that?" She said,--"The first of April, how can I ever stay so long as that?" Of course, I knew she would not, but I wanted her to prepare her mind for something reasonable. She ought to stay that length of time. It would not be one minute more than she ought to and could invest with the greatest profit. "Well," I said, "well perhaps the first of the year, if you are real good and obey orders strictly, we can let you off the first of January." She said, "Why, that is an awfully long time." Well, we don't work miracles. We can't work miracles. I wish we could, but we can't; we are farmers here; we

are simply farmers. All we can do is to sow the seed and cultivate the crop, and you have got to wait for the crop to grow. This is a natural process of cure; it is not a magic cure. We don't cure folks by simply making magic touches and ~~making~~ the laying on of hands. It is simply pointing out the road, ~~as~~ the right way for you to go. If you sow a certain kind of seed you can raise a certain crop. But it takes as long to raise a crop of health as it does a crop of corn, as long as it takes to raise a crop of wheat. Sometimes it takes as long as it does to raise a crop of winter wheat. I understand that they have got a kind of wheat in Northern Canada that can be raised in three months--in 90 days. We see our crops growing up, maturing, coming to harvest a great deal more rapidly than we used to. I am sure today we are able to accomplish in five or six weeks for a patient more than we could accomplish in as many months five or six years ago; and the mystery is in the fact that we have found out this matter of autointoxication; we have got that question solved; we have found out the causes of these troubles, and we know just how to go after them. I was saying to a doctor today about a case he wanted to send us,--we know what the causes of that man's trouble are, and that is half the battle--to know the cause; then we know how to remove that cause, exactly what to do to remove the cause; we know it can be done; and that is the rest of the battle. So the victory is practically won. Now, I don't suppose there is a patient here who can not be made immensely better by health cultivation, by cultivating health, eating right, and adopting the outdoor life. I am sure the average man does not appreciate at all the great value of this outdoor life. I was telling the doctor here today from the colony down there in Illinois, near Chicago,--they have proven that persons suffering from consumption can go there to that farm colony and get well just as well as if they go to Colorado. They get well right in the vicinity of Chicago just as well as to take a journey a thousand miles away from home. It is

the outdoor life. Now, here is a man. One of his lungs is already invaded with ~~xkix~~ these awful germs. Half of that one lung is gone with the disease, yet, if that man goes out to a farm colony, he does not do a thing but sit down there under the open sky and oreathe fresh air. He eats perhaps not just what he ought to eat. He eats too much and he eats things he ought not to eat, yet he does well in spite of it; because the benefits he gets from the outdoor air and in the night time when the windows are all open, ad the patients are sleeping there in the cold air, are so great. It is one of the first institutions of the kind in the country, and they have a large number of patients, 300 or 400 patients there,--at Rutland, Mass., where they have a state tubercular hospital. I made a visit to this institution a few years ago, and the superintendent showed me around, and we went into the ladies' dormitory, and there was a lady with a cloak on and a shawl or hood on, and mittens on her hands, and she was writing a letter, and I thought she was getting on rather queerly in writing that letter. It seemed rather cold. The windows were all wide open. I said to the doctor, "At what temperature do you keep the house?" "Oh, same as the outdoor temperature." "Well, don't you have any heat on at all?" "Yes, half an hour in the morning to dress by, and half an hour at night to go to bed by." "Well, but suppose the temperature gets down below zero, what do you do then?" "Oh," he said, "then we have to go outdoors to get warm." Now there is the fact. Think how economically an institution could be carried on on that plan,--not taking any baths, or doing anything for those patients, but just feeding them; and yet 60% of those patients getting well. Now if they had all the advantages you have added to this life outdoors, half the remaining forty per cent would get well. I haven't a bit of doubt of it. Perhaps three fourths of that 40% that go home would get well. Doctors are beginning to see that and to look into the thing. I have had letters in the last few weeks from superintendents of hospitals all over the

country making inquiries about our ways of feeding people, expressing their interest in it; and I see that the medical profession everywhere are waking up to the importance of dietetics, of nutrition; and if so much can be done by the outdoor life, you see that is a thing we can not afford to ignore. It is a thing we can not afford to dispense with; so I hope when you go to bed at night you are going to remember to open up your windows wide open. If you haven't bed covers enough, call for more, and you will be simply surprised tomorrow. Don't allow yourself to be cooped up indoors, inside, in the house; but go right outdoors. Don't be afraid of cold air; it doesn't do anybody any harm. The old idea was that cold air produced consumption. It does not at all. I met a gentleman a day or two ago who had just been down to New York, had been visiting the zoological garden there the superintendent of which is Prof. W. T. Hornaday, an old friend of mine, and Prof. Hornaday has turned his monkeys all outdoors, and they are thriving outdoors; and Hagenbeck, the great animal tamer, has written a book entitled, "Man and beast," and it is a very interesting book to read. He tells how he catches animals in the forests in Africa and central Asia, and all about it; tells how he tames animals and trains them and takes care of them; and it is a most exceedingly interesting story; and he tells about how the ostriches he caught, he thought he had got to keep them in a warm, tropical place, but he tried the experiment of having one side of their house open, and he said he was astonished to see those ostriches marching right out into the yard after a heavy snow storm and capering around, playing with the snow, and enjoying it immensely. But he has found that by giving the animals an opportunity to become hardened they are fortified and enjoy the winter, and improve in health. Down in Chicago you can see the monkeys at the zoological garden in Chicago, you can see the monkeys there in the coldest winter weather, shivering in the cold, knocking the snow off their shoulders, and yet they are thriving. They don't have tuberculosis any more, but they are cured of tuberculosis. Tuberculosis had been going on at

a great rate, but at the present time the monkeys thrive on the outdoor life just as people do. Dr. Trudeau injected six rabbits with tubercular germs so that they were all inoculated. Three of the rabbits he put outdoors. Three he kept in the house. The rabbits in the house all died, and the rabbits outdoors all lived. Down in Massachusetts, when they found a cow had tuberculosis, they used to kill the cow and remove the tubercular lungs, and send the rest of the body up to the markets to be sold with the rest of the meat, and the people of Boston buried dead cows in their stomachs. The people of Boston found that out a few years ago and showed that up and made quite a stir about it last year, I think it was; and it was found out when this thing was exposed, that that thing was being done all over the United States. The canned meat that you eat is largely made up of just that kind of material, of the flesh of animals that had tuberculosis of the lungs, or cancerous lungs, or pleural pneumonia, or actinomycosis--lumpy jaw-- or something else,--they cut off the diseased part and sent it back to the rendering establishment to be made into oleomargarine butter, but the rest of the carcass is sent over to be converted into canners. The people are finding out about that, and they are making a fuss about it; and the Massachusetts State Board of Health had to adopt new tactics; so now, instead of killing those cows that get tuberculosis, they turn them outdoors and they are actually getting well. They have special pastures for these tubercular cattle, and they find if they keep them outdoors and give them some of the outdoor life that belongs to them, that is natural for them, that they get well. Now, we supposed twenty years ago that goats did not have tuberculosis, so it was proposed to give goats' milk to people who had tuberculosis, to cure them, because if the goat did not have tuberculosis, goats' milk would be likely to render people immune against tuberculosis. But it didn't prove to be so. It has been shown by further investigation that goats do have tuberculosis. Goats ordinarily

do not have tuberculosis because they live outdoors, but you take the goat and shut him up xyxxx indoors and treat him as the ordinary domestic cow is treated, and the got gets tuberculosis just as quickly as the cow. It was supposed that animals that eat mead did not have tuberculosis. In the zoological garden of London it was found that carnivorous animals shut up indoors have tuberculosis and die of this disease, xxxxxxx the same as other animals that are shut up.

Q. Is Florida a good climate for weak,nerveus folks?

A. Yes, Florida is a beautiful climate; I don't know any climate that is not a good climate. The climate is all right. There are some climates where mosquitoes live, and they are not healthy. But you can put up a bar to keep the mosquitoes away, and you can live there in that climate all right. It is the mosquitoes and parasites and the poisons that make the tropical climate dangerous. It is not the air; it is the parasites, and if you keep away from the parasites, you need not have any trouble in any climate. It is the xxxx diet the people eat who live in tropical climates that makes the trouble far more than the climate. When one lives in a warm climate, he must take care to eat no meat, to live on a light, frugal diet, to avoid the use of meats entirely in a tropical climate, and he can almost defy any sort of disease, in a tropical climate, if he treats himself correctly. Man is about the toughest animal that lives on the face of the earth. If he was not, he would have been killed by his bad habits a long time ago.

Q. I see a sign, "Fletcherize" in the dining room. What does this mean?

A. Fletcherize means chew your food, and to chew it until it is thoroughly broken up, reduced to a pulp, a smooth paste in your mouth. Suppose you are chewing lettuce,--of course, you can not do that with lettuce. The lettuce is taken for roughage. You know, the farmer feeds his horses and cattle corn and oats, and then he feeds them something besides. If he fed them only

corn and oats they would die. Something like 120 years ago now a ship left Portland, Maine, for a port in the West Indies, with a carload of horses and mules, and they got about half way out and their cargo of hay that they carried along to feed the horses and mules was swept overboard by a great storm, and they had nothing left but grain, and pretty soon the horses began to die. They were throwing horses overboard every day, and the captain was very much disturbed. He undertook to investigate the matter to see what could be done, and he noticed the mules were not dying. They were getting along all right, and he found out the mules had taken to eating the ship. They were gnawing the sides of the ship, eating boards at a great rate; so the captain set the carpenters of the ship at work to making shavings for the horses. Some of the horses were dainty and would not eat the shavings, and those found a watery grave; but the horses that ate the shavings ~~xxxxx~~ of wood like the mules got through in fine condition. Now, the human body needs roughage just as these other animals do, because the alimentary canal is long, and it needs bulk; it needs something to stimulate it to activity. Food is the normal laxative; it is the proper stimulus of the intestine, and without a certain amount of bulk, the intestine is not likely to act; the food is absorbed so completely that the intestine is not properly stimulated, so the excretory substances, the bile, concentrated bile and other poisonous substances are left to accumulate in the intestine; so we need a certain amount of roughage. So, as I said, there is no use of chewing lettuce a long time. Get what flavor there is in it, and chew it fine enough to swallow, then swallow it and let it go on and ~~it~~ take care of itself. So with other things. One does not need to return to the plate all of the material that can not be reduced to a smooth paste or liquid state in the mouth. If he does, there is nothing left for the bowel to act upon. The food will be all digested and absorbed, and the result will be great inactivity of the bowels. But the food should be masticated thoroughly until the flavor is extracted from it; that

is, until you feel that you have tasted it thoroughly, and it begins to diminish in flavor, and it does not seem so pleasant in your mouth as it did at the start; then it will be gradually , automatically sucked down over the middle of the tongue and down the throat. Hold it up to the roof of the mouth and examine it with the tongue. By pressing the tongue against the roof of the mouth, you can see whether it is properly masticated or not, and the liquid particles slip out between the tongue and the roof of the mouth and go down, while the rough parts that need further chewing remain behind as a kind of strainer that you can operate by pressing the tongue against the roof of the mouth. That is a good way to chew some food--bananas, for example. Mash the banana with the tongue, and force it against the roof of the mouth, and the nice ripe banana will be crushed up in ~~x~~xto pulp very quickly in this way.

Q. Is there not danger of getting too much cold treatment in the bathroom here?

A. Ask your doctor about it. A person who is very excitable and nervous, and has a great many pains here and there all over his body might get too mught cold. But if you are getting too much cold you will know it. You will find, if you are getting too much cold, that your hands feel cold after the treatment, don't react well. Then you go to the doctor, and the doctor must give you shorter, and colder baths,--very short, fifteen seconds, perhaps, just very short, and perhaps you will have some kind of hot bath for preparation. Another symptom is headache. Another is increased pain. But the probability is you are not getting too much cold water. The great tendency is to get too much hot treatment.

Q. Is yogurt buttermilk a laxative food?

A. No, not to many persons. It is slightly laxative to some persons.

Q. Is horseback riding good for stomach trouble and neurasthenia?

A/ It is if you don't have anything painful in the stomach. If you have slow digestion, diminished motility, so the food stays in the stomach too long, horseback riding is a very excellent means of helping you get out. I met a gentlemen a little while ago who said food remained in his stomach five or six hours longer than it ought to. He could not take colax because he found it in his stomach sometimes six or seven hours after he ate it; and I showed him how to manage that; and I will show you, for it will be worth while. The stomach sometimes gets relaxed; its walls are so relaxed that they can not contract upon the foodstuffs and force them out as it ought to; so we have got to bring other assistants to bear to compress the stomach. Now, the stomach lies about here, and the abdominal muscular wall is in front of it here; and then there is the spinal column behind; and then there is another muscle, a large, strong muscle, the diaphragm, that is over the stomach. Now, if we get the stomach in a corner here and hold it right up hard, tight, in this way, then take a deep breath, we can compress the stomach between the abdominal wall and the spinal column here; and then if we take a deep breath, you see we have got that stomach surrounded. We have got the intestines below it pressing it up against the diaphragm and the backbone, and now we take a deep breath and force the diaphragm down on the stomach; but that is rather tiresome. So I showed the gentleman how to do it. Just lie down xxxh a on a hard surface on the floor, or a hard sofa, with a little hard pillow doubled up right against the stomach; lie down over it, so that this pillow pressas right up against the stomach; then take very deep breaths, and every time you take a deep breath, the stomach is being squeezed, and the foodstuffs that have been reduced to a liquid state are being forced out of it, and in five or six minutes the stomach will get a tremendously useful boost along the line of disposing of its digested foodstuffs.

Now, another way is to sit down in a chair and clasp the hands just over the stomach, just below the ribs, and press hard, back, and then bend over

just as far as possible into that position and then take very deep breaths. Every time you take a deep breath you give the stomach a good, hearty hug, don't you see, and it just forces the foodstuffs right out of it. Now, I suggested to this gentleman that every day two hours after eating, he should practice this for ~~five xxxxxxx~~ twenty minutes, then after that five minutes every hour until he felt relief; and in that five minutes he could take fifty or sixty of those deep breaths, and each one helps a little.

Q. Are the relapses of patients who have Graves's disease due to increased secretion of the glands?

A. Graves's diseases, or so-called exophthalmic goiter, enlargement of the thyroid gland accompanied by prominent eyes and a rapid pulse and other disturbing symptoms is really produced by autointoxication. This thyroid gland is an antitoxic gland, and when poisons are poured into the body in too great quantities, then the gland is stimulated to overgrowth and overwork, and that is the real cause of Graves's disease. So the first thing to do in Graves's disease is to cut out meats, correct the diet, take a thoroughly antitoxic diet, and that will remove the cause. Now, the next thing is, if possible, to diminish the size of the gland by the application of the X-ray, sometimes by surgery, but surgery, I am ~~xfrxix~~ very doubtful about the permanency of the results obtained from surgery because you have not removed the cause, you see. You have only removed the effect, and you have not removed the cause. So the same thing is true of the X-ray--it only in part destroys the gland. We must correct the diet as well. The diet must be permanently corrected. I happen to have in my pocket here just this moment a very interesting paper by Prof. Tissier. Tissier is the colleague of Metchnikoff. He is the man who discovered this idea of the curing of disease by means of friendly germs. Metchnikoff is not the originator of that idea. It originated with Prof. Tissier, his colleague in the Pasteur Institute. Prof. Metchnikoff has made it public, he has popularized the idea by

publishing popular writings about it; but Prof. Tissier is the man who originated the idea; and here is a paper by the originator of this theory, and he gives a description of how persons ought to live who have once suffered in this way. This is written in French, so I will not try to read it, but will give you a free translation of it. First of all he describes the case. Then he says physical exercise in the open air, and then a strictly vegetarian regimen--the suppression of milk and the suppression of eggs, and all species of flesh and of fish,--all species. They must be entirely suppressed. But, on the contrary, the patient may eat all kinds of fresh vegetables, prepared in almost every way, and he may eat these vegetables with syrup, with tomato sauce, or with almost any sort of sauce desirable; and salads and various sorts of fruits, either cooked or raw, and all kinds of cereal preparations, and particularly rice, macaroni and things of that sort. Now, he finds that is the proper diet for a person suffering from autointoxication, and this diet must be adopted and continued not only during the treatment, but for a very long time afterward. That is the difficulty. People get better for a while, then they go back, have a ralapse, if they do not continue to do the thing that made them better. When we find the way of health and it has lifted us out of the slough of disease, we must continue on that road or we will fall into another slough just as bad off, worse perhaps.

Q".Should one chew colax or swallow it without chewing to get the best results?

A. Just as you like. It is not necessary to masticate it; it doesn't do any harm, however.

Q. Are the ill effects of cane sugar reduced when cooked with fruits?

A. Not appreciably, no, because the sugar is not inverted to any great extent. There is a slight inversion of the sugar, but it is very slight.

Q. Are the Sanitarium foods manufactured here exclusively, or are

there branch establishments?

A. There are no branch establishments manufacturing the Sanitarium foods. There are some places where some imitations are made, but the real things are only made here.

Q. Can slow motility, poor metabolism, and a distended stomach be cured?

A. Yes, those are simply symptoms of disturbed nutrition and can all be cured by correcting the diet and by proper treatment--abdominal massage, hot applications and various other applications may be required. The treatment will be adapted to each individual case.

Q. Is it a good plan to have such a stomach washed out?

A. If the stomach is in a catarrhal state, retains food too long, it may be useful to wash it out; but it is not a good thing to wash the stomach out on general principles. There should be some reason for washing it out.

Q. Are white meats less injurious than red meats?

A. It was formerly supposed that they were, but Prof. Von Noorden, of Vienna, showed some four or five years ago that white meats are just as injurious as red meats; that there is no difference; they contain just as much uric acid; they undergo putrefaction just as quickly or more quickly, so there is no advantage whatever in white meats. Now, as I was saying a little while ago, it has been discovered that rheumatism is not due to uric acid, but rheumatism is due to poisons developed by the decomposition of meat in the body, and not by the uric acid in the meat.

Q. Is there any objection to canned salmon, mackerel, etc., as a food?

A. Very decided objection. They are a very, very poor kind of diet. If one found himself starving to death at the north pole and he should run across some canned salmon ~~xxxx~~ that had been buried, and he should get it out, I think in such circumstances I would eat ~~dog~~ it before I would eat dog, but

Diet

I would eat dog even before I would starve to death and deprive my friends of the pleasure of meeting me at home again; but I should certainly consider it a very poor diet, and only an emergency diet. There can be no doubt, I think, that the first use of flesh foods was simply as an emergency diet when there was nothing else to be eaten, nothing else to get hold of to live on, because it certainly is in every way a most unnatural and objectionable article of food.

Q. How soon after a heavy surgical operation ought a person to begin hard work?

A. That depends entirely upon what the operation is for, the conditions found, what is done, and so on. Generally such a patient ought to have two or three months to build up in at least.

Q. After the most moderate exercise I can feel the blood throbbing in my head. What is the cause?

A. You are probably not accustomed to exercise, and a little exercise excites the heart so that too much blood gets into the head; so you ought to increase your exercise very gradually until you can take as much exercise as you want without producing such effects.

Q. What causes vertigo?

A. It is generally due to too little blood in the head. The most common cause in persons in advanced life especially is a diseased condition of the blood-vessels of the brain; it is one symptom of arteriosclerosis, in other words; that is the cause of it,--not because there is too much blood in the head, but because it is an indication that the blood-vessels are becoming diseased. However, I should say that vertigo is most often due toindigestion, or to inactivity of the bowels and autointoxication; that is the real cause.

Q. Is glucose injurious?

A. I have never made any experiments with it that justify me in mak-

ing any positive statement about that; but we do not use it in the institution, and it is a chemically made sugar, and I have very serious doubts about its being equal to natural sugars as we find them produced naturally in the plants.

Q. Are maltose and glucose the same thing?

A. Not at all. Maltose is a natural product, the result of the action of diastase of malt upon the starch of corn, or of rice. That is the way Malt Honey or Meltose is made--our malt sugar here; but glucose is made by the action of sulphuric acid upon starch. It is a chemical product.

Q. What is the cause of a heavy feeling in the bottom of the stomach?

A. It is probably due to chronic catarrh of the stomach, and the stomach is brought into a condition in which its nerves are abnormally sensitive.

Q. Would you advise the no breakfast plan for one who is tired out in the morning and has a badly coated tongue?

A. Ix think it is well to take something in the morning, but take something light that does not require digestion unless you are engaged in hard physical labor. If you are engaged in hard physical labor, it is well to take some substantial food in the morning; but if you are engaged in literary work, it is well to remember that the literary worker, the professional man, the doctor, the lawyer, and the business man who does not use his muscles very much, does not require a bit more food than a loafer, not a bit more. The loafer who stands or sits around the barroom or loitering about the streets requires just as much food as the xkkxraxxxdx hardest working business man who sits in his office and only thinks, or works with his brain. This has been proven by men shut up in an iron box and all the forces generated in his body were measured, and one man was made to study as hard as he could study, and it was found he didn't throw off a bit more energy from his body when he was thinking as hard as he could think, studying physics in German,--pretty hard work for xxxxxxxxxxxxtn

an Englishman to do,--he didn't produce a bit more energy than when he was simply dozing,--doing nothing at all. This was shown xy xx in one of the experiments by the United States government in the laboratory at Middletown, Conn., so we must be careful not to eat too much. But take something light that does not amount to anything. For instance, take some fruit. My breakfast today, and my regular breakfast, is a couple of cakes of colax and a little fruit. Now, I take colax because I want some bulk of some kind, and I don't care to take food, because I xxxx find I have a clearer head for my forenoon work if I don't eat anything substantial in the morning that requires digestion, so I eat some fruit, possibly a little lettuce, and perhaps an ear of raw corn. I had some raw corn for dinner in the dining room that was really very nice. It is as much better than cooked corn as you can imagine. When you first taste it, you will have a little prejudice in your mind, and you will think it does not taste right, but go right on tasting it, and pretty soon you will discover it is the cleanest, sweetest, nicest morsel, about, you ever tasted, and you won't be at all sorry you made the experiment, I am sure. We had an eminent doctor dining with us the other day, and I introduced him to raw corn, and before the meal was over he said, "Doctor, I want to give you special thanks for introducing me to raw corn, for I didn't know it was such a nice thing." We need something raw, and we haven't very many raw things we can eat. Lettuce is about the only vegetable we can eat raw without inconvenience. It is not nice to sit down and eat a lot of raw oatmeal, or wheat, or raw cracked wheat, or raw rice, or peas or beans. They are not digestible if we do eat them; but raw corn is more digestible than cooked corn. The hulls remain on the cob, and the pulp, the center which is in the liquid state is ready for immediate digestion and assimilation and is disposed of much more readily by the digestive organs than after it has been cooked. After the corn gets ripe it is quite another question, because after the starch is nn ripened, it is no longer in the form of soluble carbohydrates.

Q. What is the subconscious mind?

A. I don't believe anybody knows. I have not found any authority yet that gave a very lucid description of it. We have ideas coming up into our brains continually from somewhere, and the place they come from people say is the subconscious mind; and if these thoughts come forward in organized form as they very often do, it is evident that there has been some prompting somewhere, generally before we were conscious of it; and that thinking that is done behind our consciousness is called the subconscious mind; but there is a very peculiar thing about it, and that is that it knows more than the conscious mind does; it is a great deal wiser than the conscious mind, and that is a very remarkable thing about it. I am inclined to think if we could get down to the very root of the matter we would find that these subconscious forces that are working in us come very close to the Power that made us, and they are powers, forces that are allied in the creative process by which we are made, by which we are kept alive, and by which we are healed when we are sick.

Q. Do you believe one can raise a healthy, robust child to manhood without a certain amount of some kind of meat?

A. No, one must have meat; xxx and he must have the real thing, the original thing; he does not want any bones or any secondhand meat, or any inferior sort of meat, but he wants the real thing, the original thing. And if you will turn to the first chapter of Genesis, you will find that when God made man he gave him orders that he should eat meat. Here it is in the very first chapter of Genesis. "And God said, Behold I have given you every herb bearing seed which is upon the face of all the earth, and every tree in the which is the fruit of a tree yielding seed; to you it shall be for meat." Now, that is the real meat, don't you see; that is the real thing. The fruit of the tree, and the seed of the herb, they are the things that God gave us for meat; and they

are real meat. Flesh is an unnatural and unhealthy kind of meat; that is, the flesh of animals. The flesh of an apple is normal, healthy, legitimate meat.

Q. Do not the meat eating nations rule the earth?

A. Well, now, it is true that the meat eating nations rule a part of the earth, but xx they do not rule the whole of it, by any means. Which meat eating nation rules China, for example? Which meat eating nation rules Japan? Aren't we scared half to death, some of us--I don't meanall of us--, for fear Japan will come over here sometime and do something to us? Now, the Japanese are not meat eaters. They are rice eaters and wheat eaters. They eat almost no meat at all. TMe Japanese peasant, the strongest men of Japan, the hardy, vigorous men in Japan do not eat meat at all. If they have anything at all it is just a little bit of salted or dried fish that they use for flavor for their other somewhat insipid things, and it does not really constitute any part of their diet. There are those forty millions of people in Japan who practically eat no meat at all. They can not have cattle there; they can not raise pigs, cattle and things of that sort; they haven't any room. Forty millions of people living in a country that is xxxkxxxxxxxxxxx only about three times as large as the State of Michigan. So you see they haven't any room for pastures; and we ar are going in the same direction. The time will come sometime in America when we will be just as Japan is; there is no room for pastures. Suppose the people of England today were dependent upon the cattle raised in their own country for meat. What would they do? Now, the population of the earth is increasing, and a time will certainly come when the human family will have to fall to eating one another, or else renounce the use of meat, because there is no room for the raising of the cattle necessary to supply the markets of the world. That is why the price of meat is rising. Now, some time ago there was a strike against the use of meat, and it was a very interesting strike to me, because while there were hundreds of thousands of people who took a vow that they would eat no meat for

for four weeks or six weeks, not a single person expressed any sympathy for them. Dr. Wiley did say that if we all gave up the use of meat we would all become mollycoddles; but when I met him at Chautauqua and shook hands with him, he did not call me a mollycoddle, and he did not hint at such a thing; but he said, "Doctor, I am greatly interested in what you are doing up there at Battle Creek, and I want to say to you that I want to co-operate with you in every way I can." He says, "Of course, you and I pull on different strings sometimes, but then, we are all aiming for the same purpose, to accomplish the same things, and we can work together for this thing"; and he gave me a very hearty greeting, and I was very glad to see it. So I don't want you to think I am criticizing Dr. Wiley at all. He has been brought up to believe that meat eating is necessaryx, and he did publish a little note about that. He has not stopped to think about it. Those Japanese that went over to fight those meat eating Russians--did they act like mollycoddles? Did they fight like mollycoddles? Just think of it--calling such fellows as they are mollycoddles! Now, the Chinese, 400 million of them, did you ever hear any remarks made about what they call the yellow peril? Now, why should we meat eating Americans be afraid of those vegetarian Chinese over there? Those fellows are such puny fellows, they do not have any beefsteak; they are brought up on rice and things; why should we be scared and talk about the yellow peril when those fellows haven't got beefsteak and can not get it? We can beat them, of course, because we have got beefsteak on our side! You see, my friends, nobody has a bit of faith in that thing, when you come to get down to the truth about it. The fact of the matter is that Dr. Ramarao said at the great medical meeting at Toronto a couple of years ago, when Dr. Halliburton the great English chemist, got up and objected to a paper somebody had read, about Dr. Chittenden's low protein ideas. He got up and denounced it. He said, "Don't we know that a little handful of Englishmen down there in India are holding all those millions of vegetarian inhabitants, of that vegetarian race u

under control? It is English roast beef that does it." And he really thought it was true, I suppose. He had not reached his seat before a splendid Brahman with a swarthy complexion was on his feet and he said, "Dr. Halliburton says that the Hindu ~~xxxxxxx~~ can't fight because he does not eat meat. Now, I am perfectly willing to admit that the Hindu does not fight, but it is not because he can't fight; it is because he does not want to fight. I am a Brahman; I have never tasted fish, flesh nor fowl, nor eaten eggs in all my life time, nor my ancestors for many generations back; they have never tasted any of those things. If there is any gentleman here that wants to test the quality of my physical development, I shall be happy to meet him this moment. I am the secretary of the Athletic association of Madras." Well, now, Dr. Ramarao,--for he was really a very cultivated gentleman, a professor in a medical college of Madras, a Brahman, a thorough bred Hindu,--never tasted flesh in all his life, nor his ancestors for hundreds of years. He was one of the finest looking men in that whole assembly,--a large, tall, splendid broad chested, broad shouldered man, an athlete, and he was an argument that they could not meet. Well, the whole medical assembly, the great British Medical Association recognized the fact that the argument was answered, that Dr. Halliburton's argument was completely answered by the man himself. They did not require any more argument when that man stood up there and challenged the whole assembly, and there wasn't anybody willing to accept his challenge; so they gave him a most tremendous ovation; and that is the answer to that argument, and I don't think anybody need to say any more about it because it has been answered, and the medical profession evidently recognized the fact that it was answered. Dr. Ramarao came over here and stood right where I am standing to answer questions that were thrown at him by the assembly, and in the most lucid manner and with the most eloquent diction; and as I sat here I envied his command of the English language. This man from a heathen country that we look down upon spoke the English language better than I can speak it, and better than I have almost ever

heard it spoken in my lifetime; it was a delight to listen to him. I had two or three days' visit with this man and he is one of the most cultivated gentlemen I ever met in my life, and it was really a delight to know him. I hear from him occasionally. He shows what is the result of these long years of degeneracy that come from going without meat, don't you see? That man is a fine specimen of the long years of degeneracy txxkx or lack of meat,--of what it has done to build up the body and make it strong and vigorous. I was reading Thoreau's Walden the other day. One of my boys was having an attack of tonsilitis, and I got a little of it myself, so I have been keeping out of sight for a day or two do I would not give it to anybody else. And I improved my time in running over Thoreau's Walden again; and if y u have never read it I wish you would read it. It is one of the most delightful things. It has some spots that you can skip over a little rapidly, but there are so many most delightful passages in it, I think it is well worth while to read it. He has discoursed upon this subject of diet. He didn't eat any meat. For eight months he lived up there in a little house he built in the woods near Walden pond, for five years, and he kept an account of all he ate for eight months and the cause, the actual cost that he had to pay out for food for that eight months was $8.64. It cost him just 27 cents a week. That was the exact cost--twenty-seven sents a week. And he had all he wanted to eat, improved in health and had a fine time . He lived chiefly on rice, but he raised beans and sold the beans and bought rice instead of beans. He found rice was a finer food, and corn and rye. He made hoecake with a mixture of rye and cornmeal, and he had a most delightful time. One of his neighbors, a farmer, said, "Oh, Mr. Thoreau, if you don't eat meat, you can not make bones", and he says, "What a silly fellow that farmer was; there he is driving his ox before him to plow up the ground, pulling that heavy plow and yanking him along after it, and that ox is making his bones with vegetarian food, out of grass; yet

that man thinks he has got to eat the ox in order to make bones for himself. There the ox was a perpetual argument to the man that bones could be made of something besides flesh. This doctrine that flesh is a necessary article of food is pretty nearly exploded, and I think very few who have given it any thought have any faith in it at the present time. Open up your windows tonight and give yourself a good night's outing during the sleeping hours. Thank you for your attention.

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QUESTION BOX LECTURE

At the Sanitarium Parlor, Battle Creek, Mich., Monday, September 26, 1910,

At 8 P. M., by,

Horace Fletcher.

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Ladies and Gentlemen: Dr. Kellogg was called away. He has gone down to Rome, Georgia, and he asked me if I would not take his place here at the question box tonight. I told him I could take it, but I could not fill it; and I havd no expectation of being able to fill it. I presume this box is filled with questions which nobody could answer, and if happily that is the case, then I will be able to answer them, because nobody will know any better.

Q. Is the pulp of grapes digestible without thorough mastication?

A. Which seems impossible. The pulp of the grapes is digestible without the mastication, but the seeds of the grapes are not. As far as mastication is concerned, in connection with the pulp of grapes, mastication is merely a means to an end; it is for the purpose of bringing the saliva in contact with the food of whatever nature. And it depends largely upon the kind of grapes. Very acid grapes require more of the saliva to modify the acidity and some of the sweeter grapes do not; but the interesting thing in connection with the careful tasting of food whatever it may be, fruit or otherwise, is that the food will remain in the mouth as long as anything is needed to be done to it. So if you take one grape into the mouth and in extracting the taste from it it swallows very quickly, you may rest assured that it required very little saliva; but if, as in the case of acid grapes, sometimes it remains a long time in the mouth; it is hard to dissolve, as it were; it is a sign that the alkalinity of the saliva is required to modify the acid.

Q. What is the cause of small white spots appearing on my hands ofttimes and gradually getting larger?

A. I should have to examine the spots with the microscope, and then I should have to know the life history of the person bef ore I could answer that question. There are all kinds of white spots. Some of them are healthy and some are not; and not only that, but this person hhs not revealed to me whether he or she is black or white. How can I tell? If it were a negro, white washer, and these small white spots should appear and grow larger, I should say he was getting to be industrious.

Q. I have an enlarged liver. Is it a good plan to take a fast to reduce it?

A. I think I would have to refer that to the medical corps. In the first place, unless the person is in the care of a doctor, how can they tell whether the liver is enlarged or not? It may be the heart. There is a whole bunch of those organs situated in this portion of the anatomy, and it is pretty difficult. I think I shoudd have to refer that to the medical corps. I hope these are not medical questions.

Q. Should grapes be chewed or swallowed whole?

A. Less stone and skin. I don't believe it is well to swallow anything that naturally separates itself and clogs in the buccal pouches, as do the stones and the skin of grapes. It is a peculiarity of food which is indigestible--it is not a peculiarity but it is a characteristic of food which is indigestible, that if it is carefully treated in the mouth, the portion which is indigestible will separate itself and collect in the buccal pouches. For instance, in the case of grapes, you may take one grape after another, and with the lips and the tongue separate the seeds from the pulp, and you will find that they will collect; that while the pulp is swallowed, the seeds will collect in the buccal pouches in the

in the cheeks and remain there until they are put out, unless they are forcibly swallowed. I think it is dangerous to swallow anything that Nature does not swallow itself.

Q. I am told that a person that is very nervous should take plenty of exercise. I am also told that a person who is nervous should take absolute rest. I am very nervous. I would like to know which I shall do--exercise or rest.

A. Now, that question of nerves is one which is very much in dispute. We all know that there are certain filaments scattered about throughout the body, in fact, coming in touch with almost every cell, and that these filaments are like the wires used in telegraphing, and they care sensations back and forward from the brain and intermediately, to the different ganglia; but whether what we call the symptoms of nervousness are a cause or a result, it is impossible to say. In this case, I might answer this in a general way by saying that the body itself knows what is best for it; and if the body craves rest, I believe in giving it rest until there is a desire to get up and move. Some people perhaps woul fall into the habit of what you might call the lazy habit, but I believe it is better to do that than it is to take perfunctory exercise without first getting the energy with which to take the exercise. You can get into the habit of idleness or laziness, of lying down, to be sure, and that is a very unfortunate state to be gotten into; but in this case, the alternate rest and the alternate exercise, of course, are the only proper way in which a body can grow. I happen to recall in speaking of the question of deferring to the body to find out what the body wanted, a number of years ago in the city of Houston in Texas, James J. Corbett, wo was at that time the champion heavy weight pugilist of the world, was there with a company, and a party of about forty doctors met there for some purpose, and they asked me if I would not use my influence with gentleman

Jim to come and give an account of his method of training, his methods of diet. He did so. He had been at one time a boy in a gymnasium of which I was president on the Pacific Coast, a good many years ago, and he came very willingly, and he answered all the questions that were put to him as to his methods of diet, and then someone asked him the questiom, "Well, what do you do about your sleep?" "Oh," he said, "That is easy. I go to bed when there is nothing else doing, and I get up when my bed gets tired of me." I believe in following the natural impulses in order to find out what the desires or requirements of Nature are.

Q. How long should oatmeal be cooked?

A. I wonder if Dr. Kellogg could answer that question. I think that question had better be asked up in the kitchen. I certainly don't know. Is there anybody here can give any information? Should it be cooked three minutes or three hours? I know Boston baked beans require twenty-four hourse to cook, and what is the relation between oatmeal and Boston baked beans? Is there anybody here who will volunteer an expert answer on that question? Nobody seems to know.

Q. Is chewing gum a short time after meals an aid to digestion?

A. Dio Lewis, whom perhaps some of you know know, thirty or forty years ago laid great stress upon the advisability of chewing spruce gum. It was before any of the patent gums, the Spearmint, or Wrigley's, and all that sort of thing were invented, and before it had become a habit; but in the country it was customary to get the pitch from the spruce tree and chew it, and Dio Lewis made quite an attempt to popularize the desirability of chewing a little bit of spruce gum after meals in order to aid digestion; but that is not at all necessary if a sufficient amount of chewing is given to the food. The only object in a case of this kind would be to furnish an amount of saliva, and too much saliva is of no avail. Just the right amount is wanted. I do not

think that under any circumstances the chewing of gum is either healthy or beautiful. I know in my trips to Europe where gum is not chewed, excepting by the American tourists, you forget that there is such a bad habit in the world; but if you land in this country, the first thing you see is an immense amount of jaw movement, and of course I am very much biased because the people think they are all fletcherizers which they are not. They are merely imitation fletcherizers.

Q. For what purpose whse the fowls of the air and the fishes of the sea created by an all-wise Providence if not for man's nourishment?

A. Now, I may answer that question by returning with a question, "For what purpose was man made if it was not for the nourishment of cannibals? He is just as good meat as a chicken, and I think that a tender infant would be superior even to a spring chicken. So that ~~thexxinpin~~ I simply offset one question with the other.

Q. If nature did not intend that man should be omniverous, why was he equipped with cutting and tearing teeth rather than with grinding teeth of the sheep, horse, cow, etc?

A. This is a question that has been asked from the first time vegetarianism and meat eating were discussed, and Dr. Kellogg answers this question with scientific completeness when he speaks of the anthropoid ape as equipped in very much the same way as we are, with teeth who, when following his natural impulses, takes only vegetable food. Now, in the case of man, we have been endowed with more kinds of instincts and more kinds of faculties than any other animals, and we have been permitted to occupy more different kinds of country, different latitudes; we can live upon the food which is available in the Arctic zone, or we can live in the tropics. I think I can give the best evidence on this subject that can be given from any source whatever. When I entered into the study of this subject of nutrition, I belived that meat was the most concentrated

form and the best possible food for man; that it was to the advantage of those who were able to have meat, and those who did not have meat were sufferers in consequence; but in following the study of taste, of the natural requirements of nutrition; in getting at my own equilibrium of nutrition in an automatic manner, which is the aim and the result of fletcherizing, my taste for all meats sloughed off. Now, if that is not the best argument that can be given; if I in studying, and when prejudiced in favor of meat should find meat that I did not want it, and finally put it aside, it seems to me that is true physiological evidence; and inasmuch as the practice of doing without meat, living on a low protein diet, results in a greater endurance, greater comfort, much better nourishment, much better health, as is being evidenced by the tests which are going on all over the world, it seems to me that there are two separate bits of physiologic evidence which prove that meat while it may be an emergency food, is not the natural food, under the conditions where we live. Now, in studying this subject very carefully, not allowing myself to be harnessed with a prejudice, if I can help it, I do not advocate as a prescription any form of diet. Whatever Nature permits as a food, I have nothing to say against; but all the evidence is that under ordinary circumstances, we are better off without the meats, because they cause too much nitrogen intake, and too much nitrogen is the source of autointoxication, and autointoxication is the source of all of our disabilities, I presume, even down to these little white spots on the skin that came in the first question; and they certainly are the result of a disability in this respect, that the highly nitrogenous foods, the meats, cause very much more of a nitrogen intake; and leaving them off reduces the cost of living on an average fully forty to fifty per cent. All of the evidence is in favor of it. Now there may be times when man under certain circumstances needs these emergency foods. We are given a much wider latitude than any of the animals; bu

but still if we study the subject to get the best results, we will find that mea meat is not the best food, and consequently is unnatural for our conditions of life.

Q. This question is asked from a sincere desire to know the truth, and is signed "Harvard graduate, 1898."

A. Now, there is something interesting. Here is a young man who was graduated from Harvard in '98, and still he does not know the first principles of the chauffering of his own corpomobile. He asks that question seriously and says "If I can eat meat, shouldn't I eat meat?" I can answer that question by saying, it is entirely possible for him to eat a baby. Should he eat a baby? Obviously not. It is also the case--and that knowledge ought to be open to every graduate of Harvard, and not only every graduate of Harvard, but every graduate of the kindergarten, that if the birds of the air and the animals of the earth and the fishes of the sea are taken as food, there will be an excessive amount of nitrogen ingested into the body; there will be autointoxdcation, there will be rheumatism, there will be gout, there will be Bright's disease, and all those diseases of luxury from which we suffer. Now, isn't that a test? Almost all of us who are here are here for the purpose-- I won't say almost all of us, because I am not here for that purpose; but most all of you who are here are here for the purpose of correcting by heroic and perhaps tedious means the ignorance relative to nutrition. Andthat might be the case of those coming up along without any ef particular attention to the subject; but isn't it a commentary upon our education that a person graduated from Harvard in '98 should be asking questions of that kind? Shouldn't he know all about it? ~~Shouldxhexxxtxkxa~~ Why, he could not get a certificate to run his corpomobile if he were required to have one. He could not go back to Harvard and get a certificate to carry himself about one day. And yet, this is relative to the most important thing in life.

Q. I have had for a year or more a deep soreness of the muscles or bones of the whole body? What is the cause of this?

A. Obviously autointoxication. There is no other answer. Excessive nitrogenous food. Almost the first expression of an excessive amount of nitrogen in the body is susceptibility to fatigue, to lack of endurance.

Q. Where do you consider the best place to take a consumptive patient as regards climatic conditions, treatment, etc.?

A. Right outdoors ,whether it be in the Arctic zone or whether it be in the tropics. That is common knowledge nowadays; there is no difference of opinion about it. Take them right out doors, give them fresh air, and as much sunlight as possible, so that it is not a question of climate. Of course, the high altitudes where it is comparatively warm and the air is particularly fresh are desirable, but I believe that right in the midst of any of our pine woods, if we would turn out that there would be found the best cure for any of the tuberculous diseases.

Q. As a sweet food for dyspeptics, how does bees honey compare with malt honey and sugar?

A. Why, I would not dare here to say anything prejudicial to malt honey. I am looking for Dr. Kellogg's favor much mo e than I am for the favor of the honey bees. There is less sting in him.

Q. What is the best treatment and diet for one having some catarrh of the stomach?

A. Fletcherizing. As far as the diet is concerned, just what the appetite will call for. And I could not prescribe what the diet should be; but I know that the very best way to overcome catarrh is to fletcherize, whatever is palatable.

Q. What is the difference between W. K. Kellogg and J. H. Kellogg, M. D.?

A. The difference is that they are brothers, and not twins; and notwithstanding the fact that you have seen that there is a controversy between the Corn Flake Company and the Kellogg Food Company, a legal battle on that controversy, it does not obtain between the brothers at all. It is merely a question of business; it is merely the establishment of a right to the use of th name Kellogg, and withoutwanting to prejudice the court in any way whatever, I do not see why Dr. Kellogg, who has made the name Kellogg honorable all over the world, should not have a right to the use of his ow name. And I am very much prejudiced, and I do not want to prejudice the court against the commercial interests who are suing to prevent him using his own name in connection with the beautiful foods which he invents. Oftentimes we see in the newspapers what seems to be, or there are really controversies between really the very best of friends. It is merely to establish a precedent, or to settle a point legally.

Q. Do you consider the wearing of a belt hamnful?

A. I would take Dr. Kellogg's evidence upon this subject. The wearing of a belt is a very good thing for the holding up of the viscera, and if you are xxxfortxxkkxxxx fortunate enough to go into the X ray room and to see some of those photographs of the fallen stomachs, the relaxed organs where theyx are entirely out of place, and placed away down into the abdomen, you would think that it would have been a very good thing to have worn a belt. The belt and the corset are two different things. If the one depresses,the ribs and crowds the vitals down, it is a bad thing. But the mere holding up of the abdomen I think is a very good thing. One of the strongest and one of the healthiest men I know in the world, the man capable of doing xxxy the very best work I know of

wears a belt habitually, and that is Gen. Leonard Wood, our chief of staff, and Dr. Kellogg himself wears a belt, and has worn a belt for years. I wear one, and I think it is an excellent thing to wear a belt which will holdup the viscera. Now, those are all of the questions put into the box, and we still have some time. Are there any questions to be asked verbally, If not, can any one give me a text for treating this subject further. That is, the question of the basic requirements for health? Has anybody a question?

Q. Can eczema be cured?

A. Eczema can be cured very quickly and very easily simply by fletcherizing. That is one of the diseases I happen to know about, because I have the evidence of a great many people that eczema has disappeared as the result of careful fletcherizing. Now, the question may be asked, what is careful fletcherizing. You may go through the mechanical act of masticating the food and still you may do it in a way that will defeat the purpose. That is the whole question of right nutrition; that is, the maintaining the automatic equilibrium of nutrition which means the furnishing of the body just what it wants for its most economical use and no more, is somewhat a complicated process. Under primitive conditions for which the body of man was made to cope with, it was not necessary to think about this subject, because the foods were found in such form that it was necessary to chew the nutriment out of them. For instance, there were no foods found in a pulpy form, or in a liquid form. If you wanted to get the sugar from the sugar cane, you had to chew it out with your teeth, and in the same way, if you wanted to transform the sugar which is in the beet into the sugar of commerce, you would have to do it with the ptyalin of the saliva; it was compulsory; but under present conditions, where we have such complicated foods, such mixtures, heavy foods, liquid foods, spiced foods, mixed foods, it is necessary that we should understand the science of the ingesti

tion and the digestion of food, in order to protect us from this menace. So when I speak of fletcherizing as being a panacea for many of the disabilities which we suffer, I must explain that it is the getting of the nutriment out of the food as you would be compelled to do it under primitive conditions. And many people are worrying half to death and going to the table with an all gone feeling, with a lump in the pit of the stomach. They are worrying about themselves; they are worrying about the people at home; they are worrying about business. Under those conditions, it is impossible to get the best nutriment out of the food, and there will be more or less indigestion. The whole idea is to make of the taking of food a sacred function; you are serving at that time on the altar of your own efficiency. You can eat for morality or immorality; you can eat for digestion or indigestion; you can eat for temperance or intemperance; consequently it should be looked upon as a sacred function, and food should be approached in that way. No one should go to eat food unless he had a well determined appetite, an earned appetite. And perhaps there are some here who have not been here at times when I have lectured upon this subject, and it is necessary to know what a true appetite is. None of these sensations that we feel in the pit of the stomach, or in the body generally, none of these sensations felt below the guillotine line are sensations of hunger; but the reverse. It is fermentation af in the stomach,of some former foods, or simply craving, a habit appetite which is the same with regard to food as the xxxx craving for more whiskey after a person has been on a debauch, so that you pay no attention whatever to any sensations below the gui llotine line. Above the guillotine line, all the senses are bunched. There is whereyou enjoy the food, where you get the taste out of it; but what you want to do is to realize the fact that you are not hungry until you have a keen desire for some simple food, accompanied by watering of the mouth; and when you have that, and when the food which you take into your mouth, the food

which appetite selects, actually melts in the mouth, and swallows itself, you may know that the body is as hungry for that food and that particular kind of food as is a dry piece of blotting paper for moisture. You know if you have a drop of water on the table, and you take a piece of blotting paper and you do not need even to touch it, you put it approximate to it, and by capillary attraction it will lift the water, suck it up, and distribute it throughout the paper; and in the same way the body when it is hungry is like a piece of dry blotting paper, and it is ready to suck up the nutriment which the appetite selects. So that that common saying of food so good that it melts in the mouth, swallows itself, is a true physiologic description. So we must in the first place be sure that the body wants food; we must give the appetite an opportunity to discriminate properly as to what kind of food out of the menu is desired, by the body; and then we must reverently get all the good taste out of it while it is there and let it swallow itself when the taste has been extracted from it. And I can tell you again in a few words what of the different uses Nature makes of taste. Not only is it serviceable in asking us, that is, in inviting us to eat food, in descriminating as to the food; but it serves as a signal to the rest of the body to convey the intelligence as to what is needed. For instance, you have a piece of bread in your mouth. When you take it into the mouth, there is seemingly no taste whatever. You begin to masticate. The saliva flows; the ptyalin of the saliva attacks the starch of the bread. There is a chemical change. Thax It is transformed into glucose, dextrose, or grape sugar which is the assimilable form of starch, and a delicious sweet taste develops as that process goes on, and you enjoy it immensely. Now, that taste makes bread very attractive; but at the same time, by the medium of the great vagi nerves, which have terminals, thousands of them, on the wallsof the stomach, it is just like sending a telegram to the stomach, that a certain amount of bread

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containing so much of the carbohydrate, so much of the protein, and so much of the mineral salt is under process, is preparing for the body, and to prepare for it; and consequently the stomach will exude from the glands just the amount of hydrochloric acid, thexdiffexent orwhatever else is needed for that purpose, and that is poured out into the stomach; so before the food arrives there, whil e you are still enjoying it, this digestive bath is being prepared for it; and finally when it is swallowed, it drops through the cardiac opening of the stomach, and falls into this digestive bath. It is then a very easy matter, because every preparation has been made for the stomach digestion, and every preparation has been made all the way through the body. And that is the definition of fletcherism--the getting of the good there is in itx things out of them by the most economical means with the least trouble and expense, and conforming to the natural requirements.

Q. Is autointoxication accompanied by chilliness?

A. I don't think so necessarily. Chilliness is caused by the deflection of the blood from the surface; that is surface chilliness. Many of us know that after a hearty meal, for instance, you will see a person get up from the meal and go and stand before the grate. And it is a well known fact that the blood is diverted, drawn to the stomach for purposes of digestion, and is taken away from the surface. I believe that is the only cause of chilliness; that is the deflection of blood from the surface; so it might have a relation to autointoxication; it might be connected with autointoxication or might not; but it is natural to suppose that if there is trouble with autointoxication the blood is being occupied with that; so this would ensue.

Q. Are oysters a good food?

A. Dr. Kellogg says that they are the worst kind of food; and I am

not here to deny any of Dr. Kellogg's assertions, and I will tell you why. Because, having drawn a line on Dr. Kellogg myself, and having known other lines to be drawn on him by scientific people for the past seven or eight years, the final reports have been that Dr. Kellogg is usually right. Sometimes he is five or six or ten years ahead of the time; so that he has not all the evidence at his disposal at once; but as far as I know, all of the contentions which Dr. Kellogg has made and has stood for have been proved to be correct. At the present time typhoid fever is supposed to be disseminated largely through oysters, and under those conditions they are a very bad food.

Q. Why do people have autointoxication that don't eat meat?

A. Do they? Are you sure they do? You may be asking a question that is not tenable. It is entirely possible,--for instance, you can take all the white of egg you want, which is pure albumen,--you could get an excessive amount of nitrogen and autointoxication from that source; or you could get it from a superabundance of beans. In beans and lentils and in some of the vegetables there is an excessive amount of protein, and consequently we know not that we can take beans habitually right straight along without having trouble. I think among the persons who do not eat meat that autointoxication is quite rare.

Q. Is it possible to get too much saliva into the stomach in masticating your food?

A. I don't think that is the case. It is chewed, and certainly that sort of trouble is the result of getting too much saliva into the stomach. I don't believe that is true, because the saliva is absorbed almost immediately, and if there is any excess of it, it is just like an excess of water; it is absorbed and goes off. But there may be trouble arising from too serious and too intense attempt to chew hard. Anything of that sort is bad, and defeats the

purpose, so that while the saliva itself might not be injurious, the attempt to create a great quantity of saliva during chewing might have that effect.

Q. Explain what you mean by watering of the mouth.

A. In babies we call it drooling; that is a free flow of saliva. For instance, if you think of something pleasant in the way of food, and your mouth fills with saliva, that is called watering of the mouth.

Q. How about the use of milk and cream in the diet? Is that advisable?

A. Milk, of course, is the one perfectly balanced food. I have lived on milk for seventeen days, once, in an experiment; and nothing else passed my lips, neither water nor food--simply the milk, and the milk from one cow; and during that time I thrived delightfully, and at the end of the time, when I went back to solid food, I rather missed my milk; I got into the habit of it. But I presume that milk may not be the always perfectly balanced food for the adult; of course, it is for the child; that is, mother's milk. Milk taken from the mammary glands directly and transferred immediately to the stomach is a perfect food; but milk which has stood any length of time, or has been mixed at all with water, immediately begins to change; there are bacterial changes and in that case it has to be gotten back again by connection with the saliva. I will say in that connection that milk is the only nourishment I know of that is not tediously monotonous. You know, Nature abhors monotony the same as she abhors a vacuum; and that is one reason why, then, it is desirable to move about from pasture to pasture to get different kinds of food; although you can circulate around within mama's menu very easily and keep in the best of health.

Q. Iscoffee wholly bad? If so, considering its widespread use, its delicious taste and aroma, and all that, what was the object in its creation?

A. I will answer that question by saying that whereas there may be a

certain amount of pleasure derived from it, a mixture of coffee and milk and sugar, or coffee along--you can learn to like anything; it has no nutritive properties. On the contrary, it is a depressant. If you take it in sufficiently strong concoction, and in sufficient amount, you can work up a cast of lumbago or sciatica.

Q. The same can be said of Boston baked beans?

A. No, I never knew anybody to get sciatica from Boston baked beans. Now, Boston baked beans are nutritive, and coffee is not; and it is among the unprofitable indulgences; that is, those which do not build up; and it will poison. Now, you can not take it in sufficiently small amount not to have it do some harm; you can take in small enough quantities not to do any appreciable harm, but still what does harm if taken in larger amount must do some harm when taken in smaller amount. Coffee is one of those habits which sloughs off very quickly, and more particularly after an experience with inanition, coffee, tea and all those artificial things which are among the unprofitable indulgences, the taste for them sloughs off.

Q. Is it harmful to exercise right after eating?

A. There is no harm whatever in exercising right after eating if you have eaten properly. If there is no excess of food in the body, if all which has been taken has been wanted, and assimilated, there is no reason why anybody can not exercise immediately after eating, and without any trouble whatever; and that I know from long experience and from the experience of others.

Q. Is there any harm in going to sleep for five minutes after taking food?

A. Sleep for five minutes after you have had your dinner? No, no harm in sleeping five minutes or five hours, if you are sleepy; none whatever.

Q. Some one has told me it was very harmful, and that Dr. Kellogg

has said it is not right at all; you must not go to sleep right after eating.

A. Well, you know, if you will ask enough questions, you can get as many answers as you ask questions. You can get people who will tell you sunlight is bad for you; and other people will tell you that there is no necessity for taking any food at all. And some among the mystics say it is simply because we are poor sinners that we are compelled to take any food at all; and that after while we will get all of our nourishment out of the ether; we won't even have to breathe air. We will simply have to think of the ether, and we will get full nourishment.

Q. If one takes a nap once a day, which is the more desirable time, beforemeals or after?

A. Now, you have either got to take it before or after. And whenever you take it, it is before and after both. The best time to take it is between sunset and sunrise. I can not tell you a little story that is rather interesting. That was about a club man in New York. A friend of his came into the club one day and he was sitting there looking very moody, and somebody said to him, "Jim what is the matter with you?" "Insomnia." "Insomnia? Can't you sleep nights?" "Oh, yes, I can sleep nights all right, but I can't sleep day times."

Q. Does digestion go on while you are sleeping?

A. I believe it does, but not as rapidly, because the blood is circulating very much less rapidly. I believe that sleep, whereas digestion does go on to some extent during sleep, I believe sleep is more for the recuperative processes. All of the consciousness is quieted for the time, and the body in repose is recuperating itself. Metchnikoff, in whom I have not very much faith, says that he believes that it is for the purpose of getting rid of the autointoxication. We all know that a sleeping room, if it is closed, becomes foetid very quickly. Now, the question whether the breath is freighted with the products of

autointoxication during sleep more than it is during the waking moments, I am not prepared to state.

Q. I know a man who begins to perspire whenever he sits down at the table and begins to eat, whether it is warm or cold. Can you explain it?

A. I think that must be a pathological condition, and I am not prepared to answer that question. I have not known of a case of that sort. It may be that it is extraordinary excitement. It ~~ixx~~ may be that it is the same as blushing when you meet your best girl. I presume there is that feeling of timidity in the presence of something he is very fond of.

Q. Is there any harm in exercising before meals?

A. None whatever if the exercise is agreeable. And I may sey in this connection that Nature is one of the most delightful partners in the world. She never asks us to do anything that she does not make pleasant for us to do; and it is the very best test in the world that you enjoy a hot bath, if you enjoy it, take a hot bath; if you enjoy a cool bath, take a cool bath. Nature pats you on the back if you are filling her requirements.

Q. Is inflammatory rheumatism curable?

A. I have never known any cases of rheumatism that were not curable. And they are amenable to the reduction of the protein in the food. Now, let me tell you as a closing remark that one of the underlying principles of fletcherism is to have nothing in excess. We have had a beautiful time here for an hour, and it would be an imposition to go on for any longer time. I thank you very much for this opportunity to fill Dr. Kellogg's place.

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OUR DEVOTED FRIEND THE LIVER.

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday, September 29, 1910, at 8 p.m.,

By

J. H. Kellogg, M. D.

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The liver is one of the best friends the body has. It is one of the most faithful, hardest worked, and least appreciated organs of the body, and the one that most seldom has anything the matter with it. The liver very rarely fails to do its duty as well as it can possibly be done under the circumstances. When the liver fails in its work, it is only because it has such an enormous amount of work laid upon it, so much more than it is possible for any liver to perform that it simply can not do it. The liver is often overworked, but it is never sluggish; it is never lazy; it is never dilatory; it never fails to do the very best that can be done under the circumstances.

The liver is one of the most wonderful organs in the body. I do not know of any organ in the whole body except the brain thatxhas is more wonderful than the liver. Now, it looks very simple and very commonplace, --just a big, brown, chocolate colored mass lying up here in the chest really, or above the lower border of the ribs . Be sure you knowwhere the liver is. A lady told me some time ago she had a terrible pain in her liver, and she put her hand away over here on the left side somewhere. That is not the place to find the liver. The liver is above the lower border of the ribs on the right side. Here is the liver up here. Sometimes you find the liver elsewhere, it is true. I really did fin a lady's liver once about six inches away from where it ought to be. It really had been turned xt out of house and home; it was wandering

around where it did not belong. Now the liver, as I said, is a wonderful organ. There isn't any other organ that does so many different kinds of work as the liver. No organ in the whole body that does so many different kinds of things as the liver. It is a real Jack-of-all-trades, and it is good at all of them. It is an expert at all of the different kinds of things it has to do. Now, we are all familiar with one thing the liver does. We all know the liver makes bile. And we sometimes think,--I have known people who thought the liver was out of order because there was so much bile. I met a man some time ago who came here from Indiana, and he wanted his wife to have something done for her liver. He said, "Look here, Doctor, she has vomited a quart of bile in the last two hours, and there must be something the matter with her liver that she should vomit so much bile." The liver was certainly very industrious, making a quart of bile in half an hour, and it was working very hard. There was no reason to find any fault with that liver certainly. We must use a little commonsense. When we bring charges against a party, we ought to know some good foundation on which to base those charges.

Now, the liver makes bile, and what is bile? It is a remarkaly interesting fluid. In the first place, it is an excretion, it has power to kill and destroy life; it has a poisonous power six times that of the secretion of th the kidneys. It takes only about an ounce and a half of the kidney secretion to kill a rabbit that weighs two pounds. A rabbit weighs two pounds, and an ounce and a half of urine injected into the rabbit's veins will destroy its life within twenty or thirty minutes, kill it; it will die in convulsions. That is one of the discoveries made by Prof. Bouchard, the great French physiologist. But he found when he injected bile into the veins of the rabbit that it only took one sixth as much bile to kill the rabbit as it did of urine to kill the rabbit of the same size. So it has six times as much power

of urine to poison; it is six times as powerful a poison as urine. Why? Because it contains the most toxic, the most poisonous of all the waste substances of the body--the alkaline wastes. The urine contains the acid wastes, while the bile contains the alkaline wastes, and these wastes are largely derived from the broken down wornout, dead blood cells.

Now, the blood cells all have a definite life. The blood cell is born, does its work, it has its use; it has adult age, grows old, and by and by becomes infirm, and senile, and dies. It takes just six weeks for one of these little red cells to go through this cycle of life. Six weeks. Born, grows old and dies. What becomes of the dead cells? Eight million of them are dying every second. Eight millions of them die every second. Think of it. Every time the clock ticks, eight millions of these cells are dead,--eight million, eight million more, eight million more--think of how they pile up those dead bodies in the blodd. Well, the blood stream would very soon choke so that the living cells could not circulate and do their work in the body, if it were not for the liver. The liver is a great rendering establishment where these blood cells are collected, and destroyed and ground up, so to speak, and made into useful material in part, and in part eliminated from the body as poisons.

You know what a rendering establishment is. A man told me some time ago that worked around the freight depots in Chicago that it was his business to attend to switching cars and he found certain cars came from certain parts of the city loaded with diseased pigs and other creatures, and he watched them to see where they went, and they always went over to a certain rendering establishment, and he observed certain cars came away from that rendering establishment loaded with oleomargarine butter; so he found out what became of the dead and sick beasts from the slaughterhouses. He was a man who had worked for a good many years in the switching department of one of the great railroads there, and

he told me that,--a patient here some years ago. I do not mention it very often, but I haven't any doubt that he told me the exact truth about it.

Over in London there was an investigation made some time ago as to what became of the dead horses, and it was really very interesting--the fate of those dead horses. They were not any of them accorded a decent burial, although they had lived useful lives, very respectable lives, they were not accorded a decent burial, but they were treated in a shameful way. They were taken up to a rendering establishment and the flesh and bones were made into fertilizer, the hides were made into leather, the hoofs into calves' foot jelly, and the livers were roasted and ground up into coffee. Now, t e liver is a most wonderful rendering establishment. It takes these dead blood cells and grinds them all into something useful, converts them into something useful, except the poisonous part, the alkaline part, or the potash which goes off in the bile as a very deadly poison.

There is the liver that we are talking about. You know when you were children, if you lived in the country, there used to be a barrel out behind the barn somewhere, that had to b e filled up with ashes, and some water poured in every day, and there was a deep iron kettle down underneath, and the lye ran down into that iron kettle. And once in a while, all the bits of fat, the odds and ends of fat of various sorts were gotten together and boiled up and melted in the big soap kettle, and the lye was put in, and some soft soap was made which was very useful in some operations about the house. Now, that lye was the residue, the ashes, the alkaline wastes from the stove. The bile is in a certain sense the lye of the body. The alkaline wastes. It contains potash just as lye contains potash, and it is alkaline liquid, the bile, is useful on that account. The alkaline substances enter the intestine and combine with the fat we eat, and the various sorts of fat, the butter and the oils of various kinds combines with those fatty particles and forms soap, and after the fat has

fat h s been made into soap, it then dissolves in water, is soluble and can be absorbed. In the form of fat it can not be absorbed; but it is all converted into soap before it is absorbed, and the bile is one of the means by which this is accomplished. It aids in the absorption process by converting the fat into soap. The bile, as you see uses it, aides the process of conversion.

To some degree this bile is antiseptic. It is a natural laxative; it stimulates the activity of the intestine, so it has a very practical and useful purpose. This bile has five or six very important and essential purposes, but we have only given you one of the offices of the liver, the making of bile. But the bile accomplishes five or six different things; but the liver does other things. As I have already indicated, there are several other things the liver does. It burns up, breaks up, dissolves the red blood corpuseles and converts them in part into bile. They go to make bile. It also takes out of the red ells the coloring matter, and this coloring matter is used to tint the hair. It is also used to color the back side of the eye, the dark room in which the picture is made. When we look at objects, there is a picture bleached upon the curtain in the back part of the eye, so the picture is formed in white on the curtain, but in order that we should have a new picture, the white picture should be rubbed out by a deposit of new coloring matter; so there has to be a continual process of staining the curtain black, coloring it, in order that we shall be able to see objects. If we look at it objects too rapidly, they get mixed up, because the pictures which are bleached overlap one another; but if we give the eye a little time, it is able to keep the curtain in perfect condition by depositing this black or dark coloring matter which is made out of the red blood cells by the liver; so that the body is a great economist; you see, it saves the pieces, saves the waste, and even renders the garbage, so to speak, so as to make some valuable material out of it.

Now, another very remarkable thing the liver does, and an extremely interesting thing, is this. Suppose you have water coming through lead pipes, and there is a little lead dissolved in the water, you can go on drinking that water that comes through those lead pipes for a long time, perhaps, xxax years, before you begin to suffer any ill effects from it, and why? Because the liver seizes upon that lead. All that lead that comes there into the stomach is carried through the liver. Here is a great vein here, the portal vein, and all the water absorbed and everything else absorbed from the stomach and intestines into the veins is carried through this large vein to the liver and distributed all through the liver, and the liver carefully examines everything that is brought through it in this way, and if there is lead in the water, it takes it out and deposits it in itself, and deposits it right in itself, its own tissues, rather than allow it to escape into the body. Now, the very same thing is true if you take iron as a tonic, the liver captures a whole lot of that iron, and tucks it away in the recesses of its own structure. If you are taking every little while a dose of calomel or blue mass or some other form of mercury, if you imagine the liver is out of order, the liver does the same thing to that mercyry--stores it up in itself.

A number of years ago when I was a medical student, some thirty-four or thirty-five years ago, I heard my professor telling a very interesting story--a man twenty-two years before had killed another man by administering some poison to him, some slow poison. He used mercury. And more than twenty years after the man had been killed in this way, some circumstances pointed toward this man as having been guilty of the murder, and the body was exhumed, and that portion of the dust that was found which occupied that part of the body where the liver was thought to have been, that portion of the remains which was nothing but dust, was examined and found to contain mercury. Whenever an examination

of that kind is made, it is always the liver that is examined, because the liver has stored up these metallic poisons, and that is a part of its duty--a part of its work is to remove from the body metallic substances of any kind, whether they are administered as medicine, whether they are taken in water, whether they are received accidentally in any other way,--it may be that they are taken in food; it may be that they are absorbed from the air of the room, or from the dus dust of the street; may be they are taken into the body in the course of one's industry and one's work. The air may contain fine particles of a metallic substance; but however they are taken into the body, the liver gathers them up; it sacrifices itself in order that the rest of the body may be protected.

Now, there is another thing which the liver does which is still more wonderful than anything I have told you yet. That is, it destroys poisons. Poisons that are generated within the body, and poisons that are taken in from outside of the body,--no matter what the source of the poisons, if they are of an organic character, if they are of a kind that can be taken out, can be oxidized, the liver seizes upon them and destroys them.

Now, how do we know that? An experiment was made some years ago by a physiologist which very clearly showed this. Here you see is a vein that carries the blood away from the liver. Here is the vein that brings the blood in. Now, there is another vein that carries the blood away from the liver. After it has passed through the liver, it goes on into the general circulation. Now, it is found that if a poison is put in here before the blood passed through the liver, it took twice as much to destroy the life of the animal as when it was put into the vein that led away from the liver. In other words, if the liver was cut out, if the poison was put into the veins under the skin or any other part of the body, into veins leading away from the liver, in any way, so that the blood did not have an opportunity to pass through the liver, it took twice as

twice as large a dose to kill the animal; and it was found when the liver was taken out of the body, a living liver, immediately after the death of the animal, and was bruised up into a paste, and then a poisonous substance was mixed with it, like nicotin or some other organic poisons, it was destroyed; the liver had the power to destroy this poison, to somehow render it non-poisonous. Now, this is an interesting and exceedingly important fact, one of the most important things I am going to tell you tonight about the liver is this ability of the liver to destroy poisons; its function as a poison-destroying gland is of vital importance to us. If it were not for this power of the liver to destroy poisons, the first time you ever had typhoid fever, or took a bad cold, or you had diphtheria or any other infectious disease, you would be absolutely certain to die, it would be absolutely fatal; it is the liver that stands between the man that has typhoid fever, or small-pox, diphtheria, scarlet fever, or any other infectious malady,--the liver is the organ that stands between the man and death. So it is a good thing for us to be on good terms with our livers, and I hope before I get through here tonight, you will think it is quite worth while to take good care of your liver.

This poison-destroying power of the liver is not unlimited; it is only when it is within reasonable bounds that the liver is able to do its work of destroying the poisons. When the liver is overwhelmed with poisons, the poisons pass right on through, and then the work of mischief is done; but this great function of the liver, this antitoxic function, this poison-destroying function is a matter of the most tremendous importance to every animal and every creature that lives. In animals that live on a very toxic diet as, for instance, the dog that lives on a meat diet, the liver is very large. The dog has a liver four times as large in proportion to its size

as human beings have. The dog has four times as big a liver as the man has, in proportion to the size of the body. The turkey buzzard has an enormous liver, because the turkey buzzard lives upon a diet that requires an enormous liver to deal with the poisons which it subsists upon. It is a natural scavenger. The pig has a prodigious liver in proportion to its size, but most pigs, when they come to die, have poor, degenerated livers, because of the high living to which they have been addicted. If a man undertakes to live on a turkey buzzard's diet, eating Limburger or prime beef, or pate de foies gras, and other things of that sort, you can readily see he is at a great disadvantage, because he has not the turkey buzzard's liver to help him out; so if a man undertakes to live upon a dog's diet, you can see there he is at a prodigious disadvantage, because the dog has a liver four times as big as a man's, and four times the poison-destroying power that a man has; and the man on the dog's diet is at a disadvantage, has a handicap of a small liver, not adapted to the dog's diet.

Here is the gall bladder that stores up bile, so that when the person begins to eat, his liver begins to store up bile, so that when the food passes down into the intestine, the gall bladder contracts, and the liver squeezes itself and empties out its store of bile into the intestine to begin the process of making soap and carrying on the other functions which the bile performs. There is just one other thing that I should mention that the liver does which is a matter of very great importance to any of us, perhaps; that is, it prepares poisonous substances in the blood which it can not at first deal with, to be dealt with by the kidneys and other poison-destroying organs. There are certain substances come along in the blood--uric acid is one of them. The liver takes this uric acid which is a very poisonous substances, and converts it into urea, which is a slightly poisonous substance. That is a part of its work--to convert uric acid into urea. There are other substances which are allied to

uric acid which are also converted into urea, and one of these is the thein of tea and the caffein of coffee and the theobromin of cocoa; these are practically the same thing as uric acid. The liver deals with these also, and converts them into urea, so far as it can do so. It does not succeed in converting it all. When one takes large quantities of these poisons, it can not convert them all, because the liver is able to deal with only a moderate amount of these poisons, the normal output of the body is limited to a certain amount, and the liver can do that amount of work, but it can not do an indefinite amount of work.

Then another thing which is very interesting, a large part of our natural diet consists of starch. This starch is in process of digestion converted into sugar, and when the sugar is absorbed and carried into the blood by the portal vein here, and carried to the liver, the liver converts that sugar back into starch again, into animal starch or glycogen, and stores the starch up in itself, so that after a meal in which starch enters considerably, the liver is half an inch thicker than it was before the meal. That is a very interesting fact. You can often find by measuring the liver after dinner and before, that it is considerable larger. Of course, if one eats a very large dinner, the liver will be a little extra overstretched. We weighed a man some time ago and found that he weighed five pounds more after dinner than he did before; and I imagine his poor liver was in a very highly overstretched condition. It had more starch in it than it could contain without more or less discomfort and injury. Now, the starch does not remain in the liver. The liver begins to dole it out little by little, as soon as it is stored up. In fact, the liver, according to recent researches, is all the time making this glycogen. If it can get starch out of which to make glycogen it makes glycogen from it, and when it can not get starch, it makes glycogen from protein, although at a very great disadvantage, because when the liver makes glycogen from protein, the thing

that
ifxix is left behind is a highly poisonous substance, and while the protein itself is not poisonous, that is, the albumin is not poisonous, after the glycogen or starch has been taken out of the protein molecule, the thing that remains is a very poisonous excretory waste substance whih does great harm when circulating in contact with the tissues of the body through the blood.

Now, all of these interesting things the liver does. The last thing, I just mentioned to you, of storing up the sugar in itself in the form of glycogen, then turning it out little by little, is what might be cxxxxx called an automatic stoking arrangement which the liver employs to feed the fuel to the body. The glycogen is fuel that furnishes material with which to make muscular energy. It is really the fuel of the body, to keep the body warm and to maintain the vital fires of the body; so it is an artificial stoking arrangement similar to what you see in some of the large steam making plants in which there is an automatic arrangement by which the coal is brought along to the doors of the furnaces and passed in beneath the boilers, so that the fuel is kept going in, and the fire is kept going on steadily.

Now, that is what the liver is always doing. So note these different things the liver does. It breaks down the red blood cells; and eliminates the poisonous wastes from the body that are formed in this way; it collects the poisons from the body and eliminates them,--the alkaline wastes; it forms bile; it stores up poisons which it can not destroy, metallic poisons which it can not destroy; it destroys certain kinds of poisons. It prepares other poisons for elimination b y the kidneys. It acts as an automatic stoking arrangement in helping digest the starch and storing it up, and afterwards digesting it into sugar again, and passing it on into the body. So there are seven important things which the liver does, and yet the histologists have never been able to distinguish any difference in the liver cells. This is a minute portion of

the liver which shows its minute structure, and shows you how the blood vessels and ducts are distributed. Here is where the blood comes in and this blood is distributed out through the body. Here are some little ducts, you see, in which the bile circulates. Here are the veins and arteries through which the blood circulates, and these are the little cells. These roundish white glistening bodies here are the liver cells, and although the liver does so many different kinds of things, the cells, so far as the microscope shos them, are pretty much all alike, practicaly all alike. You can not discover any difference in the cells. You would expect to separate out different kinds of sells there, but we can only find one kind of cells. There has been some reason lately, some recent suggestions have been made that there may be a second kind but that has not yet been fully confirmed.

Now, notice that these cells are located here right along a little duct. Here is a little duct, here is a blood vessel, and these little cells take the poisons out of the blood, pass the poisons over to the duct. The blood is traveling this way, and the bile is traveling this way; so the poisons are passed along into this sewer and are carried off this way, and so the process is carried on.

Now, in order that the liver should be able to do its work well, it is necessary that these little individual cells should be in perfect condition. There are various things which injure them. Suppose, for instance, one has been taking lead from the water pipes, water from lead pipes. Then these little cells get clogged with lead, and the whole liver is obstructed and can not do its work well. Suppose one takes an excessive amount of fat in the diet; the same thing has been observed, that these liver cells become filled with particles of fat so they are choked, unable to do their work properly. Now, suppose the person is in the habit of taking every little while a dose of blue mass or mercury

cury. The very same thing happens to the body. The mercury will be stored up in these little cells, and considerable quantities of mercury have been found in livers of persons who have taken large doses of mercury for a considerable len th of time. And the same thing is true of any other metallic poisons that one may be in the habit of taking. Here is a good reason why one should not indulge in the use of mineral waters, because iron, you see, and other substances from mineral waters are gradually stored up in the liver so the liver becomes obstructed and finally damaged. The liver has for its function to sort over and filter all the substances taken into the body. Everything absorbed from the intestine is filtered through the liver, and it is the duty of the liver to take out of the body or out of the blood everything that is of a poisonous nature; so when you find things accumulating in the liver, it is evidence that there are poisons there that we do not want. We should take a hint from this and keep them out, avoid taking them in. We find the same thing with reference to other things,--tea, coffee, alcohol, mustard, pepper, peppersauce, and ginger, and all those things are poisons which the liver must strain out; so they are work for the liver.

This is simply to give you something of an idea of the circlation of the blood through the portal circulation. You see the enormous vessels here that gather up--here is a better view of them; here is the intestine and here are the small vessels gradually growing into larger ones that gether up the material from the intestine, or dissolve the food, --the dissolved food, the digested food, and the undigested material, whatever sort it may be,--and carries it through this large vein, a branch of the portal vein, until it finally gets to the liver, and in the liver it is all sorted over, examined, and all the poisons, so far as possible, are taken out.

Now, a part of the work of the liver, as I was telling you a little while ago, is to prepare certain poisonous substances, a large amount of poison-

ous substances as material, in fact, to be eliminated from the body through the kidneys. The liver may sometimes be regarded as a closed door to keep poisons out, while the kidneys are an open door to let poisons out. The liver prevents the entrance of poisons so far as it can do it, and when it can not keep them all out, it prepares the substances so that they may be more readily eliminated by the kidneys.

Now, for example, one of the poisons taken up in the intestine is known as indol. Skatol is a relative of indol, and pyrrol is another substance. These three substances are the horrible, malodorous substances which are characteristic of intestinal excreta. Now, these substances when absorbed from the intestine are all passed through the liver, and in the liver they are converted into less poisonous substances,--indican, and indol-acetic acid. You see these things on the reports sometimes, and I am making these remarks so you will understand what they mean. The indican there in the intestine,--indo,--that horribly malodorous substance that comes from meat, ,--indican does not have this malodor--it loses its toxic properties at least to a considerable degree. This is one evidence of the beneficent work of the liver.

This represents a section of the kidney. It is this part of the kidney that does the work. This is made up of minute little tubes, and sacks, and blood vessels, as I will show you, in the next view; and the excretory substances are taken out of the blood, sent down there through little tubes into the blood vessels, in this large, central cavity, of the kidney called the pelvis of the kidney, and are thence carried off down through the ureter to the bladder, and so expelled from the body. T

This is the suprarenal capsule, which is placed above the kidney--a very curious little gland which was not understood until comparatively recently. It makes a substance known as adrenalin which when absorbed into the blood helps

to burn up the poisonous materials that are taken into the blood. The substances that escape destruction in the liver are destroyed in it, or utilized by the adrenalin which is formed by this large gland, the adrenals. These adrenals sometimes become affected by disease, become infected with tuberculous disease, undergo degeneration; then a person has what is known as Addison's disease. The skin becomes very bronzed like. That is ~~xxxxxxxx~~ only because the poisonous waste matters, Brenz catechin and other substances absorbed from the intestine, are no longer destroyed and burned up by the kidneys, but are left to accumulate in the body so the skin becomes very deadly in color, and a brownish coler, and the whole body becomes pigmented. We sometimes see people with dark circles around the eyes, and with brown spots upon the face and hands. I met a gentleman the other day that had brown spots ~~xxxxxxxxxx~~ as big as the end of my finger on his hands. I called his attention to them. "Yes, I know they are there; they have been coming there for a few years back", and the whole skin had a dingy hue. That is simply because these adrenals were not able to make adrenalin enough to destroy all the poisons which are left in the blood after the liver had acted upon the blood, and had not been able to remove as much as it ought to be. In other words, the liver had become crippled. The quantity of poisons was so great the liver had become crippled and allowed a great quantity of poisons to pass into the blood. For a time, the adrenalin produced by the adrenals had been able to destroy this poison, but after while the time came when they could not any longer deal with, and then there was the production of these brown colors in the skin. That is the whole trouble when your complexion gets muddy. If you have got liver spots, so called, you see the liver does have something to do with those spots; but it is simply because it can not destroy all the poisons that are poured in. The quantity becomes too great.

Now, this is a diagrammatic view of the secreting part of the kidney, the cortical portion, so-called, that I called your attention to a moment ago, that had the reddish tint in the dark outer portion of the kidney. It consists, you see, of a little group of blood-vessels here inside of the little sack, and this sack is connected with a tube which passes down into the interior of the kidney. There is an artery here, and veins, and you notice here a condition which is very peculiar, different from anything else to be found anywhere else in the body. In general, wherever there is an artery, there are two veins. The large artery comes down the arm here, for example, and a large vein on either side of it. There are two veins for every artery. And the veins have twice the capacity of the artery. But here this thing is reversed. Here the arteries have twice the capacity of the veins; you see the arteries here are large, and the veins are small. There is a reason for that. It is desired that in the arteries there shall be a pressure maintained, so great a pressure that the blood will not all be able to escape down these veins, but the watery portion of it shall ooze out, pass out, be filtered out and pass down this tube.

Now, this watery portion that passes out in this way contains chlorid of sodium, contains salt, and the chlorid of sodium passes along with the liquid, but is reabsorbed in large partalong the wall. Now, as liquid passes along, this fluid passes along down the wall here, there is a secretion poured out of urea, and the liquid portion washes away this urea and carries it down. The urea is formed along down the tube, butthe watery portion, the serum, passes out in this capsule called the Malpighian body of the kidney. This is a matter of considerable interest. People become dropsical sometimes, and the reason they become dropsical is because they can not get rid of salt. Salt accumulates in the body. This is because these little arteries here have

become hardened and shriveled up so that the kidney is not any longer able to pass the salt out as it ought to do. It is no longer able to eliminate the salt, so the salt accumulates. The body will not tolerate a solution of salt stronger than one part in 100, or 9 parts in 1000. So when a person takes in an ounce of salt and retains it in the body, the kidneys, not being able to eliminate the salt fast enough because they have become diseased, they must retain along with that ounce of salt, 100 ounces of water; in other wards, six pounds of water. So, for every ounce of salt that a person takes in and does not eliminate through the kidneys, he must retain six pounds of water with that ounce of salt. Now, when we remember that most people eat half an ounce to an ounce of salt a day, you can readily see that when a person's kidneys get diseased, he can get dropsy pretty fast. If he takes half an ounce of salt a day more than he eliminates, that wuld mean that man stored up three pounds of water in order to dissolve that salt. The blood will not retain more than just one part in 100, or 9 parts in 1000, so it pushes the salt out into the tissues, and a person drinks water, keeps drinking, drinking, and sends water along with the salt out into the tissues, because it can not get out.

The kidneys and the skin are the only sources through which you can get the salt out. So you see how important it is that a person who has kidney disease should get out the salt. Experiments made in France in the last five or six years have shown beyond any possibility of doubt that food always contains salt enough, that is, natural food. If we take food as Nature provides it for us, fruits and nuts and fresh, tender leaves like lettuce, etc., we get all the salt the body requires, and the use of salt beyond that is simply a matter of taste. We add a little salt to the potato ordinarily and it does not do any harm generally because it is eliminated, and it does not tax the kidneys very much to eliminate a small quantity of salt; but when you come to use large

quantities of salt, the kidneys are overtaxed, and by and by they are seriously injured, and the day comes when they are not able to eliminate salt, and the feet begin to swell, and the eyelids begin to feel puffy in the morning, and we have evidence of autointoxication or dropsy. In many cases, of the autointoxication, the same condition prevails, because a person who has had a coated tongue for years and has had autointoxication for a long time, if he has had a coated tongue had he has had autointoxication; they are practically synonymous; every person with a coated tongue has autointoxication. That is why he has a coated tongue. He has lost his power to destroy germs and keep the mouth clean, and free from bacteria. And that is because the blood has deteriorated. I will show you about that in a few moments. So you see it is important we should take good care of the liver, in order that the kidneys should not be overworked. If the liver fails to eliminate all the poisons or to eliminate all it ought to eliminate, and if the kidneys have more poisons to deal with than they ought to, and these poisons pass through the kidney, irritate the kidney, by and by produce sclerosis or hardening of the kidney and the closing up of these blood vessels, so the kiver and kidneys are no longer able to do their work, then comes Bright's disease. Bright's disease begins in the liver; it begins in the colon really, in the intestine. There is where the poisons are generated. Then the liver breaks down, can not do its work properly; then the kidneys are overwhelmed, then the symptoms of Bright's disease begin to make their appearance; and when the doctor says you are getting Bright's disease, then it is too late; it is too late; the situation is just the same as that of a house in which a fire began in the basement and has worked all the way up through the house, and by and by the flames burst out through the roof, and the neighbors come in shouting, "Your house is afire",--why, that house is gutted; the fire has burned from the basement clear out through the roof, and it is too late to save that house; you

can put the fire out, but it is nothing but a poor, ruined, shell of a house; and that is the situation when a person discovers by defects of the kidneys, albumin, casts, etc., discovers that he has got Bright's disease; he has got a ruined body. There is absolutely no recovery for him. There is no hope for him other than to enable him to eke out a few more years of life by taking extraordinary care of himself. The thing is to take precautions in advance, to find out before hand the mischief that may be done, and is being done, and stop before the whole house is destroyed.

Now, this is a view of the white blood cells. These are normal white blood cells. They have different forms. They change their form. They do not have these forms all the while. This one is putting out a foot, you see; this one has got a longer foot. "ere is one that is quiet, and these others are resting; but they have different characters, as you see from their different appearances here; there are a number of different kinds of white blood cells. They are the defenders of the body. These white blood cells capture germs, and actuall y destroy them. When malarial parasites are put into our blood by means of mosquitoes, a mosquito comes along and vaccinates us with malaria, injects some into the blood, they grow rapidly there, and these white cells pursue them and to get away from the white cells they take refuge in the red cells, to escape from the white cells apparently; but the white cellspursue them. Now, when we have a sufficient number of these white cells, they are able to capture the malarial parasites, and to destroy them; but if we haven't enough them, or if they are half dead, they are inactive, then malarial parasites have an opportunity to grow ad libitum, and they overwhelm us.

This shows some of the white cells in the act of capturing germs. Here are red cells, and here are white cells. The red cells march down through the center of the vessels, carrying oxygen in, and carbonic acid gas

out. But the white cells linger along the wall, creep along the wall slowly. If some germs get into the tissues outside the blood vessels, these white cells pile up, stop opposite the germs, then begin to bore little holes through the wall. Each cell makes a hole through and creeps through just as you would tuck a pocket handkerchief through a ring, and they pursue the germs, go right straight for the germ. When this one gets through, it will go right straight after a germ, and won't go around hunting for it, but it will go right straight to it. This one came through up here, and went right straight to that germ, and caught it. They never make a mistake. Having no eyes and no noses, no organs of sense of any sort, merely little drops of living jelly, transparent water, apparently no structure at all, yet these wonderful white cells move right straight toward the germ and capture it every time. It is a wonderful illustration, my friends, of the marvelous intelligence that dwels in the body, and rules all the minute processes of the body. It is occurring to us every moment, caring for us every moment, for the minutest processes that are going on within us.

Now, this is the normal work of the white cells to capture germs. There are millions and billions of these germs that are swarming into us every day. They are swarming on the skin which is covered with them. They are working in continually, billions of them, and these cells are standing there on guard, sentries that are capturing them as fast as they come. So in the intestine, they are swarming in in billions, vast multitudes, and from the intestine into the blood continually, especially after meals, after eating, because they are taken in large quantity, taken in much more rapidly after meals than before. So if we examine the blood after dinner, you will find that there are a great many more of these white cells out. They come out in force just as firemen come out when the fire bel; rings. So when the dinner bell rings, we may say, the white

blood cells come swarming out to take care of the germs that come in in connection with the process of digestion.

Well, these wonderful white cells, you see, are highly important for us, then. They are of the greatest possible importance to preserve our lives. When we suffer from typhoid fever, tuberculosis, or any other infectious disease, we depend absolutely upon the activity of these wonderful cells. They increase sometimes several times, although the body contains some twenty thousand million million of cells all the time, and one out of every 700 of them is a white cell, although the number is so vast, those numbers will multiply by two, three, four, five, even ten times--they may increase up to ten times their ordinary number within twenty-four hours, created on the spot to help us if pneumonia or some other infectious disease has attacked us.

Now, I want to call your attention to another interesting thing here, the relation of the liver to blood pressure. This represents the general vascular system. Here are the arteries represented by a tank, if you please. We will call it a closed tank, a closed steel tank without any opening except small tubes that lead out of it, and there is a little valve on each one of those tubes that can be partly opened and closed, that can be regulated. Here is the heart, the pump--the left heart. We will suppose the water is pumped up into this tank, and of course, the harder the pump works, the more pressure there will be up here. The smaller the openings, the more the water will accumulate, and the higher the pressure will be. If these openings are large, then there would not be very much pressure. That is, if they are large enough to let the water out as fast as it ran in, there would not be any pressure at all; but if the openings are small enough, the water will accumulate and there will be pressure in the tank. That is why we have blood pressure. The heart pumps hard enough to keep the arteries full of blood up to a certain pressure, so when you cut

you cut an artery the blood spurts out. That is the reason why the blood does spurt--because there is pressure within, and each contraction of the heart, or each stroke of the pump, the pressure is raised, and the blood is forced out. There is pressure enough to raise the blood to aboue seven feet high in a tube. If we connect the tube with an artery, the blood will raise up six or seven feet; and that is the amount of blood pressure we have in our arteries. This pressure can be measured byputting an instrument on the arm then compressing an artery ~~xix~~ until the pulse ceases. Then, if we let the pressure off and notice the amount of pressure registered just as the pulse begins again, then we know just how much pressure there is in the arteries. That is the way we measure the blood pressure.

Now, the blood pressure ought to be about 105 millimeters, 95 to 105 millimeters. Twenty-five millimeters is an inch, so you see about four inches of mercury is about 100 millimeters. Mercury is much heavier than water, and it would be about seven feet of water to represent the pressure in the veins. Now, the veins are so strong; that is, this tank is so strong in the body that it is able to resist fifty times the pressure which is ordinarily brought to bear upon it. Fifty times the ordinary pressure, required to circulate the blood, is made here. Now, these other tanks represent, if you please, reservoirs, venous reservoirs. Here are the muscles. The muscles have vessels large enough to hold half of all the blood in the body. The skin has bloo d vessels large enough to hold two thirds of all the blood in the body; but in the abdomen, there are large veins capable of holding all the blood in the body. Now, notice the difference courses of the blood.

The blood comes through the muscles, comes back through the large veins to the right heart, then up to the lungs to be purified, then comes back to the left heart to be distributed again. The blood from the skin comes back to this

vena cava, ascending and descending, to the right side of the heart, then to the lungs to be purified, then to the left heart, then to the general system again, is redistributed. But this blood which goes to the large vessels of the abdomen, the blood which flows to the stomach, liver, spleen, pancreas, intestines, and the lymphatic glands of the abdomen, all that blood goes through a filter; instead of going into the general circulation--just a little of it slips through here, but most of it passes through the liver before it gets into the general circulation. That gives the livery an opportunity to act as a filter, don't you see,--to take up all the blood that is saturated with the products of absorption, of digestion of food; we absorb the water we drink, or the alcohol, tea, coffee, beer, and all the other things we swallow, and the nicotin poisons, the saliva poisons we take in along with our food, of all sorts,--mustard, pepper, peppersauce, ginger,--poisons that are found in decomposing meat of various sorts--and meat is always more or less decomposing when we eat it,--these poisons that are carried through the liver, and they are all carried through the liver, you see.

Now, you see, if these poisons are too great in quantity, if the effect is to cause the liver to become diseased, change the liver so it becomes hardened, the blood vessels shrivel up so the blood can not get through; then dropsy accumulates, causing bloating. The blood can not get through the liver, so the serum oozes out into the abdominal cavity, and it fills up with liquid, and a person has dropsy.

Now, we shall see some more interesting facts about this. This represents an experiment I saw in Pawlow's laboratory in St. Petersburg, three years ago last spring. I just received a letter today from my friend, Prof. Benedict, of the Carnegie Institute, in Boston, the nutrition laboratory, not the institute, but the laboratory,--a branch of the institute; and he has just retu

returned from Prof. Pawlow's laboratory where he has been spending the summer, and he gave an interesting account of his experiences there, and he happened to be with Pawlow the same day I was there over three years ago.

This is one of the experiments made in the laboratory. This is the portal vein. This vein carries blood from the heart to the lungs. This is th the vein that carries blood from the liver into the general system. This vein is tied, you see; the portal vein is tied so the blood which is absorbed from the stomach and intestines and the other organs connected with the portal circulation,--this blood, instead of going through the liver to be filtered out, goes at once into the general circulation. Now, there was a dog had this operation performed upon it. This is what is known as Eck's fistula; and this operation had been performed. After the operation had been performed, Prof. Pawlow's assistant said to me, "Now, we must be very careful what we feed this dog. We must never feed him any meat. We must feed him on a diet of bread and milk. He must never have any meat, because if he has meat he will die in three days." That experiment has been tried many times, and a dog that has had this operation performed, so that the liver is cut out,--not removed from the body, but is cut out so that it no longer acts as a filter--all the other functions are still performed, but its filtering function, its poison-destroying function is paralyzed, because the blood no longer circulates through it--that is, the portal blood. The nutrient blood still circulates through it. This has been found to be true in every case, when that dog is fed upon meat he dies; and the reason why he dies, is because he does not have the beneficent work of his liver to destroy the poisons which result from the decomposition of meat, the presence of meat in the intestine.

Here are some of the crystals that are frequently found in the blood sometimes. A part of the duty of the liver is to destry these crystalline substances. It is a part of its duty, and when it is paralyzed by overwork,

it can not do this work, then these crystals form in the urine--uric acid crystals, stones are formed in the kidney, and I had a case just a short time ago in which the X ray showed stone in the kidney. The patient had suffered for years with a most terrible pain in the kidney. In opening up the kidney, I found a large stone as large as the end of my thumb had been moving around in the kidney and producing the most terrible pain, because the liver had failed to do its duty; so these crystallizable substances were passed into the liver in too great quantity, and had been deposited in the kidney forming a stone. If these stones are small, they may find their way down into the bladder, and then begins the formation of a bladder stone. I have removed bladder stones nearly as large as my fist that had been formed in this way as a result of the failure of the liver to do its entire work.

Now, this represents the normal liver. This is the large part and this the small part. The liver weighs about 3½ pounds. The left lobe reaches pretty well over on the left side. This left lobe has nearly disappeared. This right lobe has a lobulated appearance, because of shrinking; the liver is cirrhotic; its tissues shrink, harden, so it is thrown into this lobulated appearance.

This is another form of drunkard's liver--hobnailed liver. These masses are so large they can be felt through the abdominal wall. You can feel these nodules along the edge of the drunkard's liver. Now, I must tell you the real truth about it,--it is not realy the drunkard's liver; and the so-called gin liver is not properly a gin liver. This is a dyspeptic liver; for it is found by experiments of Voix, of Paris, that this kind of liver is found more often in people who have made use of pepper, mustard, peppersauce, and vinegar in large quantities than as the result of the use of alcohol. Prof. Voix experimented upon rabbits, guinea-pigs and dogs, and he administered pepper and mus-

tard, and capsicum, vinegar, and other substances, and he found pepper had six times the power of gin to produce gin liver,--six times the power of vinegar. It had double the power of alcohol to produce gin liver. This is one of the most important facts that has been b rought out in recent times, because it confirmed the observation made by hygienists for so many years that these things are unwholesome and tend to produce destruction of the finer structures of the body.

Now, the way in which they produce this malformation of the liver is by causing an irritation of the liver. Whenever there is an irritation there is a hardening. If you put something into your eye that irritated it, the eyelids wd would become so thickened that by and by the eye would roll out, the inner surfaces of the lids would begin to show, and the lids would have red edges. That would be the natural appearance. The nose, when it is irritated by the use of snuff or any means, the mucous membrane gradually becomes thickened, until by and by the nose is obstructed. The same thing happens here. The framework of the liver which is made up of fibrous material when it is irritated, grows and becomes thickened, and the contraction of this thickened tissue, which looks like a cicatrix, like a scar,--this contraction gradually destroys the liver by compression of its connective tissue, of its active, secreting, poison-destroying cells; they are compressed, pinched until they are by and by destroyed entirely, so the liver loses its functional activity.

Here is a healthy liver, here is a section of a nutmeg liver; here is a cirrhotic liver; here is an inflamed liver; here is a portion of a fatty liver with fat particles all through it; here is a hobnailed liver; here is a section of a cancerous liver. When the liver becomes crippled and diseased in this way, then it becomes subject to cancer xxxxx and other maladies.

Here is the pancreas which lies behind the liver. This degenerative function affects also the pancreas. It is less than two weeks I think since I

performed an operation upon a man who suffered terrible pain, and I found this pancreas was as hard as a piece of wood, covered with nodules such as I showed you with the liver, and the whole pancreas was in this condition,--unfortunately a hopeless case; nothing can be done, because the pancreas can not be removed.

Here you see the kidneys which are ruined, destroyed. Here is a healthy kidney. You see its size is about the normal; here is the big white kidney of the beer drinker. The normal kidney structure has given place to fatty structures, and the kidney is practicallyinert. A man can get along with one kidney, can possibly live with two thirds of a kidney, but less than that is insufficient to remove the poisons which accumulate in the blood and destroy life. Thishis a congested kidney, and here is a cirrhotic kidney. These different forms of kidney are the result of overwork. They are the result of failure of the liver to do its work, and finally the kidneys become worn out, by having to do an extra amount of work in the elimination of poisons which have not been properly prepared.

Now, here are some figures I want to invite your attention to for just a moment, because I think they are of most tremendous importance. These figures indicate the quantity of poisons which are removed by the kidneys, poisons which have been acted upon by the liver, so the ~~kixax is~~ poisons are prepared form elimination by the kidneys. Prof. Folin is recognized as one of the greatest authorities in the United States, perhaps in the world, on the secretions of physiologic chemistry. He is the distinguished professor of physiologic chemistry at Harvard University. I have the pleasure of knowing him, and I think I am perfectly safe in saying that there is no man whose authority is more respected than Prof. Folin's. He is a man of great learning and exceedingly great accuracy in all his statements of fact. This first column represents figures given by Prof. Folin as the amount of poisons eliminated by kidneys of the average person. The quantity

of urine is 1430. That means practically three pints. The amount of acid is 2, you see, and so on. This column represents the amount of poisons that are found in our own laboratory, using the same methods which Prof. Folin employes, in making the analyses,--the average in a large number of persons living upon a low protein diet; that is, upon a diet which is based upon Prof. Chittenden's experiments, which, as you all know, were instigated by Dr. Horace Fletcher. Dr. Fletcher induced Prof. Chittenden to take up the experiments which laid the foundation for the wonderful reform which is going on all over the world now in reducing the amount of protein in the dietary as being applied to animals as well as to men and is unquestionably the most important movement in diet reform that has ever been instigated, that has ever ~~axixtad~~ been set going. I consider it the most important thing that has occured in my history, in my recollection, and I don't know anything in the history of nutrition that is so important as this question of the reduction of the amount of protein.

Now, I had studies made on a large number of persons, and had experts working for several months in our laboratories here for the purpose of getting at these figures with all the accuracy possible, verified again and again and again; and I want you to compare these figures.

First, quantity. You see the quantity is two thirds as much--1000 instead of 1400. Now, there is a good reason why the quantity is less--because the amount of poisons is proportionately less. The amount of acid you see is .9 instead of ~~&~~x two; less than half the amount of acid. Now, you come to the total nitrogen, which represents the total amount of poisons, waste substances; that is, the urea, and uric acid, and other poisonous substances, the real waste substances which the kidney is chiefly occupied in eliminating. This is represented by sixteen in the average person, according to Prof. Foline, but only $6\frac{1}{2}$ in the person living upon the low protein diet. You see it is just a little

more than one third as much. See what an important thing. The kidneys of the man living upon the low protein diet have only one third as much work to do in eliminating waste nitrogen as the man living upon the ordinary diet. Now, when we come to urea, this substance which is eliminated in largest quantity by the kidneys is practically 30 in the average individual, and only a little more than one third as much, only 11.6, about one third as much in persons taking the ordinary low protein diet.

Now, I should say that the persons who were made the subjects of this experiment were not patients. We tested our employes who were working hard, our nurses and laboring persons, medical students, people who were engaged in hard manual labor, active work every day, and these persons who eliminated these quantities were not as active as our individuals were, and they--most of them, in fact, were patients of an insane asylum whose minds were more or less disturbed and did not live a very active life, so you see that is a point in favor. Another point in favor of the low protein dietary.

Now, when we come to uric acid, it is about the same. I think these figures must be too small. When we come to ammonia, there is four times as much in the average individual. Ammonia is one of the most virulent substances found in the urine. It is formed for the purpose of neutralizing this acid, and there is twice as much acid in the average individual as in the low protein individual, and the amount of ammonia is nearly four times as great.

Here we have creatin that is produced as the result of muscular work, and is practically the same; there isn't much difference. The salt, chlorid of sodium, is twice as much; more salt was eaten. That is not a matter of any great consequence. Phosphates which are the result of nerve waste, wear and tear, and are derived also from meat. You see the amount is about three times as great. The sulphates which result from the putrefaction which goes on in the intest

intestine, and from the waste substances and from meats,--you see these substances are three times as great. Now, sulphur--twice as much in the urine of the average person as in the person living on the low protein diet. These ethereal sulphates are entirely a product of putrefaction, and are three times asgreat. Total sulphur is three times as great in the average person as in a person on the low protein diet. And when we come to indican, you see in persons living upon the ordinary diet, eating more or less meat, 77, and less than six in the person living upon the low protein diet; about thirteen times as much indican which is the product of putrefaction in the intestine. But all through you can see that the kidneys of a person living upon a low protein diet have practically only about one third as much work to do in the elimination of poisons as the average individual has. Now, this means that the liver has only one third as much work to do as well as the kidneys; and the other poison-destroying glands in the body have only one third as much work to do.

Now, when you reflect that old age is the result of the accumulation of poisons in the body--that is why we get old--simply because our livers, and kidneys lose the power to destroy and eliminate poisons sufficiently rapidly to keep the tissues intact. Buchard said that every man is a factory of poisons; every human body is a factory of poisons. That is true of every animal; and so long as we can eliminate these poisons; so long as the draught is good enough to carry the smoke out so the air in the house remains clean and pure, then our tissues can live and perform their functions; but when poisons accumulate in the body, then the arteries begin to harden and the liver begins to harden, and the kidneys begin to harden, and the brain to lose its activity, and the whole body begins to fall into decline.

I want to call your attention to a few points here,--some experiments to show the difference in readiness with which various food substances undergo

putrefaction. These foods were in equivalent quantity, and to each quantity was added a small amount of fecal matter so that there was a known quantity of germs; then it was put in a warm place for three days, and the poison formed was measured by distillation and careful estimation, and this is the result. You see beef up to 7, smoked herring up as high as 17, and lean mutton. Here are milk products. See the difference. Two or three was the very highest in the case of cheese. Yogurt cheese was one tenth. Boiled milk was five. The average was one. Note the difference here. See the mutton, beef,--13 and 17. And vegetable foods, .05. You see only one twentieth part as much as the average of milk; and compared with meat, see the difference. The mutton 17; cereals .05,--one twentieth of one. The meat makes 340x ~~ixxhxx~~ a times as much poison as is found in the cereals, and you see this is practically the same right straight through. In vegetables the average was .18, or less than one fifth of one, or about one one hundredth part as much as was found in the meat. So you see on the vegetable diet the amount of poisons produced was enormously decreased; but on the meat diet, these poisons produced by decomposition in the intestine are enormously increased; and the natural result of the flooding of the body with these poisons is to weaken the body, to lessen its power of endurance; and Prof. Fisher made some experiments some years ago to test this, and this little table shows the result of it. I will simply call your attention to the fact that fifteen of our men here in holding the arms out made an aggregate of 336 minutes, while fifteen of the athletes of Yale, selected men, strong men all in training for intercollegiate ~~xx~~ contests, were able to hold their arms out only 150 minutes,--all of them together. The aggregate of what the Yale athletes were able to do was 150 minutes, while the aggregate of fifteen of our nurses and doctors, including all the doctors down the line here, including Dr. Riley, one of our more elderly men, and another doctor who was fifty years old

old, over fifty years of age, a laboratory man,--these men together held their arms out 336 minutes. The maximum of the high protein men was 22 minuted. There was not a single athlete at Yale able to hold his arms out more than 22 minutes. One of our men, a low protein man for many years, held his arms out three hours and 20 minutes, and could have gone on for half an hour more, but he found he had gone so far beyond anybody else he thought it was not worth while; so he stopped.

Now, the average of these meat eating men was ten minutes. Yale athletes made an average of only ten minutes. The average of our young men here, 38 of them, was 49 minutes, and nearly all of them could have donea great deal more, but the first of them thought that twenty minutes, and thirty minutes was such an enormous time that it was enough; so the time gradually grew, as they went on with the experiment. The same thing was practically true of other experiments. We haven't time to consider them all tonight.

I just want to call your attention to these facts, and particularly to this table here which shows the number of bacteria found in meat as it is bought in the shops and eaten, and I may say the boiling and cooking of meat does not destroy all the germs. It kills a few of them, but does not destroy them all. For instance, here is a large sausage,--12 billion germs in an ounce. A billion is a pretty good large number. Twelve billion germs in one ounce of sausage. A small sausage had nearly twenty billions; round steak 17 billions, roast steak 17 billions; and all of these when left in a warm room, the number of germs increased enormously. Hamburger steak had three billion 870 millions when we got it, but after twenty hours it had 51 billion. Porterhouse steak had less than one billion, but had twenty-one billion by the next day. Here is sirloin steak, and tenderloin steak which was cooked, well done, had almost a billion germs in it, and the tenderloin cooked rare had five billion in

in it. You can not cook them enough unless you cook them hard and dry them until they are actually dried hard, so as to destroy the germs; and then there are some spores there that are not killed yet. It has to be cook half an hour at a temperature of 240° in order to destroy the germs. Now, this is not exceptional. This is true of all meat. I should say that this meat was obtained some of it from the butcher shop, and some ~~it~~ of it from the leading hotel in the city. Our bacteriologist asked the chef of the Post Tavern to simply send him up some of the food as it is served on the table, just as he served; and it was brought up to us just as it went on the table. The same meat that was served on the table was brought up here and examined and found to have this amount of bacteria. I don't say this as in any way reflecting upon the Post Tavern, because the meat obtained there is just as good as you can obtain anywhere. It is the way in which meat comes to every hotel table in the land.

I would like to call your attention to just a few things that will show what poisons do to the blood. Here is the blood damaged by poisons absorbed from the intestine--autointoxication, so they have lost their power to destroy. Here are some more of these damaged white blood-cells which have lost their power to destroy germs, which are swarming into the blood continually; and when this condition goes on, after while certain of these blood cells actually prey ~~appear~~ upon the body. The so-called phagocytes or macrophags climb up into the hair and carry off the coloring matter. That is the way the hair becomes gray, instead of attacking germs and destroying germs, when the body is deteriorated by the action of these poisons, the white cells attack the body itself, and one of the first symptoms of it is the effect upon the hair. And they also attack the kidneys. That is the way the kidneys degenerate. That is the way the poisons effect the body,--in causing degeneration,--is to so injure the tissues that the white cells attack the tissues themselves; and here they are shown by

Metchnikoff attacking one of these little tubes in the kidney; and this shows some of these cells attacking the nerve cell of the brain. This woman was an old lady one hundred years old, and this shows the cells attacking the brain. That is what destroys the memory in the old person, and produces a senile condition. And these same cells attack the heart and the blood vessels of the heart, and that is what produces angina pectoris; that is what produces degeneration of the heart, fatty degeneration and other forms of weakness of the heart, as well as degenerations of the blood vessels.

Permit me to call your attention to the fact that there is published monthly in this vicinity a journal, called GOOD HEALTH, the purpose of which is to show you and everybody else who will read it how to keep in good health. The facts I have been telling you about here tonight are discussed in the monthly columns of this journal. We are very proud to have Mr. Horace Fletcher as collaborating editor, contributing editor, and you will find something from his pen very often in the monthly numbers.

I thank you for your patient attention.

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