

SOME NEW IDEAS ABOUT DIGESTION.

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

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By,

J. H. Kellogg, M. D.

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Prior to ten years ago we really knew very little about the subject of digestion. It is only since the publication of the results of researches and experiments made by Pawlow, the great St. Petersburg physiologist, that we have understood what digestion really is. Pawlow has discovered more than all that was known before about the processes of digestion. I am going to tell you something about these discoveries tonight, and you will be greatly interested in knowing some of Prof. Pawlow's discoveries; and here is the man himself, or at any rate his shadow. I have the pleasure of knowing Prof. Pawlow. Four years ago I spent some weeks in his laboratory. He very kindly turned his laboratory over to me when he found me interested in his work, and instructed his assistants each day to make any experiments I wanted them to make, and to repeat for me the experiments which have made him world famous, and which have thrown so much light upon the subject of digestion. I came to know Prof. Pawlow quite well, and was entertained in his home; his wife is a most charming woman, and he himself is one of the most ~~xxxxx~~ delightful of men. He is a man about sixty years of age. He received a few years ago the Nobel prize. You know that is a prize of fifty thousand dollars given every year to somebody who has made the greatest discoveries, or the greatest advancement in special lines. Mrs. Pawlow told me that her husband had very little property, very little money; that he was not

worldly wise. She said he was not a good business man, and the fifty thousand dollars he received was about all he has in the world; that was the compensation for his life effort, for his salary from the Russian government is ~~xxxx~~ barely enough to support him, just barely enough to support him. Mrs. Pawlow said that her husband is simply a big boy who loves his laboratory and he loves his work, and he cares nothing for money at all; he is simply a good boy.

Now, this is one of his experiments. You can not tell very much by the looks of that diagram ~~xxxx~~ which looks very different from the thing itself, what the experiment really is. Now, this dog has had two operations performed upon him. One operation was to connect the stomach with the skin, so that the secretions accumulating in the stomach could be collected. And the other is an operation by which the esophagus is interrupted so that instead of passing straight from the mouth to the stomach, it ends in the skin of the throat, and leaving another passage from the skin into the stomach. Now, Prof. Pawlow found very early in his experiments that many of the old observations made upon the stomach were entirely wrong. It was formerly supposed that when food was taken into the stomach, no secretion occurred until some time after the food had been in the stomach, until perhaps a half an hour or more after food entered the stomach and before the secretion of gastric juice began. He found that instead of this being true, that the secretion of gastric juice begins before food enters the stomach even; even before food has entered the mouth; and that is why this experiment was performed. The esophagus was interrupted so that food taken by the dog into his mouth passed out into the dish in which he ate it instead of going into the stomach; so the dog would chew the food and it would pass back into the dish; he would soon chew it over again, and the dog would continue chewing in this way for hours. Because, no food entering the stomach, his appetite is increasing all the while. He does not get tired of eating. In other words,

he enjoys it more the longer he eats. If the dog had been eating four or five hours, he is still hungry as ever; his appetite is keen as ever. I suppose some of you possibly may be envying that dog. You think you would enjoy an breakfast four hours long, and enjoy the last morsel more than you did the first. This is more convenient, at any rate, than the practice in the time of old Nero. Some of you doubtless have visited the ruins of Nero's palace in Rome, and will remember the banquet room, and down at one corner a doorway with the inscription over it, "Vomitorium." It is reported that these old gourmards used to eat as much as they could then retire to a little room adjacent to relieve their stomachs, then return to the banquet and resume their gluttonous feasts, and so continued hour after hour.

But Pawlow's method with the dog is very much more convenient; he does not have to take an emetic or use a feather to tickle his throat as these old gluttons did. Pawlow noticed that when this dog had been chewing a few moments, four or five minutes, that the gastric juice began to pour down into this tube, and trickle into this flask. This is what he called appetite juice. While the food was still in the pan, and before it ever had entered the stomach, the gastric juice was pouring out freely into the stomach; and it was found that this so-called appetite juice was very powerful gastric juice, had very powerful digestive properties, was indeed the most powerful gastric juice that is formed at all, is this that is formed before the food enters the stomach. Pawlow observed that the stimulation of the nerves of taste is all that is really required to produce this outflow of gastric juice. Some of you perhaps have noticed on the back of the tongue some large papillae that stick up quite prominently above the others. There are twenty or thirty of these papillae known as the papillae circumvallate. I remember some time ago a lady made the sudden discovery that she had these large papillae at the back of the tongue. She thought it was some cancer, or something awful, growing there. They are natural growths upon the

tongue. And you can readily see why they are called circumvallate. This is a single papilla, and this is a furrow which surrounds the papilla. This represents a section, you see, through the thickness of a vertical section, through the papilla, and here is a little trough around it. Now, the purpose of this trough is to receive the fluids of the mouth which contain in solution the sapid substances of the foodstuffs. ~~xxxxx~~ This liquid runs down into this little trough, and here alongside of the trough are these wonderful taste buds each one of which is an expanded end of a bunch of nerves. Here is the nerve behind it that runs up into the brain, and in this little bud here are thousands upon thousands of delicate nerve filaments which under this arrangement, as you see, come right out to the surface, project right out, they come right out through the mucous membrane so that they come right into contact with the juices which are present in the mouth and which contain the substances which have the property of flavor, which have flavors of some sort. Now, you do not find these taste buds projecting out from the surface of the tongue, because they would be very quickly torn off, you see, by contact. These delicate, jellylike masses are extremely sensitive; these substances if they projected upon the surfaces of the tongue would be very quickly torn off, but they are hidden away down in this little groove in which the fluids settle from the mouth, and these taste buds can there be exposed right upon the surface so that they can come in contact with the food substances which ~~xxxx~~ may enter into solution.

Now, Prof. Pawlow showed that when food is taken into the mouth and is ~~chewed~~ so that the properties can be detected and tested by these taste buds, that messages are sent along these nerve trunks up into the brain, and the message tells the brain what sort of substance this is in the mouth, and what is needed. If, for example, dry substances are taken into the mouth, then the message sent to the brain is that saliva is needed, that liquid is needed, and

a large amount of liquid saliva is poured out into the mouth to dissolve, if possible, this dry substance, or to render this dry substance~~xx~~ moist so that it may be swallowed and carried down the throat. If saccharin or bitter substances are taken into the mouth, ~~xxx~~^{or} acid substances, they also cause a very abundant outflow of the saliva. When starchy substances are taken into the mouth, the saliva is poured out in greater abundance for the purpose of digesting this starch.

One of the very remarkable things observed by Prof. Pawlow was that it was not even necessary that the food should be put into the mouth in order that these reflex nerve actions, these signalling actions to the brain and to the stomach should take place; he found for example, that when a substance like meat powder was brought near to the dog's nose so that he could smell it, immediately the saliva would begin to pour out of his mouth, within a very few seconds, and within two or three minutes the saliva and the gastric juice would begin to pour out of the stomach also. He found even that the presence of the keeper was sufficient to cause the dog's mouth to salivate, his mouth to water, and the gastric juice to flow from the stomach. When the man who usually fed the dog passed through the room when it was near feeding time, at once the gastric juice would begin to pour from his stomach, and the appetite juice was being developed. This is the same thing that happens to you and me when we come into proximity with a good dinner, when we are hungry. We see something that has a pleasant flavor. A little girl was telling me this morning at the table that at public school the teacher said, talking about digestion, "you know, when you go to the meat market and you see a nice liver hanging up there upon the wall, it makes your mouth water; you would like a piece of it." She said, "I told the teacher it wasn't true; that a sight of a liver or a dead animal did not make my mouth water at all", but the teacher said, "It does mine", and

most of the children said, "and mine too." But it depends, you see, entirely upon the appetite. So Pawlow observed that when the dog was offered something which he did not like that it did not cause a flow of saliva, it did not cause the gastric juice to pour out; but it must be something the dog was fond of. One dog was very fond of bread, and when he saw bread, the saliva would pour from his mouth, and the gastric juice would pour from his stomach, and when he saw meat, he paid no attention to it; there was no saliva and no gastric juice. Another dog's stomach was stimulated by meat, and produced gastric juice by the mere sight of the meat, or the smell of it. The experiments of Prof. Pawlow that he very kindly showed me one morning when I was in his laboratory, show that music has the effect to stimulate the flow of saliva and of digestive fluids. A dog that was very intelligent and sensitive was confined in a room all by himself, and his keeper was with him, and we entered the room. Everything was still, all quiet, and the dog was standing there with a little tube attached to a duct from his salivary gland, and a little bottle connected and everything absolutely still. Suddenly the keeper moved a little lever with his foot, ~~and~~ a movement absolutely imperceptible, a very slight movement of the foot moved a lever and released an air current somewhere in the room which produced a very high note, a note that seemed to me to be about the highest note you ever hear from a pipe organ, a very high, shrill note. ~~Withixfix~~ Within five seconds the saliva began to trickle down from the dog's mouth; within ten or fifteen seconds a regular stream of saliva was pouring down as the result of the stimulation of this musical note. That is one of Prof. Pawlow's discoveries. That is the reason why we have music for dinner,--because we hope it may have some influence to charm away the dyspeptic demons that are haunting about.

Here is a little gland that secretes mucus, that pours it into the mouth to help keep it clean and sterile, to prevent germs from growing there.

What a wonderfully interesting thing the tongue is, isn't it? Think of it--thirty or forty of these little sentinels placed at the back of the tongue, each one of them inspecting the food, each one of them making a careful examination of every morsel we eat, and after it has been examined, telephoning to the brain what kind of food is coming, and the brain then telephoning to the stomach to prepare for the food that is coming, so that by the time the food gets into the stomach, if we take time to chew it properly, the stomach has the gastric juice already there to digest it; it receives its food with open arms, so to speak; the stomach is all ready. So you see when the mouth waters, the stomach waters; and one lesson we get from this is highly important--the food should be palatable. Sometimes it is just as important that it should not be particularly palatable. For example, suppose your stomach makes too much gastric juice; suppose you are suffering from hyperacidity, you may draw at once the inference it would be a good thing to eat bland food, food that does not stimulate the nerves of taste, and that does not stimulate these papillae of the tongue very strongly, that leaves the stomach to itself pretty much, so that the stomach shall not be overstimulated. A person whose stomach makes too much gastric juice does not have to be stimulated. Some stomachs continually pour out a stream of gastric juice, day and night, whether food is there or not; and certainly we do not need to encourage that sort of stomach.

This shows some of the dogs. These dogs get up early in the morning, at six o'clock in the morning, and from six o'clock until ten o'clock every morning, for far hours, they do nothing but chew, chew. Food is put into these pans and they chew, chew, chew; every dog has a little tube that goes into a flask, and the flask collects the gastric juices, which afterward passes through a filter, and it is purified, aerated, and it is shipped all over Europe and even to the United States; and we have got some of it in our pharmacy, of this

canine gastric juice to help people who can not make any gastric juice of their own. Each dog makes a quart of gastric juice every morning before breakfast; that is his day's stint; that is the way he earns his ~~xxxx~~ board. Then, when his time to eat has come, after he has produced his quart of gastric juice, there is a little opening in his throat there, through which a little stomach tube is passed, and his breakfast is introduced to the stomach, and he never tastes his real breakfast at all; he only tastes the breakfast he does not eat. It is a curious thing. He is given a large amount of meat and other things that he chews, but when it comes to feeding him, he ~~gax~~ is fed on oatmeal. I was particularly interested in that; the dog was fed oatmeal porridge, after while, through a tube; but the thing he chews and has a good time with, is meat chops of various sorts.

Here are some of the dogs, you see, and they are very intelligent and very healthy looking dogs. They seem to enjoy perfect health. Here is a little opening through which the tube is introduced, and the food is discharged. Taken into the mouth it slips out through that little opening, and none of it ever gets into the stomach. They are healthy, hearty looking dogs, and they enjoy life apparently as much as any dogs you ever saw; and they were always glad to see the keepers. I was interested in noticing that Prof. Pawlow was particularly popular among his dogs. They seemed to know the master had come, and whenever he appeared, every dog sat up and gave attention at once, wagged his tail to say good morning to him.

Here are the keepers. The dogs are well cared for, and have a great deal of attention given to them.

So we know some things now about digestion that we did not know before. For example, it has been found that the digestive work is done almost entirely in this part of the stomach. The food is received here, passes down the esophagus,

passes right into the center, then gradually works out through the outside, so when there is a large mass of food in the stomach, the central part of the mass is that which was last received. The outside of the mass comes in contact with the mucous membrane and with the gastric juice, while the inside of the food mass is still in contact with nothing but the saliva. The salivary digestion is taking place inside, while the gastric ~~juice~~ digestion is going on outside. As the food is gradually dissolved by this contact with the digestive fluids, it becomes liquified, passes on in this part of the stomach which is a sort of ejector. When the liquid portion reaches this point, this part of the stomach contracts like the bulb of an atomizer so this part of the stomach is compressed by its own contraction, and the liquid is forced out through the pyloric sphincter here, and as the food comes down here, accumulates, the liquid food which is highly acid, and the effect of the contact of this acid with the mucous membrane here is to cause the pylorus to open; and when it gets through the pylorus into the duodenum, as the acid liquid comes in contact with the duodenum, it causes the opposite thing to occur--the pylorus is reflexly closed, so here is an automatic arrangement by which the pylorus is opened and shut, opened and shut. It is a very curious arrangement indeed.

When I was a boy and studied physiology, the pylorus was described as a gate keeper that resided at the lower opening of the stomach. And I had a picture of a small man sitting up there somewhere opening and shutting the gate. The pylorus was supposed to exercise a sort of intelligence, but we know better now. The whole thing is operated through the medium of the gastric juice itself. The nerves of the mucous membrane of the stomach are so constituted that when the acid liquid comes in contact with them, they cause the pylorus to open; they cause the pylorus to open, but the same acid liquid passing down a few inches into the duodenum, comes in contact with ~~the~~ nerves that have a very interesting

function, and when stimulated by the acid liquid, the pylorus is caused to shut. When a person has highly acid gastric juice, that is too acid, this closing effect is too strong. The pylorus would open freely, but when the liquid, the very acid liquid reaches the duodenum, the duodenum is adapted to the alkaline fluid like bile, or the pancreatic juice, and when this very acid liquid comes down in contact with the mucous membrane, it has the effect to cause the pylorus to shut up so tight that it will not open again readily. The door sticks, so to speak; then as the stomach contracts and makes an effort to force the liquid contents out, the pylorus will not relax, and the result is the contracting stomach, contracting with greater and greater vigour, forces some of the contents of the stomach up into the mouth. Now, in the top of the stomach, when digestion is going on, there is always a little collection of air. This air is swallowed with the food, and rises to the top ~~xxxxxxx~~ of the mass of food, so generally the only thing that comes up through the mouth is air; but sometimes the contractions are so forcible that some of the liquid of the stomach will be forced out through the pylorus into the mouth also, and found to be very sour, very bitter sometimes, and a person thinks ~~as~~ fermentation is taking place in his stomach. It is not fermentation at all; it is simply hyperacidity, and the only thing that is necessary is that this acidity should be relieved. It generally can be relieved by drinking a quantity of hot water. That is the reason we advise patients to take water a couple of hours after meals, and when the acidity is very great, it does no harm to take a little soda, a small amount, half a teaspoonful perhaps of bicarbonate of soda along with the hot water, and this will neutralize the gastric juice so the pylorus will be opened up and the difficulty will be relieved.

Some other very interesting observations were made by Prof. Pawlow. He found that there are certain things which will increase the flow of gastric juice

juice, and some things which will diminish the flow of gastric juice. For instance, he found that the extracts of meat have a very powerful influence in stimulating the flow of gastric juice; the extracts of meat, Häbbig's extract of beef, and other substances of that sort. The most powerful of all is the extracts of meat that is somewhat advanced in decomposition, meat that has a high flavor--this is very powerful, because these products of putrefaction have a very powerful influence in stimulating the flow of gastric juice. The reason for it is this. The gastric juice is a disinfectant, and when the body finds in the stomach here, when Nature finds in the stomach a quantity of putrefying material, she immediately goes to work to disinfect it, and manufactures a large quantity of gastric juice to pour out there to disinfect that foodstuff.

Another substance that is very powerfully stimulating to the gastric glands is butyric acid. Butyric acid is the acid of rancid butter, the thing that gives to rancid butter its strong, unpleasant flavor. So butter that has a flavor of butyric acid in it, even if it is not very strong, is a very bad thing for a person to eat who has hyperacidity, who has gastric ulcer; so the same thing is true with reference to meats of all kinds, all sorts of meats are very bad for persons who have hyperacidity, who have acid stomach. Now, the old theory was that meat was just the thing for such persons, because people eating meat feel relieved for the time being, think the meat absorbs the acid and neutralizes it just as soda does, but that is only temporary, because at the same time, while the meat is absorbing the acid, it is stimulating the stomach to make more acid, so the difficulty is increased, and increases more and more. I know this from actual experience, because twenty years ago we used to treat our patients suffering with hyperacidity on beefsteaks. We used to eat two oxen a week here regularly. Our family was not as large then as it is now, not more than a quarter as large, but we ate a couple of oxen every week--not giving meat to

everybody, but only to those we thought really had to have it, ought to have it, and those who insisted upon having it. We gave it to both classes. Now, we know better. We have found out from Pawlow's experiments that meat is not necessary for anybody, and that these people that formerly we thought were benefited by it, were actually made worse by it. Pawlow proved that without any doubt at all, and this is now recognized by gastric specialists all over the world. Persons who give special attention to the treatment of diseases of the stomach the whole world over prescribe meat, prohibit it absolutely to all persons suffering from excessive acidity, and suffering from gastric ulcer and disease of similar character. In fact, an eminent gastric specialist some time ago made the statement that gastric ulcer is a meat eater's disease, and there is a good deal of evidence that cancer of the stomach is a meat eater's disease, because cancer of the stomach generally begins with ulcer of the stomach, so if ulcer of the stomach is caused by meat eating, cancer of the stomach also is caused by meat eating. Cancer of the stomach in this country is increasing very rapidly. Nearly one third of all the people who die of cancer die of cancer of the stomach and liver. Cancer of the stomach and liver kills about one third of all the people who die of cancer, and the number is very large. One twentieth of all the people who die in this country every year,--that means seven hundred thousand people,--die of cancer, and of the 75,000 that die of cancer, one third, or 25,000 of them in the United States alone die of cancer of the stomach, or cancer of the stomach and liver. And the use of meat probably is chiefly responsible for this fact. There are some other substances also which increase the flow of gastric juice. It was found that all foods which have flavor enough stimulate the flow of gastric juice. The flavors of foodstuffs stimulate the flow of gastric juice, and you can readily see then that the chewing of food, keeping the food in the mouth a long time, must have a very

powerful influence to cause an increased flow of gastric juice, and it certainly does. This is why if your stomach is slow, the best way to help that stomach is to chew a long time. That is why mastication of food, or fletcherizing, as it is sometimes called, is so very valuable. In fact, it is almost a panacea for some troubles. There is only one class of stomach troubles that it is good for, and that is cases in which the stomach makes too much gastric juice already. You don't want to encourage it to make too much gastric juice, so it is necessary to use food that is bland, and that will destroy the stimulation of the stomach. Prof. Pawlow found that different kinds of foods make different kinds of gastric juice.

Prof. Pawlow found, for example, that bread makes a gastric juice that has very great digestive power, very powerful digestive properties, and very little acidity; while meat makes a gastric juice that does not have the digestive power that the bread gastric juice produced, it has far greater acidity. The ~~bread~~ meat produces the most acid gastric juice of all foods, while bread produces a far less acid gastric juice, but gastric juice that is very powerful, has very great digestive power. Milk makes a gastric juice that has very low digestive power, and very little acidity. Fats of various sorts hinder the flow of gastric juice, prevent the flow of it. Olive oil hinders the flow of gastric juice more than any other food substance. Prof. Pawlow found that water produces a flow of gastric juice, which explains at once a thing that often occurs when patients say to me, "Doctor, my stomach is so sour, even water sours; I can not drink a glass of water without producing acidity in my stomach." Prof. Pawlow explains that by his observations upon dogs, by which he found that when he gave a dog a pint of water, the stomach poured out a large quantity of gastric juice; that water, when taken into the stomach in considerable quantity, caused the stomach to pour out gastric juice; so water does not cause fermentation of the stomach,

does not cause the stomach to sour, but it ~~xxx~~ simply stimulates the stomach, causes the stomach to pour out in abundance gastric juice; so people who have hyperacidity, ~~make~~ too much gastric juice, should avoid taking liquid food, and should eat food that is not liquid; and on the other hand, they should avoid taking dry food, because if they take dry food, they must chew it a great deal in order to be able to swallow it, and a large amount of chewing will cause the stomach to pour out a large amount of gastric juice; so it must be taken into the stomach in the form of a thick pulp, a pulp about the consistency of granola mush; that is just the thing for a person suffering with hyperpepsia, with acidity; or breakfast toast softened--what we call ^{cream} ~~graxx~~ toast is just about the right thing for a person suffering with hyper~~xxx~~ acidity, or granose biscuit softened with a little cream would be an ideal thing for such a person, or a little water toast with a little butter added to it would be a very good food for a person suffering from hyperacidity. Any pulpy food, but some fat should be taken with it, because fat hinders the stomach from making gastric juice.

Now, another observation made by Prof. Pawlow was very interesting, and that was that while water causes a very abundant outflow of gastric juice, if there is a small amount of soda introduced into the water, so small an amount as one grain of soda in a pint of water, that one grain of soda absolutely ~~exxx~~ prevents the secretion of gastric juice. So you see soda ~~is~~ has a very powerful effect in hindering gastric ~~jux~~ digestion, and we must condemn all breadstuffs that are made with saleratus or with baking powder. Baking powder is an exceedingly detrimental thing. Doubtless thousands of people are suffering from worn out stomachs, suffering from dyspepsia and indigestion because their stomachs have been worn out with baking powders. It is a lazy woman's method of making bread, or shall I say an ignorant woman's method of making bread. Bread does not

require any raising material of that sort. We do not need to add chemicals. A good many years ago, I think 25 or thirty years ago, I was down in old Virginia and at the hotel table I was served with beaten biscuit, and I really thought it was the most delicious bread I ever tasted in my life; so I hunted up the cook and found out how to make these Virginia beaten biscuit, and I found they were made simply by making a stiff dough with flour, water, and a little salt, and a little butter perhaps added, and the dough was beaten, beaten, beaten until the air was beaten into it, then it was made into these little round balls, put into the oven, and the air in the dough caused it to expand by the heat, so it was a most deliciously light and crisp biscuit, and I have never discovered any better way of making bread yet. I found this method in use in some other parts of the world. The Mexicans knead the dough, roll it with a round or cylindrical stone, then pat it out into little thin cakes, and bake it as we bake our griddle cakes on a hot tin. And in Arabia I have seen the native Arab woman making bread in just the same way; so it is not merely a modern discovery; it is the old fashioned method of making bread--everything necessary right there in the grain, in the flour, with water and air; these are all that is necessary to make very light nice bread, but it requires a little more labor. It is easier to stir in some baking powder, put it into the oven, than to take care of it yourself. But the raising can be done just as well, just as perfectly with the natural elements, air and water. I am saying a word on this subject because I hope when you go home, you will dismiss baking powder from your house altogether, turn it outdoors. We don't allow it here in the Sanitarium, never use it in our cookery, and we make bread just as light as it is possible to wish it to be--cake and everything of that sort can be made without any baking powder at all. There are other methods I have not mentioned of making light bread. Beaten biscuit is not the only method. Those of you who are interested should go down to the

cooking school. You can get instruction there without charge, and I wish every person in this house would go to the cooking school and get some instruction before going home, so you can instruct your neighbors and cooks and get them started in a rational mode of life.

Of course, all sorts of animal fats and vegetable fats as well hinder the flow of gastric juice, as I just mentioned to you; and that is the reason why fats have the reputation of making people bilious. It is an old idea that fats cause biliousness. It is not because the fats clog the liver, but it is because the fats hinder the stomach from making the gastric juice which is necessary to digest food, so the food is after while pushed along down into the intestine, and not being digested, it rots, it decays, and this process of putrefaction in the intestine produces quantities of poisons which flood the blood and the body and make a person miserable and wretched, and everything about that state that is called biliousness--it is simply acute auto-intoxication.

There were other observations made by Pawlow, and made by Beaumont before his time, who had an opportunity to study the stomach of Alexis St. Martin. Alexis St. Martin was a hunter who had an accident--a gun discharged three or four feet from his body obliquely directed toward his body, and the full charge of duck shot was received upon the abdominal wall and the chest, over the stomach, and tore away the abdominal wall, and the wall of the stomach itself, and a part of the wall of the chest, so that when Dr. Beaumont found he could look right into this great gaping place and see his lungs and his heart beating, could look right into the inside of his stomach. He thought the man would certainly die, but he refused to die, and when he got well, the edge of the opening in his stomach was grown fast to the edge of the opening in the skin, so there was a window right straight through into his stomach; and Dr. Beaumont hired this Canadian, Alexis St. Martin, to live with him as a servant, and he made experiments upon him for several years.

He had put into the stomach various sorts of food, then he would watch and see what happened to it, and would notice the effect. He noticed that when he put mustard, pepper, peppersauce, ginger and things of that kind into the stomach, when it had that rosy gray, that at once it became reddened like a bloodshot eye; and if it was continued, after while the stomach became very much inflamed. And Dr. Ogata made some experiments upon dogs, and he found cane sugar has just the same effect. That is the reason why we have no mustard, pepper, peppersauce ginger ~~xxxxxx~~ or any of those things upon our table. It is because they cause this congestion and inflammation of the stomach, and that is the reason why we recommend malt sugar instead of cane sugar--because in the sensitive stomach the malt sugar does not produce this inflamed effect, whereas the cane sugar does. So we recommend everybody, especially people who have sensitive stomachs, to use malt sugar. It may be taken in the form of dry sugar, or of malt honey,--the same thing--instead of cane sugar. Many people can not take cane sugar at all without pain, but are able to use the malt sugar very well without any difficulty. We have found it is very valuable in treating cases of gastric ulcer; it is of very great service indeed.

Now, observations were made by Pawlow upon the liver also, and one of his observations I will explain to you in a moment, but first we must look at the liver and see this great gland which has five lobes, which is the largest gland in the body, weighs three and a half pounds,--see what its functions are. The liver has wonderful vitality. The lower down the scale we go, the more important the function of the liver seems to be. For instance, there is the oyster with its enormous liver. The oyster's liver is pretty nearly half of the whole body. It is the large brown end of the oyster; that is his excretory liver and kidney; or his ~~auxiliary~~ organ. In the dog we have a liver four times as big as the human liver in proportion to its size. The turkey buzzard has an

enormous liver. Over in Germany they feed their geese in such a way as to make an enlargement of the liver, and produce disease of the liver by overfeeding. I saw described lately a new machine they have got for feeding these geese. The geese are fastened to a plank, with their eyes put out, and their feet fastened to a plank, and kept in the dark so they are moved around as little as possible. Once in every two hours a woman goes around with little pills of dough, opens the mouth of the goose and with a little ramrod pushes it down into the stomach. But now they have got a machine that works by electricity in some way, and pumps the food down into the stomach and does it a little quicker, and the result is, the liver after while undergoes fatty degeneration and fills a large part of the inside of the goose; then the goose is killed, and those great, fat, degenerated, diseased livers are made into a paste, and that is one of the delicacies put upon the hotel tables, pate des foie gras--some of you know it, and you have perhaps thought it was very delectable. It is made up of the diseased livers of geese that have been fattened the way I am telling you.

Now, there are some people who treat their livers very much in the same way. That is what I wanted to tell you about. While they do not eat every two hours, ^{or} ~~they~~ feed themselves with pills or pellets pushed down with a stick, they nevertheless live upon food which destroys the liver and affects it in exactly the same way as those overfed geese. Overfeeding is one of the things that destroys the liver, because the liver is a digestive organ. After dinner, the liver is half an inch bigger than before. It dissolves some of the food substances into itself, and holds them there before passing them on. After dinner, or after the liver has become degenerated with fat, the liver cells are all filled with fat. There are various substances that disturb the liver although the liver has enormous vitality. If it was not for that fact, I suppose we would all have been dead long before this. A German investigator some time ago made

an experiment upon a rabbit. He cut off half the liver, and in three months, he examined the rabbit and found that half had grown on again. Then he cut off the other half, and removed that, and in three months more, he examined the rabbit, and this half had grown on, so the rabbit had a brand new liver. That is what some of you are looking for, and I hope you will find it, for the liver has this power to reproduce itself, and to repair itself, and to stand an enormous amount of damage; and that is why it has been possible for us all to take so many changes as we have.

The most important function of the liver is to destroy poisons. That is one of its most important functions--to destroy poisons--these poisons that are absorbed from the colon and other poisons that may be swallowed in water are taken up in this large portal vein and carried into the liver, distributed through the liver, and the liver destroys the poisons, or filters the poisons out. That is why it is possible for a person to take water that comes through lead pipes for many years without suffering any injury, because the water keeps taking the lead off the pipes, and the liver takes the lead out of the water and stores it up in itself. That is why you can take a dose of mercury or of calomel or something else whenever you feel bilious, because the liver seizes on that calomel and stores it up in itself, and so protects the body from the damaging effect of this powerful and poisonous drug. It depends somewhat upon how it is used as to how poisonous its properties are; but it is the liver that protects us against all these poisons. The man who smokes can smoke a long time, because his liver catches the nicotine and destroys it and so saves his brain and other vital organs from the damaging effect of this drug. The same is true of the man who uses beer and alcohol, and the man treats himself in this way--it is his liver that stands between him and death and is working for him, fighting for him. But the liver by and by gets infected and overworked. Among other things,

it destroys bacteria. But it has to be wide awake to catch the bacteria and destroy them, and if it does not destroy them, they get by it into the gall-bladder where they do harm; they stay there for years. Sometime ago I operated upon the gall-bladder of a man, removed some stones from his gall-bladder and found to my astonishment that these gallstones had typhoid fever germs inside of them; and upon inquiry it was found that the man had had typhoid fever fifteen years before, and those typhoid fever germs had been stored up in the gallstones there in his gall-bladder all that time. It is now quite well known, though it was not so well known at that time, but it is now quite well known that the gall bladder is a place where typhoid fever germs remain for a long time sometimes, after a case of typhoid fever, so the patient becomes a typhoid carrier, and he goes about scattering these typhoid fever germs everywhere he goes, and becomes a means of infection to other people, because his liver is worn out in defending the body, and it no longer has the power to destroy the bacteria which are growing there, as it should do. So the liver is one of the most interesting and versatile organs in the entire body.

This picture shows you the liver cells where the wonderful work of protecting the body is done. These cells make the bile, and separate the lead calomel and other poisons, destroy nicotine and other bad poisons that are absorbed from putrefying materials in the colon and destroy these poisons. This work is carried on most faithfully, but only so long as the cells are intact. When these cells become degenerated, when they become overwhelmed with fat globules, and deteriorated, then they can not do the work.

Now, here is one experiment Pawlow made that I have told you about. I saw it made in his laboratory. A dog had an operation performed upon it by which the portal vein was connected with the ascending vena cava. The ascending vena cava carries the blood straight to the heart, and so on around the body;

but the portal vein carries the blood to the liver and after it has been purified, then it goes into the vena cava. But by this operation, an opening was formed between the portal vein and the ascending vena cava. Then the portal vein was tied so that no blood could pass through the portal vein to the liver, and the result was all the blood, laden with poisons that formerly passed through the portal vein then through the liver for purification,--all this blood passed directly into the body of the animal. Now, this dog got along all right and enjoyed good health. Those dogs always do get along all right for some time after the operation,--as long as the dog is fed upon an antitodic diet such as you find upon our tables upstairs, and as long as the dog lives on a Sanitarium diet, it is perfectly well. But after while the dog was given meat to eat, and in three days it was a dead dog. And a dead dog is not worth very much. Now, there are a whole lot of people doing the very same sort of thing that dog did. They are eating meat with crippled livers. Experiments have been made on men who have smoked for a series of years, and every person who has been a heavy meat eater, every person who has been a habitual user of tea and coffee, every person who has been addicted to the use of alcohol, persons whose habits of life ~~xxxxx~~ have been sedentary--every person who has suffered from inactive bowels, who has constipation, every person who has a dingy skin, and black circles around their eyes, and brown circles, spots upon their hands, and a dingy skin,--every person who has a coated tongue and is subject to bilious attacks,--every such person has a crippled liver. It would not be possible for him to be in such a state, for anybody to be in such a condition as I have described if unless the liver had first become crippled; for the liver does its duty as long as it possibly can, keeps the body pure and clean; but when we see evidences accumulating, of impurities in the body, then we know that the liver is crippled, so every person who is in that condition that I have mentioned here is very much

in the condition of the Pawlow dog. This is what is known as Eck's fistula, and a dog that has Eck's fistula can not eat meat; it is a fatal thing for the dog to eat meat; in three days it is dead if it eats meat. While the same thing would be absolutely true of the man who has a crippled liver, his liver may not be absolutely crippled, but it is so seriously crippled that this is measurably true. The man whose liver is crippled, the more meat he eats the sooner there is going to be a funeral in his case. He is preparing for a funeral, for his liver is damaged and can not deal with meat.

This fact shows that the liver does something that is necessary to be done when the man eats meat. A dog can not live unless the liver does something to protect the body against the injurious influences of meat. But if the dog does not eat meat, he can get along and live comfortably provided the diet is a non toxic diet. I am telling you this so you can see that the bill of fare of the Sanitarium dining room is not made out without a good reason for it. It is not simply to satisfy a whim or a fancy or precedent, or anything of that sort, but simply to give to you the conditions which modern science shows are absolutely necessary for the best possible progress toward health; and my great ambition is that while my friends are here, while our guests are here under this roof, that I may persuade at least the more intelligent ones of you--if there is any difference--to continue to live in the way which we point out to you while you are here. I am giving you these scientific facts for every one of which I am able to vouch and demonstrate, give you the absolute, positive evidence of it. I can give you the absolute, positive proof of every statement I make here, and I take the trouble to do this because I hope some of you at least, when you go home, will keep on in the way in which you are taught to walk while you are here,--the only way in which you can preserve the help you got while here.

My friend the oyster. An anonymous poet wrote a poem about the oyster.

"That man must have had a palate covered o'er
 With brass, ~~xxxxxxx~~ or steel, who on the rocky shore
 First broke the oozy oyster's slimy coat
 And risked the reeking morsel down his throat."

If he had ever dissected an oyster, looked inside of it, he certainly would not ~~xxxx~~ have felt that way about it. I think this is the mouth of the oyster. Here are the gills. This is where the oyster breathes. And the oyster has a very large mouth, and the oyster passes the water through this and catches or strains off by a whole lot of little hairs in there, strains off the diatoms of food, and things of that sort. You see an oyster buisy getting his breakfast at the slimy bottom of the ocean, you will see he has his mouth wrapped around the slimy stems of seaweeds or scrapig the slime off a stone. The oyster is a scavenger. Here is the small intestine; here are various other parts. We can nd pick them out. Here is the liver, or part of it. Here is the nice brown eng-- the kidneys. Liver and kidneys are pretty closely associated. Here are the intestines. Here is the stomach, and here the heart. The next time you eat an oyster, reflect upon his anatomy, for example, and see how much it will add to the delight of masticating him. For instance, when chewing up that brown end, ju & remember that is the oysters liver and kidneys; and if you find something that seems something like a string, that is the oyster's small intestine. It is all there; you swallow an oyster on the halfshell, you swallow him all; he is all there.

I was very much amused some time ago. It was discovered in England that typhoid fever was breaking out in epidemics where the water was all right, and after while broke out in the family of the Prince of Wales, and it was discovered that the young man who was sick, one of his children, had contracted typhoid fever from eating oysters; and the fact was published in the newspapers, and the oyster business at once went down almost to zero; nobody dared eat

oysters, because the son of the Prince of Wales had typhoid fever from eating oysters, so it must be bad to eat oysters. When an investigation was made, a very important discovery was made--that the oyster beds were all swarming with typhoid fever germs. Oysters generally grow most abundantly right around the mouths of rivers, which, of course, bring down the sewage from the big towns upon their banks, and the oysters live upon the sewage, and really the fattening grounds for oysters are the mouths of great rivers where the sewage of great cities is emptied; then after the oysters are caught, they are usually taken up into fresh water for a while to take a drink, as the oystermen say. The oyster swells up to about twice its size in salt water. So the man can get twice as much for his oyster, you see, for they weigh twice as much when they have had a drink. Dr. Wiley some little time ago undertook to get this practice suppressed, because while they are drinking fresh water, they are taking in typhoid fever germs also, getting more and more infected. It was found in this examination made in England that as far as a mile out from shore oysters were found that had typhoid fever germs in their stomachs, even at a depth of 400 or 500 feet. Oysters live upon these bacteria; that is their regular diet. There was a great stir made in England, and in order to protect the oyster men, it was suggested that they should have a corps of oysters inspectors whose duty it should be to inspect the oysters, to guarantee they had no typhoid fever. Of course, when an oyster has typhoid fever and the doctor comes along takes his temperature, feels his pulse, he could throw him out; but it looks as though it would require a pretty large number of inspectors to look at the tongue and feel the pulse and take the temperature of every oyster that was offered for sale in the market; so it was given ^{up} ~~out~~ as a hopeless task. The oyster had better be left to carry on his business as a public scavenger rather than to appear upon the table.

Here is another organ that is very important in the digestive process-- the pancreas. Here is the spleen. These organs are not only digestive organs; they are controlled by the same principles and laws which control the salivary glands and the stomach, as Pawlow has discovered, and influenced by the sense of taste governed by the papillae at the back of the tongue; but the pancreas also manufacture a substance which helps to destroy poisons. Some poisons in spite of the liver activity will escape and get into the blood; and it is necessary to have glands to destroy these poisons. The pancreas is one, and another is the thyroid gland. It used to be supposed the thyroid gland had no particular function. It was thought to be a vestige of something that was in use some time in embryonic life perhaps; but now we know the function of the thyroid gland is to destroy poisons. Some German physiologists removed the thyroid glands from dogs and they all died in a short time with spasms. Afterward a French investigator made the same operation upon rabbits--removed their thyroid glands, and they got along all right. Another investigator then removed the thyroid glands from dogs, and fed his dogs upon bread and milk, as Pawlow did after his Eck's fistula, and the dogs lived and thrived, but as soon as he put the dogs on a meat diet, they began to get sick and in a few weeks died of spasm; so it became very apparent that one of the functions of the thyroid gland, as of the liver, is to destroy poisons which arise from meat eating, and the poisons which are found in meat, doubtless, and poisons which are probably formed by the putrefaction of undigested portions of meat in the colon. So we know that if a person has no thyroid gland, or has a badly diseased thyroid gland, he should not eat any meat. A person who has a diseased thyroid gland should avoid the use of meats. When the thyroid gland or any part of it has been removed, that means that meat should be entirely discarded, and not eat any more. It is more than probable that meat eating is one of the great causes of thyroid disease. In

certain parts of Switzerland, there are places where they have goiters from very extensively, sometimes enormous goiters hanging clear down to the waist, that are sustained by bands around the neck; and these goiters are found to be produced by water from certain wells; and a study of the matter in recent times has shown that the water from these wells is different from the water from other wells in that it produced goiter and that it has a different source. The water was found to produce goiter when given to animals, even to fishes when placed in the water. It was found by investigation that the water in these goiter wells comes from old sea bottoms and contained the remains of fossil fishes and other animals that were buried in that old sea bottom, but that the water that came from granite sources, and chalk formations does not produce goiter, but only water that comes from old sea bottoms. This was pointed out by an eminent German professor not very long ago.

Some poisons escape the thyroid. The suprarenal capsule is useful also as a means of producing substances which destroy poisons. It was noted long ago that when a person has large, diseased suprarenal capsules, the skin becomes very much pigmented. We know now that is simply the accumulation of poisons in the body, that cause this pigmentation of the skin, because the suprarenal capsule is diseased and is not able to destroy these poisons. Meat eating overworks these glands; meat eating overworks the liver, the suprarenal capsule and the other poison-destroying glands, and so in all these different ways meat-eating contributes to auto-intoxication, not only through the intestinal putrefaction, but through flooding the tissues with poisons that are found in the meat. The colon is the principal source of the production of these poisons.

Here we see the colon is partly removed from the upper part of the omentum. This great omentum hangs down in front of the intestines. It is

one of the most wonderful structures in the body. If there is inflammation of the appendix, the omentum comes down and wraps itself around it. If there is inflammation away up at the gall-bladder, the omentum climbs up there and wraps itself around the gall-bladder. Whenever there is any infection, the membranous apron, the omentum, works its way around, gets in there where the trouble is going on, and protects the body. It is frequently referred to in medical papers as the abdominal doctor. It comes at once when it is called, and does its work in a marvelous way.

Here is another illustration of this marvelous intelligence working in the body as shown by what happens when a pin sticks into the mucous membrane, having been swallowed. The mucous membrane begins to thicken up, gets thicker and thicker, and the intestine begins to push itself up against it, keeps pushing up further and further and by and by it gets pushed clear over, and the pin is going downstream head foremost, and all is well. This is an experiment made by Prof. Roger, of Paris, the pupil of the great Prof. Bouchard, and published in a recent book the actual observation made, which shows that there is an intelligence at work in the body, and the process of digestion is controlled in a marvelous way that I have explained to you, by the taste buds in the mouth. All of these digestive processes, these poison-destroying operations that are continually carried on, all this work that is carried forward is all evidence of the presence of an Intelligence that is protecting us continually against the inroads of disease. The colon through abuse gets all tangled up. The cecum becomes enormously enlarged, the appendix is buried down underneath, and the transverse colon becomes prolapsed, and the sigmoid flexure enormously enlarged, and the consequence is retention of materials in the colon. When the colon becomes crippled so badly as it is in these cases, it is not always possible for it, in advanced years particularly, to approximate its normal functions

permanently; it is necessary continually to make use of special means for the complete evacuation of the colon; necessary to use specially laxative foods, such as bran and lettuce, and fresh substances. And abundance of bulky food must be given, and such substances as are laxative. Agar agar, Japanese seaweed, is of very great value. Malt honey, sweet substances of all sorts are laxative. We can not recommend cane sugar for that purpose, because it is harmful to the stomach, but malt honey is a real laxative, and of very great value. And not only must laxative foods be used, but antitoxic foods. Dr. Arbuthnot Lane of England has gone so far as to hold that these crippled colons should be removed, and he has performed the operation in a large number of cases, and the patients have made remarkable recoveries. We find it is not necessary to remove the colon, but only to take care of it, to keep it clean by frequent bowel movements. The bowels ought to move after every meal, or at least twice a day, and three times is better. Dr. Shepard, the great missionary surgeon of Turkey, tells me that when a Turk comes to him and talks to him about his health, about the first thing he says to him generally is, "I am sure I am sick, Doctor, because my bowels move only once a day, and I know I must be sick." It is the universal custom among the Turks that the bowels should move two or three times a day; and this rids the body of an enormous amount of poison.

You see here illustrated the difference between a meat diet and a poison diet and a right diet. The Sanitarium bill of fare produces this you see in this column, and the ~~max~~ ordinary mixed diet produces what you see in this column. You see the quantity of urine produced by the meat diet is nearly one half larger, because the kidneys have so much more work to do, and the acidity is more than twice as great. The total nitrogen, which consists of poisonous substances which must be eliminated, is nearly three times as great. The urea you see is almost three times as great; then when you come to

Ammonia, which is a very great poison, it is almost four times as great, and the creatin twice as great; so you see all the way down, three times as great-- the sulphur found present and eliminated. Then we come down to indican. You see here it is nearly fifteen times as great. In fact, on a perfect regulation of the diet, there should be no indican at all. Now, when we find this state of things, as I said, as a result of a diet, it means that the kidneys are enormously overworked, and they must be worn out earlier; so Bright's disease will come at an earlier date. We must live in such a way as to give our bodies as little work as possible. If we want to make the best use of our lives, we must use our livers less, give our stomachs and livers as little work to do as necessary. If we impose upon our livers and stomachs and the rest of the body too much work, there won't be enough energy left for brain work. We are suffering as the result of constant overwork of internal organs.

Notice how regular these teeth are. These are the teeth of a mound builder. See how splendidly matched they are, and all in place, aren't they? I have some skulls removed from Roberts' Island, San Francisco Bay, and we find the teeth in perfect condition. The reason why, is because they lived upon natural foods, upon cereals instead of meat. We need thirteen grains of lime a day, and meat contains only half a grain to the pound, whereas peas contain eight grains to the pound. Fine flour has only one grain to the pound, while wheat has four; so you see if we are going to get lime enough for our bones and teeth, we must eat something besides meat. The reason why we do not find lime in the meat is because when the hog eats corn, the lime in the corn goes into the bones, and when we eat it, we do not eat the bones. If we are going to get the lime back that was in that corn, we have to eat the whole hog, bones and all. See how splendidly developed these teeth were. The teeth are worn down almost to the root, but without the slightest evidence of decay. This is

a Mound Builder's skull, an old man, with sixteen sound teeth in each jaw. You can hardly find such a thing nowadays. He lived upon a vegetable diet. That is why his teeth are so much worn. If he had lived on a meat diet, the teeth would not have been worn like that. The meat does not require chewing; it is digested without chewing, only requires to be broken up and swallowed. This Mound Builder lived upon the natural products of the earth and he chewed; and the Indian still takes pains to masticate his food thoroughly and still has good teeth, and one of the things he is very fond of is the parched wild rice which he gathers in the fall from the wild rice fields growing in the lakes of Dakota and Minnesota. Wild rice does not have the tendencies ordinary rice has, and contains more lime than almost any other cereal I know of. This shows how the Indians gather the rice, and roast it in kettles. Flowers live naturally, and they are healthy and beautiful and strong; and the squirrel does the same thing. The squirrel lives upon the diet that was assigned to him to eat at the beginning. Man has departed, wandered away from his normal bill of fare, yet once in a while we can get some good, sturdy young fellows to adopt the Sanitarium diet, and it agrees with them. These boys are well sustained by the non flesh diet, and we find sometimes people come along and visit the institution here, become pretty well converted to our principles and profit by them.

This little group some of you will recall. For instance, here is Prof. Irving Fisher. He came here an invalid as he has told you right from this floor repeatedly, and he has profited by the low protein diet. He has discarded meats entirely from his household, and his wife and children are thriving, and the little ones are growing up splendidly on a meatless diet. This is S. S. McClure, the editor of McClure's Magazine. He spent a few weeks here a couple of years ago, and he found himself rejuvenated. He had been practically broken down for several years, but by discarding meat, in a little while he got a new supply of efficiency. He considers himself now more vigorous and enduring than he

has been for many, many years. In fact, he thinks he has added twenty-five years to his life by leaving out meat, tea, coffee, and adopting a sanitary mode of life. He made the statement in public here that he would as soon think of getting down on all fours out on the street and licking up dirt as to eat a piece of beefsteak. He absolutely abhors it. And this is Mr. Gifford Pinchot, whose genial face you see here. Mr. Pinchot wrote me not long ago that he was enjoying better health than for ten years. I had a card from him a day or two ago from Rome, saying he was in perfect health, and he was not in perfect health three months ago. He has made a marvelous uplift by simply adopting a rational diet. Just think what a little change it is--dropping out beefsteaks, eating the natural food God designed for us to eat--how little trouble it is to do that. The things that cause us trouble really have the most tremendous influence upon our lives and destinies. Sir Horace Plunket, the man who has done so much for Ireland in an agricultural way, and an economic way, was also with us about the holiday season, and he has been trying the low protein diet and with wonderful benefit, so much benefit he intimated he was going to send some one over here to learn the Sanitarium methods of cookery so they might be introduced into the agricultural colleges of Ireland. This other fellow here has been trying it out 45 years, and he has still enough energy left so that he is able to stand at the operating table, as I did yesterday eight hours steady, doing operations, got home at eleven o'clock, and able still to do some more work without exhausting the surplus of energy; but I fear I have tired you all out tonight. So I will say good night and let you go to sleep.

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FACE DEGENERACY.

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday,
April 16, 1911, at 8:00 P. M.

By,

J. H. Kellogg, M.D.

Ladies and gentlemen: I think I have the most patient audience in the world. (8:35 P.M.) We have the orchestra come in here so you will be entertained when you have to wait a few minutes, so as to make it as pleasant for you as we can. I have not been loafing, or idling, or taking a rest. I have been driven to distraction, almost, in trying to get through with my duties so as to get in and not keep you waiting a moment. Now, I am going to talk to you a little tonight on a subject which I frequently talk about--how we are going down hill, and what we have got to do to turn the tide. I have spent a few days at the capital of the State getting up very early in the morning and getting home very late at night, putting in two whole days as hard as I could work trying to get through some health bills to help save the lives of our fellow-citizens of Michigan, and I think I will tell you a word about it, so that some of you perhaps will set to going similar activities when you return home to your states, if you have not already done so,--things that ought to be looked after.

The most important thing in the world that any legislature can do is to protect the morals and the health of its citizens, to make laws to protect the morals and the health of its citizens. And these two things are more neglected than almost any other things in legislation. It is a great deal easier to get a law through of some sort that is going to help enrich people's pocket books, a greatdeal easier to get a law through for the protection of pigs

amazing what an ~~am~~ apathy there is on this question of human life. Now, I made a discovery during the last few weeks since I have been studying statistics, the latest reports, and I have found that Michigan is losing its standing as a healthy state. Six years ago our death rate was only 13.3 to the thousand, which is very, very low, and during the years 1906 to 1911, the average was 14. That means that is an average of .7 per cent more than ought to die now; because there is no reason why we should not be just as healthy in 1911 as in 1905; and when we find the death rate is climbing up, it means there is something wrong with the people of the state--that they are ignorant and ought to be informed, that they ought to be educated. That is what it means. Now, it means when you come to apply it to our population, that we have lost in the State of Michigan in three years 5500 people that we should not have lost, that we ought not to have lost, 5500 people died who should not have died; 5500 lives went out that ought to have been saved, because our death rate has been coming up when it ought to have been going down.

In our neighboring state of Indiana, for example, the death rate has been going steadily down, while in Michigan the death rate has been steadily coming up; while in the State of Indiana at the present time, a state where they have more mosquitoes than Michigan and hence more malaria, and where they have more typhoid fever than in Michigan, where they have not so good a climate as we have in Michigan with those great inland seas surrounding us almost like an island,--the death rate is only 12.2--just think of it, 1.8 less than the average in Michigan for the years mentioned, and that means a saving in Indiana of 12000 people--just think of it; it means a saving of lives of twelve thousand people in three years. That means four thousand people a year die in the State of Michigan that would not die if we all lived down in Indiana. Now, you know, I think that we would be better off if we could get the name of our state changed to Indiana, and could get the health administration of the State of Indiana

extended over the state of Michigan. If we were all under the fatherly care of good Dr. Hurty, who is responsible for the reduction of the death rate down in the State of Indiana, it would be the greatest possible blessing to us; but now that I am a member of the state board of health, I begin to feel a fatherly interest in every citizen here, and feel it my duty to see that steps are taken that can be taken to lower our death rate; and one of the things I am trying to create is a milk inspector in every community wherever milk is sold. Just think of the shame of the present situation when any old farmer can keep any old cow that has got tuberculosis or anything else, and can milk that old cow and into any old kind of a dish, and can feed her on any old kind of slops, and can empty the distilled slops in the shape of milk, supposed to be milk, anything in any old kind of a tin dish called a milk can, and carry it to market in any old sort of wagon. I saw one going down to the market the other day, and he had an empty garbage can in the back of his wagon, and a full milk can in the front of his wagon, and when he went back, his milk can was empty and his garbage can was full; and when he went back to market the next day, what went home with him in the afternoon in the back end of his wagon, went to town in the front end of his wagon, don't you see? He takes the garbage in at the back door, and takes it out next day from the front door. Then he calls it milk, you know, and the people feed it to their babies, and the babies die, and charge it to Providence.

Now, it is time to reform, to wake up, to get a little more sensible. So it is with many other things. Ice--who looks after the ice? Who looks after the matter of ice, to know where that ice came from? Who knows how much filth and dirt there is frozen up in the ice? When the ice is thawed out, the germs are just as bad as before they were frozen up; they come up smiling in the spring, like the blossoms, and they begin their pernicious activity at once, and if you swallow some typhoid fever germs that have been frozen up all winter,

they are not the least bit weakened by it; their long winter's freezing simply has accumulated energy by their rest, and attack you in good earnest.

There is another thing that needs to be done in every state. A few states are making an investigation of the question of cold storage meat. What has been going on for years and years and years since cold storage was discovered, since cold storage warehouses began to be built? An animal dies, gets hit in the head, gets its throat cut, or dies some other way, and is put in to this great public morgue called a cold storage warehouse, and there it is supposed to be frozen up, and it just lies about there for months and months, and years and years, maybe, and nobody knows how long. A short time ago a health officer got into a cold storage warehouse and he found some dead deer lying about there that were stamped that indicated that they had died in the year 1905. And they had been lying there waiting to be buried all this time. Just think of it, just think of it. Another investigator--I heard about this just a few days ago,-- got into a cold storage warehouse somewhere, and he found some fish that had been in there for twenty years; and all the fish that were there had been in there all the way from seven to twenty years, and there were tons of them, and they were doling them out to people. That thing was stopped by the health officer in one state, in Pennsylvania, because they made a law; and in New Jersey and several other states they have a law prohibiting the sale of these dead carcasses that have been lying around so long in cold storage, or anywhere else, prohibiting their sale; an animal can not be kept in cold storage and sold for food after more than three months. That is quite too long. But that certainly is the very limit. Now, just think of it. A man told me some time ago he knew of a man in New York--it was the man who owned the warehouse, the proprietor of it,--that he found there in his own warehouse ducks and geese and chickens that had been there for three years --for three years, getting better all the time, getting a high flavor, a haut gout, as the French call it, getting

very gamey, and ready for Christmas; saved sometimes for years ahead. Now, if we do not have a law of that sort in Michigan, you see, all the states around us will be emptying their cold storage warehouses into Michigan, and you will see what we will have here--a regular epidemic of appendicitis; for statistics have shown that appendicitis has increased enormously since cold storage came into fashion. Now, we are going to see some of the consequences of these things. We are going down hill very fast. One of the proofs of it is that the birth rate is diminishing.

The estimate of this birth rate is based, not upon the whole population, but among the number of possible mothers, between the ages of fifteen and 45. The population of women, the number of women in the population between fifteen and forty-five years of age, and this indicates the diminished birth rate in proportion to the number of women; and you see how it is. In New South Wales, it has diminished 30.6% in the last twenty years. In South Australia, 24, in New Zealand 24, Victoria 24, and Western Australia 23, Queensland 23, and the United States 20. The birth rate has dropped off in 22 years 20 per cent. Just think about how fast we are going down. We ought to have been going the other way. This is race suicide as sure as the world. In Belgium the rate has diminished 19.8, in France, 19.7%. So you see it is diminishing more rapidly in the United States than it is in France. England and Wales 17, Scotland 12, Denmark 9.8, Sweden 8.2, Norway 3.7, Italy 2.5. There are only four countries in the world where there has been an increase. Spain, .4 of one per cent; Austria, .8, and ~~Mexico~~ Ireland 2.3--Ireland is coming up; they are expecting to have home rule there, so they are cultivating home rulers, don't you see? They are improving a little. Now, here in this country, where we raise kings and queens, where every man is supposed to be a ruler in this republican country, ^{certainly} ~~where~~ death rate ought not to be dropping off. Now, we will hurry on and look at some other things.

There are a whole lot of things that are well worth considering. Not only is the birth rate diminishing, but the babies are dying off. The babies that are born, a large proportion of them, pretty nearly half of them die in New England and some other parts of the country, pretty nearly half of these babies that are born have the misfortune to have incompetent mothers, mothers that are unable to nurse them; or if they are able to nurse them, they are unwilling to nurse them; they think it is too much trouble, so those little ones have to have a cow, have a wet nurse; the poor little things have to be brought up on a calves' diet, and it doesn't agree with them. Just look at the difference. Breast fed babies have a mortality of seven per cent. That is, one in fourteen of babies nursed in a normal way die, one in fourteen of them die during the first year; but of the bottle fed babies, fifty per cent of them die in the first year. Now, that is a terrible sacrifice. Just think of it--half of all the babies that are bottle fed die before they are a year old, and only one out of fourteen of the babies that are properly nursed die before they are a year old. Think what the mother is doing. I may say what a crime a mother is committing who refuses to nurse her infant. If the baby dies before it is a year old, you see what the probabilities are here. The probabilities are seven to one that she killed the baby herself, with her own hands. She might better have strangled it, she might better have thrown it into the river with a stone tied about its neck, she might better have cut its throat or knocked it in the head than to kill it by slow torture with cows' milk, with the indigestion and the bowels troubles, and the awful suffering the poor little one has to go through; and the worrisome nights; and the mothers think it is a terrible thing to be kept awake by the crying of the baby, but think what the baby feels. Think what the baby is suffering that wants to cry, when it has to suffer pain. It is bad enough for the mother, but the baby is ten times as bad off; and by and by,

for months and months it is emaciated, a mere skeleton, nothing but skin and bones, and it gasps out its last little breath and becomes food for worms, just because the mother would not nurse it. Maybe the mother could not nurse it. Dr. Bunge has investigated that subject, and he finds that when a mother is unable to nurse her child, one of two things is the probable cause of it. Either the mother's father was a drunkard, or else her mother refused to nurse her, or was incapable of nursing her. It is a hereditary defect. When a mother is not able to nurse a child, her daughter will not be able to nurse her child. It is a hereditary defect, and it is a consequence of race degeneracy, and liquor is one of the causes of it. Prof. Bunge found it was a most common cause of it,-- was intemperance on the part of the father. Girls take after their fathers, and boys take after their mothers, and that is one of the hereditary effects of drink that has not yet come to be very widely known, but you see what a terrible thing it is. Pretty nearly half the mothers are not able to nurse their babies, and half of those babies that are nursed on bottles, fed on bottles die; so you see we trace it back to the drunken father who is responsible for the death of pretty nearly half of the babies that die; pretty nearly half of all the babies that die, because their fathers were intemperate. In the tenement house districts of our great cities, the mortality of children is something frightful, something frightful. Now, just look on at a few other things.

Notice the effects of a low protein diet on the blood of chronic invalids. One of the errors abroad in the world is the idea that meat is necessary to make blood, that we can have good red blood without rare beefsteaks. I remember very well some twenty-five years ago in England, I was spending a little time with a great surgeon over there, and twice a week, Thursdays and Mondays, he had a dispensary clinic, and spent an hour in a dyspeptic dispensary, and the poor people came along for consultation and he examined them and

prescribed for them. And a girl came along one day about sixteen years old looking as pale as a piece of white sheeting, pale as possible, skin was absolutely white, and her lips where white. The poor girl looked as though she had hardly a drop of blood in her body, and he said, "I told you to eat more meat. Why don't you eat more meat?" "Why, Doctor, I don't eat anything else; I haven't eaten anything but meat for three months." She said, "I have followed your prescription." "Well, you must eat more meat, eat more meat." And he sent her along." That poor girl was dying from meat poisoning that very minute, suffering from evidences of intoxication, and the blood was being destroyed by poisons formed in the intestines and absorbed into the blood.

Now, to demonstrate the folly of this idea that meat is necessary to make the blood what it ought to be, I have had some statistics gathered together. A thousand consecutive cases. Everybody who comes here has the blood tested when they come, and I had a thousand cases of persons who had the blood tested when they came added up together, and the average obtained which was found to be 3,885,000. Then when they came to go away the test was made again, and the average was 4,359,000. That was a ~~xxxx~~ subsequent test. And some of them got so much better they didn't care to have the test made the second time, and didn't take it, so we probably do not get credit for all the improvement there was. It is the people who are not getting better that are certain to have the second test. Those who felt all right slipped off without taking the second test; didn't care to take the test for the sake of helping our records. I remember what Mrs. McDowell, who has charge of the University settlement in Chicag, said to me one day. She said, she started a prayer meeting, and she could not get anybody to come to the prayer meeting; they kept dropping, dropping, dropping off, and by and by she started a mother's meeting, and more people came to that than would come to the prayer meeting, and she said, "I found out after while that the

people would not come to the prayer meeting because they thought they were going to be counted when they came to the prayer meeting so as to have a report made, and that I was holding that prayer meeting and got my salary based upon the number of people who came to the prayer meeting; so they would not come to be counted; but they came to the mothers' meeting to be helped, and she had a very good time with them. Now, you see the hemoglobin went up fifteen per cent, and in thirty cases, of very bad anemia, in which the average was only 1,989,000, less than two fifths of what it ought to be, the gain was up to 3,140,000, a gain of 58% on an absolutely meatless diet, absolutely no meat at all. And the hemoglobin gained in these thirty cases of anemia over 40%, 47%, a gain of 20%, or 50% of what it was at the start. Then we made another test. We had an examination made of our helpers, people who had been living on a low protein diet for a long time, and that had no meat. We never served meat on our helpers' tables here. For forty years this institution has carried on its work without giving its employees meat. We never serve meat at the employees' tables. It is 45 years now, this next summer, since this institution was opened, and meat has been excluded always from the daily table, and we found the percentage was of men, the hemoglobin, that is coloring matter, was 97, and in women 96%; the red cells, 4,700,000, and in the women 4,250,000, that being considered practically normal. Down in New York city the doctors call 85% normal for a New Yorker, because the New Yorkers ~~were~~ are nearly all suffering from New Yorkitis you know, of which anemia is one of the symptoms. The blood pressure is found to be fallen down. The blood pressure was found to be, of the men, 133, and of the women 119, which is certainly ample, high enough. It was taken with what we call the narrow arm band, and the blood pressure taken here now, at the present time, would have been about twenty points lower.

We spend millions to protect a man against a disease which another man has, and may give him, but not a penny to save him from maladies which unknowingly

he may give to himself. Did you ever think of it? The chronic maladies that brought you here you didn't catch from anybody. We spend millions of dollars to keep away typhoid fever, to keep away scarlet fever, measles, and things of that sort; but how much money is spent by the government, or by the municipalities, by cities to keep away Bright's disease, to keep away cirrhosis of the liver, apoplexy, arteriosclerosis--and those other horrible maladies that are killing more people, far more people than typhoid fever, or ~~any~~ all of the other infectious diseases put together--just look at these maladies, how they are carrying us off. In the last ten years there have been killed by degenerative diseases between 1900 and 1909, 2,882,000 people in the United States by such diseases as arteriosclerosis, apoplexy, and Bright's disease. Now, tuberculosis carried off in the same time 1,343,000. In the next ten years, at the rate these chronic maladies are increasing, tuberculosis will kill 1,462,000, while of degenerative disorders, you see, in the ten years to come, the number that is going to be destroyed will be 4,167,000--nearly double the number that was destroyed, three fifths more, sixty per cent more than was destroyed in the last ten years. And pneumonia, almost a million people have died of pneumonia in the last ten years, and in the next ten years, there won't be quite so many, because we are gaining a little ground on that. Cancer is increasing. Five hundred thousand people died of cancer in the last ten years; and 866,000 will die of it at the present rate in the next ten years. Typhoid fever is standing still. See the vast number that died from degenerative disorders as compared with the number that die from infectious disorders. Here is another statement about it.

One tenth of all the people who die of cancer die between the ages of
 fifty
 forty and ~~six~~ years. One tenth of all who die between the ages of forty and
 fifty die of cancer. Half of all who die of cancer die between the ages of
 fifty

fifty and seventy. One sixty--I looked it up the other day, and I was very much surprised to find that in the United States one sixth of all the people who die between the ages of forty and fifty, one sixth of all the women who die between the ages of forty and sixty die of cancer, and in the city of Chicago in the last ten years, one fourth of all the Germans who died, one fourth of all the people born in Germany and living in the United States, one fourth of all who die in Chicago of German birth died of cancer. Not one fourth of the women, but one fourth of all the Germans who died died of cancer. That is an awful thing to think of--that one sixth to one seventh of all the women over forty years of age who die are going to die of cancer. That is what happened in the year 1909, and doubtless as it was in 1910; and the proportion is increasing all the while. Go back twenty-five years ago and only half as many men died of cancer; but at the present time, two thirds as many of the men die of cancer; and down in Australia, the number of men dying of cancer is increasing at such a rate that in a very short time as many men as women will die of cancer; and in some places it has already gone the other way--more men than women are dying of that disease.

Thirty-five per cent of all the persons who die of consumption die between the ages of twenty and thirty-five. Sixty per cent of those who die of tuberculosis, die between the ages of twenty and fifty. Tuberculosis is a disease of early life; cancer is a disease of old ages, at any rate, over forty.

"If we price each life lost at only \$1700, and each man's average earning for the year at only \$700, the economic gain to be obtained from preventing postponable sickness, measured in dollars exceeds one and a half billion dollars a year." That statement is made by Prof. Irving Fisher, head of the political science department of Yale University, a man who has a great reputation the whole world over as a professor of economics. Just think of that loss--one and a half billions of dollars. We could pay off the national debt in one year, the great national debt could be easily paid in one year if

we simply saved the lives of persons who die from postponable sickness in one year. See how diseases are increasing. Heart disease in 1900 was 111; in 1907, was 141. That is the number of deaths in every hundred thousand. Think of what a terrible slaughter that is. 111 people in every 100,000. That is more than one in a thousand, you see, and in 1907, it had gone up to 141, an increase of 27%. Bright's disease increased 18% in that seven years; apoplexy 11 per cent, cancer 15.8 per cent; cirrhosis of the liver 22.4%, diabetes 43%, appendicitis 15% in spite of all the lives the surgeons have saved, in addition to that; congenital debility 98%; endocarditis 20%. So you see we are going down very fast with these chronic diseases. We are not gaining as much ground in saving life by acute disease as we are losing in saving life by chronic diseases.

"Both medical and statistical evidence of strongest character forces the belief that lowered vital resistance, which invites pneumonia, kidney disease, heart disease, etc., accounts for the facility with which cancer invades our modern human economy.

This is to be noted, that it is only in flesh eating countries where cancer is increasing. It is only in countries where flesh eating is combined with the sedentary life, where cancer is increasing. Lions and wolves do not suffer from cancer when in the wild state; but in cages they die of cancer. Cats and dogs in our homes, dining at the same table at which we eat, or beside the same table, or upon the same food, as they usually do, die of cancer, and in larger proportion even than human beings. The oldcat or the old dog finally loses its appetite, begins to look forlorn is taken off and shot somewhere. We don't have a post mortem examination to see what is the matter with it; but if we did, we would find it had cancer of the stomach, or cancer of the liver, or some other awful malady. Cancer of the breast is a very common disease, and it is particularly common in dogs. It is very common in humanbeings, most common among women, but it is the same thing that occurs among dogs very commonly.

Eight per cent of all the dogs that are sick have cancer, and seven per cent of all the cats have cancer, and five per cent of human beings. Dogs and cats are more subject to cancer than human beings are because they are more carnivorous in their habits, and perhaps are more sedentary in their habits; that is, domestic cats and domestic dogs.

Well, then there is the smoking habit. How common it is, how almost universal it is. The average American uses eight pounds of tobacco every year. The average per capita consumption of tobacco is eight pounds, and it is increasing. The tobacco journal says the use of tobacco is increasing. It is a shame to us that we should become so addicted to this savage, barbarous habit, so fixed in it. Tests were made at Yale upon students, and it was found the weight was diminished in students who used tobacco one year or two years; it was found that the youngmen smokers gained less than those who did not smoke; that the non-smokers gained twenty per cent more in weight than the smokers, and twenty-seven per cent more in height than the smokers, twenty-four per cent more in weight and 27% more in height, and forty-two per cent more in chest girth, and 75% more in lung capacity. They all had gymnastic exercises, gymnasium advantages, but just think what that means--the boys that were smoking were far behind the boys that did not smoke in chest capacity,--75% increase in chest capacity means that much increase in vitality, vigor, stamina, endurance, in efficiency. Now, a study of the blood pressure shows very clearly that there is a great difference. Suppose the normal pressure to be 105. A person living on a high proteid diet, when he gets to be about forty or fifty years of age, will have a blood pressure of 160. He comes to the Sanitarium with blood pressure of 160, drops off his beefsteak, and it comes straight down in a couple of weeks to 140, and if he keeps on with the rational diet, it will come down still further; but if he doesn't reform, and should happen to drop in here, or should find some

intelligent doctor who knew what was the matter with him and gave him friendly, rational advice--keeps right on with his beefsteak and his tea and coffee, the blood pressure will keep on climbing until it gets up to 300, and he can not go much farther than that. I have known of a few cases of 320. We have had several cases here of 310, but when he gets up so high as that there is going to be an explosion pretty soon; it is not going to go much higher than that. Something is going to break. He can not keep up that tension. The arteries are diseased because this blood pressure is increasing in height.

From 1901 to 1907 the annual average number of deaths in the United States--the total number of deaths was 3066. In 1905 it was 4000, and in 1909 it was 10,174. Just see how it is coming up. It more than doubled in five years., the mortality from that one disease. And the study of the death rate shows that the death rate from this disease has increased 300% in ten years. It was 6.1 to the 100,000 in 1900; and in the year 1909, it was 20 to the 100,000, which means an increase of more than 300%. If it keeps on increasing at that rate, you see what we are coming to. We find people now with high blood pressure, as high as it ought to be at 150 years, at twenty. We have several people in this house now, right at this minute, people only 40, or 41, or 42 years of age who have a blood pressure of 200. In some cases this is a hereditary tendency that is rather hard to combat.

See how heart disease has increased. In five years, from forty thousand deaths in one year to 65,000; angina pectoris, a disease of the heart, from two thousand in 1905 has gone up to 3,481 in 1909. Now, there is some cause for this terrific increase, and one cause is our wrong diet. One reason why we have this degeneracy of the arteries is because we live upon an unnatural diet, upon a diet of flesh. That is not our natural diet. One of the proofs that flesh food is not our natural dietary is the fact that it is an unbalanced dietary.

tary. For example, when you come to consider the amount of lime found present in foodstuffs,--we need thirteen grains of lime per diem, to support our bones, and our brains, and the various tissues of the body. The lime requirement is thirteen grains every day. Now, we find in eggs four grains to the pound; in one egg half a grain. Now, we find in cow's milk, in a pound, fourteen grains, and in a pound of human milk three grains; in a pound of meat only half a grain of lime. There is as much lime in one egg as there is in a whole pound of meat. A potato has one seventh--has almost no lime. In wheat we have it, four grains; but in fine flour only one grain. Only twice as much in fine flour as in meat. The lime is removed with the bran, you see, while in peas and beans we have eight grains of lime to the pound. In a pound of protose, there is six grains of lime. Protose is prepared from nuts and from the gluten of wheat which contains the principal part of the lime; so we have in a pound of protose ^{six} ~~nine~~ grains of lime, twice as much as in one pound of meat. One reason why protose is a better food than meat is because it contains the proper lime content. So we know from this fact that meat can not be a wholesome food. It is not a complete food. When one lives on a diet of meat, his bones necessarily become softened, and he gets ricketts, ~~and~~ because of the lack of lime. That is the reason why the lions' cubs in the great zoological garden of London became decrepit, infirm, and ricketty when they were fed on meat, and the reason was found to be because they ate the meat without the bones. When they were fed upon bone meal in addition to the lean meat, they got along all right. So if you are going to eat beefsteak, mutton chops, ham, bacon and things of that sort, you must have on the table some ground bone to sprinkle in along with that meat, so you will get the lime, because when the hog eats the corn, the lime goes into his bones, and the only way in the world you can get that lime back, which was originally in the corn, and have the complete nutriment--the only way you can get the lime back

back is to eat the whole hog, bones and all, the whole hog or none if you are going to eat meat.

Increase in mortality after forty years. That is the thing that is alarming the life insurance societies. They are getting thoroughly waked up about it, getting scared, for they are afraid they are going bankrupt because the mortality is increasing so rapidly from arteriosclerosis and these other old age diseases. A life insurance president, Mr. Rittenhouse, not long ago made a statement of the subject, and he showed that the mortality between forty and fifty years has increased thirty-five per cent in 28 years. Now think of it--an increase of more than one third in 28 years. Those of us who are between forty and fifty years of age--that does not include me,--but those that are between forty and fifty years of age,--men and women have only two thirds as good a chance to live as they had thirty years ago. Those between fifty and sixty have only ~~four~~ four fifths as good a chance, and those who are between sixty and seventy which includes me, have only got three fourths as good a chance. So you see, my friends, this is a question that comes right home to us. What is the reason the mortality of these persons over forty years of age has increased so enormously? It is the cumulative effect of the luxurious methods of living, the habits of life that we have gotten into within the last forty or fifty years. We are suffering the cumulative effect of the wrong doing of our ancestors. You know Oliver Wendell Holmes says that every one of us is an omnibus in which rides all his ancestors. We have got so many gormandizers, smokers, tea drinkers whiskey drinkers in our omnibusses that they keep putting out their heads. That is where the difficulty is.

The consumption of meat per capita in the United States is 182 pounds of beef; mutton and pork, 60 pounds, ~~including~~ fish and poultry 50 pounds. Add them together, and you see it is 224 pounds, and that means two thirds of

a pound of meat, or fish, or flesh, or fowl for every person in the whole United States daily. The per capita consumption per diem of meat is about two thirds of a pound; and we find we use about a quarter of a pound of sugar per day; 83 or 84 pounds per capita per annum. Figure up the food value of the meat and of the sugar, and we find it amounts to somewhere about 1500 or 1600 to 1800 calories. 40 for the sugar, and about 1100 or 1200 for the meat; so that we have somewhere about 1700 or 1800 calories of food value in meat and cane sugar, and practically not a grain of lime in it. Now, we have to have thirteen grains of lime, and two thirds of our food contains no lime at all. So you see we are bound to suffer from lime starvation. That is why we are losing our teeth. If we keep on at the rate we are going, we will be a toothless race before five centuries have gone by, will be absolutely a toothless race. We are losing the wisdom teeth already; they do not come up now until we are about twenty years old, and make a whole lot of business for the dentist and trouble for us when they do come. The wisdom tooth has pretty nearly disappeared at any rate, and is bound to disappear ultimately. It has been suggested that the gold mines of the future will be found in the cemeteries. Some of you know from experience where a whole lot of that gold has gone to. It is astonishing how much that gold costs that goes into our teeth.

One of the reasons for this degeneracy is wrong dress for which the women are responsible. We have got the X ray now, so we can look right through every woman's clothes and see exactly how she looks inside of her clothes--right through, and we do not always require the X ray for that, but it ought to. Here you see the skeleton of the healthy woman. This is one of a woman with an ordinary dress, when the woman is dressed up; you can not tell anything about how she looks inside; the appearance outside may be very beautiful and artistic and lovely, but just apply the X ray, and you see how things really are. Not

so very long ago a case was examined here by the X ray, and the ribs actually overlapped in front. Just compare these two figures. That is not an extraordinary figure. That is just about, I think we will say, a la mode. Well, I want to tell you when we come to look closely at the human figure, we get a pretty definite idea of how it looks, and I am going to show you one of these days a picture made by the X ray, of the ordinary woman, so as to have positive proof of it, then there won't be anybody who can smile at it.

That woman has plenty of room, you see, and she is not ashamed to have a good sized waist. There is no reason why a woman should have a little waist. A woman has got less heart and more liver than a man has. Her liver is bigger than a man's, and she needs a larger waist to take care of it, to make room for it. It is an actual fact that woman has a liver larger in proportion to her height, and larger in proportion to her weight than man has. She has a larger stomach, larger kidneys, and a larger spleen and larger colon--all these internal organs are larger, the viscera are larger in proportion to the woman's size than in man. There is a good reason for it. Woman's liver has to do work for two sometimes. It is the provision for motherhood, and there is nothing dishonorable about it. A woman's waist is necessarily larger than a man's waist, of the same height, the same size, necessarily larger. Her shoulders are smaller, her hips are larger, her waist is larger for physiologic reasons; and there is absolutely no sense, it is indeed a positive species of insanity that women should want to have small waists. Here is a picture of a manly man, an outline of the figure of a healthy man. You see the shoulders are larger than the waist, and the hips are comparatively small in relation to the shoulders, and the bones; he has a good strong figure.

Now, there is a woman who has a normal figure, and an artistic figure. There is no artist who would presume to excel the beauty of the Venus de Milo.

It is put forward as the very acme of grace and beauty in womanly form. Here you see is one of the caricatures of the fashion makers. You have seen things just like that in fashion plates, and I have seen them on the street. I have seen a lot of them in the examining room, and I know how they look inside. No provision has been made for that woman's stomach at all. There has been no provision made for her liver. She was apparently entirely oblivious to the fact that she had a liver, or that there is any ~~ixixix~~ necessity for making provision for anything inside. There is another copied from a fashion plate. That is a caricature that I got for the purpose, or had it photographed from a fashion plate, just exactly what I found. And this is the Venus de Milo again. Now, over here you see the outlines of the human figure showing the internal organs as they are in a state of health, where they lie. The liver is above the ribs, you see, entirely. It is perfectly safe, up in a bony cage, above the lower border of the ribs, the lower border of the liver coming a half inch above the lower border of the ribs. Here is the stomach entirely above the ribs also, and the colon comes just above the border of the ribs. The kidneys are up behind the ribs, and the spleen is up behind the ribs. They are all protected, these great important, vital viscera are all protected within this bony cage. Here is a little figure on the other side. This is a normal woman. This is copied from Ziemssen's great work on anatomy. It is not a diagram that has been gotten up for any specific purpose. This is also a copy from nature. This was drawn from a woman that wore a health corset--an invention of the devil; and she declared she never had worn anything else but a health corset, and because it was a health corset, she knew it must be all right; but her liver was away down here, and her stomach was away down there. Just look at it. In the normal figure you see here, the liver, stomach, pancreas, spleen, kidneys, colon are all above this horizontal line drawn from the lower ribs of one side to the lower-

most ribs of the other side. The other picture--the abnormal chest, deformed by wrong dress--half the liver is below the line of the stomach, almost entirely below the line; the kidneys are away down below the line. They are wandering around as poor tramps, and the spleen is wandering around somewhere out of sight; and down behind the stomach out of sight somewhere is the pancreas. All the viscera are out of position.

Here, you see is a contrast. Here is a picture of grace and beauty in which there isn't any tight lacing, or any necessity for it. It is purely a ridiculous fancy, a morbid ideal that has been created in women's minds that beauty requires a small waist. You see here these graceful, flowing lines that are certainly in no way inferior in beauty to the caricatures we sometimes see when the waist is constricted.

Now, there are other things. Here is a point I want to call your attention to--the importance of proper position. People get their internal organs out of place not only by wrong dress, but by wrong positions in sitting and working and standing and walking. Stand with the shoulders drooping and the chin hanging forward--that is what we find here. You see this man at work all doubled over. They get tired after while, because the abdominal muscles relax and the blood runs away into the abdomen, and the blood they want in their arms and feet, in their muscles for work, is accumulating in the interior of the body where it does them no good. This man is standing up straight, and his muscles are tense, the abdominal region is compressed and the blood is forced out into the arms and limbs, and various parts of the body where it can be used, instead of being stored up in a stagnant pool inside the abdomen. So those men will retain their energy and vim and endurance when the others are exhausted entirely. Here is another man sawing wood, one man in the correct position, and another man in an uncorrect position. This man will get tired in a little while because

he has not enough blood to keep his arms going. The other man has strongly contracted abdominal muscles, you see, and there is room under his vest; and this man's vest is tight, because the blood is accumulating down in that region of his body. The same thing is true with reference to sitting. You get tired very quickly when sitting relaxed in this manner. When sitting properly in a Sanitarium chair with the chest raised, breathing is easy the position is comfortable, is restful, and the blood is circulating throughout the body where it is needed. This poor woman has got in the habit of carrying her chest behind you see, instead of in front; and you see what a caricature it is--just sticking away out behind. The chest belongs in front, not behind. Here is another view--a man sitting in a relaxed position, his back lies against the chair all the way along, and it is a straight backed chair, and the consequence is the chest is flat and the back is bulging out behind so the chest is sticking out in the rear. This man sitting up straight, his chest is in front where it belongs; but he has no support for the back, and he soon gets tired. He ought to have a little cushion in there. Here is a man who has a little support for the center of the back. The muscles get tired, and if he hasn't any support, down he goes. He naturally gets round shouldered. He wants to straighten up; so he must back up against the wall, place his hips against the wall, shoulders against the wall, heels against the wall, and head against the wall. Here it is, right here, you see. Then he bends the head back like this, and that brings him up in position, so the body is free from the wall and the shoulders, and he has got the correct position, with the chest well projected forward. If you haven't any gymnasium, you can use the wall. Heels, hips, shoulders and head should rest against the wall; bend the head back and that will lift the chest forward, and there you are, in a good, normal position.

See these caricatures of human figures. They are drawn from life.

I have a little machine I devised some years ago. A person stands up against a flat surface, and I have a little sketching instrument by means of which I can sketch it right upon the paper by drawing it right down in black and white. That is what I found. Here is a man came to the Sanitarium years ago with his stomach out of place, and his liver out of place, and he was in a miserable state, and I didn't know what we could do for him. We didn't do very much for him, and he went away, and afterwards came back again, and when he came back I made him stand up straight and put his hands under his shoulders, and he simply had to have the tailor make another vest for him. His belt was several inches too big; he diminished two inches in diameter as soon as he stood up straight. It pulled his stomach and liver up, don't you see, so there was more room below, and he found himself at once lifted up in his feelings; his depression disappeared, his nervousness disappeared, and he felt like another man, full of energy and life, and he was a Boston business man. I met him three years afterwards, and he said, "Doctor, you taught me how to stand and sit, and that was all I needed; I have been perfectly well since."

I examined this woman, thought she had a tumor, and I said she would have to have an operation. The next time I found the tumor on the other side of the body, and I began to inquire a little more closely, and I found she had had when she was a girl a lump in her side. She had an attack of fever and ague, and when she got over it, she had ague cake. At boarding school she asked a young lady friend, "What shall I do to reduce my waist?" She said, "I will tell you what I did. I wore my corset nights, took it up a little every night and every morning, and by and by I got my waist down and I have kept it down since." She said, "I tried it, and after about six weeks, one morning when I was ~~raising~~ taking it up another notch, I felt something pop, and my waist went down, and it has been down ever since"; and not only her waist was down, but her spleen was

down and had been wandering around everywhere. This poor woman never got well with that large, wandering spleen. This woman had a prolapsed stomach and colon, and that was the shape in which I found things, instead of being away up under the ribs where they belonged. The kidneys had become so diseased I had to remove one of them, and I took out a stone from the inside of it that weighed four ounces as the result of bad position in sitting and abnormal postures. It is a very common thing.

Now, see here the normal form of the healthy woman, and that is the conventional woman. That is the form that results from tight bands, heavy skirts, tight lacing, from relaxed sitting; that is the figure the woman gets. A poor, weak, feeble woman who had that figure, after training got this figure, and was a new woman, became strong, healthy, vigorous, and learned something of what it means to enjoy life, and became really athletic. It only needed the correction of a wrong standing position. Here is another woman who wore a health waist, which broke down the center of the body, and here is a great bulge down here, and that is a front view of the same figure. Here is another broken down figure. You see the muscles in front are weakened, and the whole body is broken down, by this bulging out of the lower abdomen which means the stomach, liver, kidneys and other organs are down out of place; it can not mean anything else. It is simply the result of displacement of the internal parts. That is the figure of a ~~xxxxxxx~~ woman when she came here about twenty-five years ago; everything was tumbled down here in the lower part of the abdomen; we got her straightened up, and that is the way she looked when she straightened up; she was a new woman altogether. She became a teacher of gymnastics and enjoyed splendid health, and became a vigorous, healthy young woman. She was a broken down school teacher.

Now, you see this woman carries the chest in front where it belongs, while the other woman carries her chest behind; ~~xxxxx~~ the dressmaker puts on some-

thing in front and something else behind to balance things up. That is the only way the thing can be done. We have to have a whole lot of appendages to piece out the caricatures that result from wrong attitudes, from neglect of proper standing.

Now, because of these various neglects, and many more,--because of them we are degenerating, and we have got to turn about and cultivate health instead of disease. I showed you how many people died of heart disease, of angina pectoris, and one reason for it is because these little arteries that feed the heart become hard and chalky, so the heart can not get its proper supply of blood. Sometimes there is a spasm in these arteries, then the heart labors under very great disadvantage. There are palpitations, weakness, and failure. Tobacco weakens this splendid muscle that pumps the blood around in different parts of the body, sending out through this little pipe here, the aorta, the living tube of the blood in the body--all the blood in the body is sent through that tube every three minutes. The heart does work equivalent to lifting 124 tons every day of our lives, 124 tons' work is done by that little muscle, the heart. So you see how important it is we should keep it up to its maximum capacity. Suppose you paralyze it with nicotine, weaken it with tea, or coffee, damage it with arteriosclerosis, and the use of beefsteak, and by neglect of proper attention to the bowels so the absorption of these poisons from intestinal auto-intoxication produces arteriosclerosis; we have degeneracy of these arteries. Suppose we mistreat the heart in this way; then it fails early, and that is why we have so many thousands of people dying, increasing thousands of people dying every year from heart disease. It is because we cultivate heart disease. The heart is to circulate the blood. The normal blood examined under the microscope shows these wonderful figures in it. The wonderful white cells, the leucocytes, which render most wonderful service in capturing germs, defending the body,

eating up fragments found loose in the blood stream that might clog it up. Some of them work as germdestroyers. When we neglect our diet, smoke tobacco, use alcohol, tea, coffee, use putrefying foodstuffs that decay in the colon and flood the blood with poisons, then these wonderful cells, these little living creatures in the blood that render such marvelous service, degenerate and by and by die. They undergo deterioration of various sorts.

Here is another picture of a normal cell, showing things they are able to do for us when they are healthy and normal, but when they become diseased they are no longer able to do. Here is a picture showing how they are defending us against germs. The white cells work their way out through the walls, capture the germs and so defend the body. Now, they deteriorate when we subject ourselves to unwholesome conditions, to impure air of unventilated rooms, to sedentary life, neglecting to exercise, to unwholesome diet, the use of vinegar pickles, mustard, pepper, peppersauce and these other unwholesome things which circulating in the blood paralyse these little living cells, so they are not able to do their work; and that results in lowered resistance to disease. That is what low vitality means. That is what disease means. It means simply deteriorated blood because, as the old prophet said, the life is in the blood; the life is in the blood, and if we reduce the blood we reduce the life. A person whose blood is fifty percent has only fifty per cent of the life he ought to have, has only fifty per cent of the vitality he ought to have; in fact, less than that.

One of the things essential to a high quality of the blood is activity of the kidneys. One of the things that is very much neglected is the habit of drinking. The average man does not drink enough of Adam's ale. He takes whiskey, beer and things of that sort, but does not take ~~xxxxxx~~ enough of good old Adam's ale. People sometimes ask me the question, "Doctor, what kind of blood

purifiers do you recommend?" There is only one blood purifier in the world that I would use. Water is the only thing that can wash the blood clean, water, and pure air, and the water purifies the blood by washing the poisons out through the kidneys which are the natural outlet for poisons. That is their function--to remove poisons from the blood by the aid of water. The poisons must be dissolved by water. When you find you have a minute, get a drink of water. It will help you out of a cold quicker than anything else. Make up your mind, if you have a cold, you will drink a glassful of water every half hour all day, and you will be surprised how quickly you get over it. Take a couple of glasses before breakfast. Then take your breakfast of water. Take a glassful every half hour till dinner time, then sit down and have a couple of nice glasses of hot water for dinner. Then try another glassful every half hour between meals, and some more hot water for supper, and see how quickly you will get over that cold. The old adage to stuff a cold and starve a fever is simply ridiculous, because a cold is fever; it is a fever in which the body is saturated with poisons and has ceased to eliminate or destroy those poisons as it ought to do. That is what a cold is. By drinking large quantities of water we may rinse the cold out by carrying off the poisons which produce it.

The very same thing is true with reference to arteriosclerosis. If you have got high blood pressure, drink water to rinse the poisons out that produce it. If you have got a dingy skin, free drinking of water will rinse out those poisons and help carry them away. Make a practice of drinking, make it a duty, just as you do the washing of your hands. If your hands are dirty, you wash them with water. If your blood is dirty and the skin is tawny, and the complexion is bad, there is no way to clear them out but by washing out with water. Everybody ought to drink ten or twelve to twenty glasses of water a day, and if you do, you will find yourself coming up a great deal faster than you did.

Some can drink water when it is hot much more easily than when it is cold.

This shows the filtering arrangement of the kidney. The ^{water} ~~excess~~ comes out through the blood vessels, passes through these tubes, and washes out the poisons accumulating here, and that is the method of purifying the blood. When the circulation is not carried on properly, the kidneys themselves are destroyed by poisons, saturated with these poisons, paralyzed by them as the result of the supersaturation of the blood; so the more water we drink, the more the secretion of the kidneys is diluted, and the less irritating the poisons are. These evil practices that have accumulated during the ages, which are cultivating disease instead of health, are producing effects upon our bodies which are hereditary. We may lose a finger or an arm, but the man's son is not born minus an arm or a finger; but if he injures his body with alcohol, tobacco, or germanizing, neglects of any sort, so that every single cell of his body is deteriorated, not simply a finger is gone, but every cell of his body has lost something of the original vitality and vigor which it possessed, that is hereditary.

Here is a picture of the law of heredity. A black eyed ~~man~~ man marries a blue eyed woman, and they have four children all of whom have brown eyes. Black eyes and blue eyes make brown eyes. That is the law. Here is a point I want to call your attention to, and that is that those black eyes are not the only thing that is inherited. Those black eyes seem to stand for a certain type of body, and along with those black eyes go other constitutional tendencies besides the tendency to black eyes. Now, with those black eyes will go, for instance, a rheumatic disposition, if the man has rheumatism. Rheumatism is not a disease of the joints alone. It is not a disease of the knees or elbows. Rheumatism is a disease which affects every single cell of the body. When a man has got rheumatic joints, there is something wrong with every single cell of the body. There is not a part of his body that is thoroughly healthy. He

has got rheumatism everywhere. So that black-eyed man has rheumatism, and this black-eyed boy, a grandson of his has got rheumatism too. He has got just what the black-eyed grandfather had. And if the blue-eyed grandmother had hysterics, the blue-eyed granddaughter will have hysterics, or nervousness or some other form of degeneracy of the nervous system. So you see this is a question of tremendous consequence. This question of heredity of diseases, or predisposition to diseases is inherited. Here we see a rheumatic man married a woman subject to pneumonia, and you see how the two stems are joined. Here was a case of uremic poisoning, or tuberculosis, and the son of this family had rheumatism, and a daughter ~~xxxx~~ of the other family had rheumatism, and the two joined, and they had three children all of whom had rheumatism. This is actual fact, not fancy. We see ^{that} ~~by~~ going on all about us. Diseases are multiplying through heredity, and that is why the race is degenerating so fast. We have got to turn around, to cultivate the opposite, cultivate health. The time will come when young men and women will take seriously into consideration the question of health before they marry. A young woman won't think of consenting to marry a young man that has not a good strong healthy, vigorous body; she won't marry him simply for the pleasure of becoming his nurse to take care of him, she won't care to do that; she will have her eyes open. She must take into account the sort of children that are coming ~~axx~~ as the result of that kind of a combination. The young man will be inquiring about the health of the young woman, about the antecedents. The young woman will want to know whether the young man has good blood or not. There will be an aristocracy of health some time, when it will be a prouder thing for a man to say that his father and his grandfather and his great great grandfather were without any sort of infection, of blood infection, they had a clean history, no hereditary disease in his line, than to be descended from some duke that perhaps had a blot upon his brain away over in the old country somewhere. See what happened here. An imbecile man

married an insane woman. Nobody but an idiot would do such a thing as that. They had five children. One was a lunatic, the others were all idiots or imbeciles. That is the result of that kind of combination. The imbecile man died, and the insane woman found another imbecile man that was willing to marry her, and they had ~~ixres~~ eight children, all imbeciles. That is why the idiot population is increasing. We have about 150,000 idiots that are known at the present time, and probably twice as many more that are not public charges in the United States at the present time. There are 150,000 insane people shut up in the insane asylums, and twice as many more loose that haven't been caught yet. That is the way we are going. We have unquestionably at least 600,000 defective people in the United States at the present time, and heredity is increasing every day, so it is time, my friends, that we awakened to this thing and began to stir ourselves and seek to cultivate health, to use prophylaxis against this awful tidal wave of degeneracy that is rolling in upon us. That is the reason why this institution exists--to stand up here as a protest against the prevailing usages of society, and to establish here a sort of sanitary heaven where people can come and learn to be good to their bodies. That is a thing that we haven't always thought about. "Whatsoever a man soweth, that shall he also reap." "The wages of sin is death." That is not modern language; these are old sayings. If we are sick, it is because we have cultivated sickness. If we are well, it is because we have cultivated health. It is a great thing to be started right. ~~Esse~~ is a baby that is started right. Probably most of us have had just as good a start, but we have done what we ~~havex~~ could to get away from it. Let us determine to cultivate health, to live to be healthy instead of sickly, live for health, study God's laws and obey them. I thank you for your attention.

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May 15, 1911.

Sunlight-Fresh air I.

Cocoa I,2. Tea and Coffee 2.

Beef extract 2,3. (Dr. Austin Flint)

Sun, energy from 5,6,7.

Animals are eaters, not eatables 7.

Animals are beings, not things 8.

Turtles' hearts. (Key West experience) 8,9.

"The very hides began to creep" 9.

Cannibals and human steaks-"Long pig" 10.

Sailor tasted like tobacco 10.

Odor of pigs fed on flesh 10.

Man fed on pig 10,11.

Flesh-eating polluting to body 11.

Bowel discharges of herbivorous and carnivorous animals 11.

Brown circles under eyes, bad breath 12.

Pigs, chickens, turkey buzzards, enormous livers of 13.

Turkey, roast, 13-14.

" " Stuffing a corpse-Old savage still in us 14.

Diabetes-Flesh-eating 15.

Experiments upon thyroid gland (Dr. Curtiss of Johns Hopkins) 15.

Diabetes, starch in 16.

Neuritis, symptoms and causes 16.

✓ Steaks, laundered 16,17.

✓ Arteriosclerosis-a fire of the house 17,18.

Old arteries-Old age 17,18.

Stopping advance of arteriosclerosis:

Cigars, tea, coffee 20-Caffeine 21-Beefsteak, Lowering blood pressure
21,22.

Arteriosclerosis, diet in 22.

" among longshoremen-large meat-eaters 23.

Vinegar 22.

Thomas Parr at I52 -no hard arteries 23.

Yogurt-Milk 24.

Rhubarb 24,25.

Swimming 25.

Neurasthenia an artificial disease 25,26.

Getting rid of the old man 27,28.

A man getting well is like a man deep down in the water 28.

Autointoxication (Prof. Tissier's view) 28.

Hot and cold feeling after meals 28,29.

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chemicals to destroy the poisons of meat 16.

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cocoa 1

diabetes 15.

flesh eating 5.

meat, chemicals to destroy poisons of 16.

✓neurasthenia 25.

poisons of meat 16.

spine inflamed 3.

swimming after exercise 25.

Spine-inflamed 3
shuts 5
fish eating 5
diabetes 15
chemicals to destroy
poisons of meat 16
arterial sclerosis 17

QUESTION BOX LECTURE

At the Sanitarium Parlor, Battle Creek, Mich., Monday, May 15, 1911, at 8 P. M.

By,

J. H. Kellogg, M. D.

22-23

I hope you are all getting out of doors on these nice, warm, sunshiny days. Nature is after all the best doctor. There is more healing power outdoors than there is indoors, a good deal. We are naturally outdoor animals. Thousands of people are getting well from consumption, one of the most dreadful of maladies, - thousands of people are getting well today just by living outdoors. If a man can get well of tuberculosis of the lungs by outdoor living, he ought to get well of almost anything else. Almost any disease must be curable by this method if this terrible malady is curable by the outdoor life. So many people stay indoors too much; we get the indoor habit; we are brought up indoors, and we forget the great benefit there is by simply outdoor exposure. The sunlight and the fresh air coming in contact with our faces and hands, exercise, or movement, are all of great value as curative agents. I find a few questions here as usual on Monday night.

Question: Is cocoa injurious?

Answer: Yes. Why? Because it contains poison. There is nothing wholesome in cocoa; there is nothing good in cocoa, there is nothing beneficial; it is simply a seed of a poisonous plant, or a poisonous seed of a tropical plant. The cocoa seed contains theobromin. Now, theobromin is ~~not~~ a poison. Seven grains of theobromin will make a cat very sick, and you know a cat has nine lives; and twenty grains of theobromin will make a man very sick. Theobromin is a poison. It affects the heart, affects the arteries, affects the liver, affects the kidneys, affects the blood vessels of the body, affects the nerves;

it is a poison allied to caffeine, and caffeine is a poison which is practically identical with uric acid; so theobromin the poison of cocoa, and caffeine the poison of tea and coffee, and uric acid are practically one and the same thing. Now, there wouldn't any of you like to take uric acid. I imagine you would not if you really knew what it was; and yet, a great many of you have taken it. Everybody who takes Armour's extract of beef is taking uric acid; everybody who likes chicken broth likes uric acid; everybody who is fond of beeftea is fond of a solution of uric acid. An eminent chemist said not long ago that he could not possibly tell by the art of his laboratory, he hasn't any means in his laboratory by which he could tell the difference between beeftea and urine except his nose. If he hadn't the sense of smell, take that away from him and he could not possibly tell the difference between urine and beeftea. Now, I am just telling you the plain facts about it. This chemist hasn't any chemical means by which he can tell the difference between a pint of urine and a pint of beeftea except by the smell of it. Now, that makes some of you wince. I am very glad to see it; because I hope you will remember that the next time you have somebody sick in your house, and you won't be feeding them with chicken broth and beeftea, and those abominable things. We don't allow them in this house. There never was a teaspoonful of beeftea in my surgical ward, or chicken broth, or anything of that sort; we don't allow it there. I should feel that I was doing something to kill my patients if I gave it to them; I should feel that I was doing nothing to help him, but was certainly doing him harm. An eminent French physician said that beeftea is simply a solution of poisons, a veritable solution of poisons, and that is the exact truth about it. It is not a modern discovery.)

Dr. Austin Flint, the grandfather of the present Prof. Flint, Jr., of New York,-- the father of the present Prof. Flint, Sr., of New York City, an eminent surgeon, a man I knew very well, for I was a private pupil with him in Bellevue Hospital,--

of New York City

Dr. Austin Flint more than thirty years ago had an analysis of beeftea made and he discovered that it was identical with urine. Why shouldn't it be? The urine is simply extract of tissues. The kidneys are filtered, the ~~in~~ blood washes the tissues, and the kidneys filter the blood and take out of the blood the extracts which it removed from the tissues, the waste matters. That is the duty of the kidneys; that ~~is~~ their business--is to extract the wastes, take out of the blood the waste substances which the blood washes out of the tissues. Now, then, the uric acid, the urine comes from the tissues, you see. It is simply extract of tissues. So if we take the tissues and express the tissues, express the juice from the tissues, wash the wastes, extracts in the tissues, do it mechanically, we are only doing what the body does by a vital process--simply getting the urine out of the tissues at first hand instead of allowing it to be washed out by the blood and then filtered out by the kidneys. So you see there is a good reason why beeftea and urine are the same thing; they come from the same source. The urine is washed out of the tissues by the blood, filtered out by the kidneys, and the beeftea is simply squeezed out by a mechanical process; it is all the same thing. So there is nothing wholesome in beeftea, or broths, or any of those things; they are absolutely innutritious; they are simply poisons, and beeftea, and China tea, and coffee, and cocoa,--these are all really off the same piece. They are all practically the same thing--simply different flavors. There is nothing good about them. We can eliminate them with ~~many~~ great ~~difficultly~~ benefit from the body.

Q. Are gymnastic exercises beneficial for a patient with an inflamed spine and pains the greater part of the time from the head down through the body?

A. No, a patient who has an inflamed spine should go to bed and stay there until the inflammation is subdued; but this patient who thinks he has an inflamed spine probably has not got an inflamed spine; it is not at all likely

his spine is inflamed. The probability is the trouble is on the other side of his back altogether. I met a lady the other day who had an awful spinal irritation, had such terrible pain she had had plasters and blisters, mustard plasters and all sorts of things applied to the spine, and they didn't do a bit of good; fomentations, electricity, arc light, and all sorts of things had been applied, and they did not do her any good, and she came to see me, and I touched my finger to a little point at the end of the sternum here and she flinched terribly, and she said, "If you do that again, I will punch you"; so I didn't do any more punching, but I made a little further careful examination, and I proved to this lady's entire satisfaction that the whole trouble she was suffering from was on that front side of her back instead of on the back side of her back as she supposed; and so it is with most of these so-called spinal irritations--they are on the front side of the back; it is the sympathetic nerve or nerve centers, the great lumbar ganglia which are situated at the umbilicus, and the solar plexus which is just under the lower end of the sternum and overlies part of the stomach--this is where the real soreness is; it is a congested state of the viscera, congested stomach and bowels, a congested portal circulation--that is the real cause, and the pain in the back is a reflex pain. Now, when a man comes and complains that he has got gallstones, and we want to examine him for gallstones, you know we examine his back. We make an examination under his ribs, it is true, but then we make an examination of his back, and right ~~sk~~ down here, about where the dorsal vertebrae join the lumbar vertebrae, there we find a tender point if that man has an inflamed gall-bladder. We find a sore spot in his back. It is a reflex pain, it is reflex tenderness, what is known as Mayo Robson's ~~si~~ sign of gallstones, or gall-bladder disease; so when a patient has pain between the shoulders, it does not mean pain in the spine, or disease in ~~thex~~ spine; it means generally a congested condition of the solar plexus, a congested stomach, very often hyperacidity is present. It may be a prolapsed

condition of the stomach and bowels and a congested state of the viscera which is the cause. Most of these pains in the back come from visceral congestion. Nearly all of them come from this cause; they very, very seldom mean disease of the spine.

Q. Which particular treatment in your bathroom will be most beneficial for such a case?

A. A fomentation on the stomach will be more likely to do the back more good than anything done to the back. That is, we must hit the front of the back instead of the back of it,--treat the front instead of the back.

Q. Why is not chicken a good food?

A. Well, now, I shall put another question to you which is exactly analogous. Why is not a stove good fuel? It is the same thing, the very same thing. Food is fuel. All food is produced by the earth. The energy, all energy, no matter how we use it or how we get it, all energy comes originally from the sun. The only ~~EXPER~~ exception to that is the energy of gravitation. That is very little used. The energy of the tidal waves--there is a little energy there from that source, but originally the energy comes from the sun. Now, see how it is. The sunlight shines on the green leaves, and the green leaves under the influence of the sunlight take the atoms of the earth and of the air and from the water, and organize these small molecules into large molecules. It is exactly like carrying a stone up on top of a tower. When you carry a stone up on top of a tower, you roll it off, and when it falls and strikes the earth there is a tremendous output of energy. The energy that comes from the falling of that stone, you put into it when you carried it up laboriously to the top of the tower. When you rolled it off and it struck the earth again, the same energy that you put into it in carrying it up, comes out again. When a bullet is fired half a mile up into the air, when the bullet gets back it strikes the earth with approximately the same energy with which it was sent up. The energy

which was stored in the bullet when it was sent up, comes out again, is manifested again when it strikes the earth. So the sunlight falls upon the green leaves, and is stored up in the wood that is formed ~~and the organic growth that~~ and the organic growth that is produced. Now, it may be shining upon a green field of wheat, and the energy is stored up in the grain of wheat, and the ox eats that wheat, and the energy which came from the sunlight is restored in the ox. Now, it may be it is a great tree that is produced, and this tree falls down, and under the influence of pressure is buried very deep under the surface of the earth, and after while it becomes converted into coal, and this coal is put into a furnace and burned, and steam is produced, and the steam runs an engine, and the engine runs a dynamo, and the dynamo produces electricity; and here we see the veritable sunlight shining out again--the very sunlight that shone upon the face of the earth thousands of years ago is shining out again now, resurrected sunlight; so the heat that we get from our stoves is simply heat that came from the sun, and it was produced in the form of wood or buried up in the form of coal and reproduced in our furnaces and stoves, in the form of gas, coal, and wood undergoing combustion. Now, the very same thing is true of our bodies, and the body stores up energy from the sun. Even windmills are run by the sun. The sun heats the air in one place and it rises, and that makes cold air flow in from another place, and a man puts up a wheel in the way of the wind, and the wind drives the wheel, and so runs the windmills. So the sun evaporates the water from the sea; it rises in the air, passes over a mountain chain somewhere, is precipitated down on the mountaintop, and comes rushing down the mountain side, and an ingenious man makes a wheel and puts it into the current, and the water turns the wheel, so the sunlight turns all the water wheels, you see. The water wheels and windmills are all turned by the sun, and the steam wheels or mills are all turned by the sun, because food is simply fuel. Now, you see, all food comes from the sun, and a man or an animal of any sort is simply a machine for using energy,--

~~maxfax~~ energy which has been stored up, sun energy which has been stored up. Have I made that clear? An animal, like a locomotive, is simply a machine for utilizing energy, for using energy, not for making energy, but for using energy which has been stored up from the sun, which has come from the sun and is stored up in the form of fuel or food which is also fuel. Now, what would you think of this proposition? Here is a locomotive that needs some fuel. Well, let us get some stoves and put into it. Suppose the fire in the stove is getting low, and you need some fuel; well, let us put some kerosene lamps into the stove. Now, it is true there may be a little fuel in the stove that has not been consumed yet, so in the lamp there will be a little oil, and if you put the lamp into the stove, there may be a little heat formed because there is fuel in the lamp. Now, it is exactly so if one animal eats another; it is simply one machine eating another machine; it is like feeding a locomotive a stove, or feeding a stove a lamp. It is using a mechanism that was created to use energy, as food for another mechanism which was created for the same purpose. It would seem like a horrible thing, wouldn't it, if you saw a locomotive going down the railway here, and every little while reaching out and seizing some small engine that ~~is~~ is passing by, or some small locomotive, a traveling engine, seized upon by a big locomotive and consumed. You would say that was an awful thing. That is exactly what one animal does when it eats another--exactly the very same thing. Animals are eaters, not eatables. Please get that into your minds, my friends--that an animal is an eater, not an eatable. There is a great difference between an eatable and an eater. An eatable is passive, while an eater is active. An eater is an active thing, while the eatable is a passive thing. A potato is an eatable, but an animal is an eater, and not an eatable. An animal is an eater of eatables. When one animal ~~maxfax~~ consumes another animal, it is the eater consuming another eater. You never find such a thing as an eatable consuming another eatable; you never saw an apple eating a potato; you never saw a loaf

of bread swallowing a pear or a plum or a cherry. That would be preposterous. But when you see one animal consuming another animal it is absolutely an unjustifiable operation; it is an eater consuming another eater instead of consuming an eatable. We think of animals as things. Animals are not things; animals are beings. The potato is a thing, and the apple is a thing. A peach, plum or cherry is a thing, but a horse or a dog or a cat or a sheep is a being, it is a sentient being. Why, you know, we do not stop to think that that beefsteak that is lying upon the table here, cut up and roasted, cooked ready to be eaten, that beefsteak a little while ago was looking out upon the world with eyes like ours. It was animated by nerves; it was alive, with red blood rushing through its veins, and the nerves in it were sentient and feeling, and thrills of energy were passing through it just as through our own muscles and our own nerves; it was a live, sentient, quivering thing. That was brought home to me very forcibly some years ago when I was down at Key West, and I was going down the hill toward the wharf in the morning, to take my boat for Cuba, and I passed a man coming up the hill that had a big wooden tray on his hand which he held over his head, and there was something on that wooden tray trying to get off. Every little while he would put up his hand and push it back, and I was very curious; I could not make it out. It didn't look like anything alive. It looked for all the world like a beefsteak on the tray, and he was pushing it back all the time, and I could not understand the thing at all. I went on, passed through a large archway, expecting to pass on to the pier which I noticed was just beyond, and as I stepped through the doorway, there was a spectacle just at my left as I turned to look about,--I was really amazed; it was the most appalling thing I had ever encountered in my life. I had seen a ghost, or thought I saw a ghost at one time, and I thought it pretty nearly got me and my hair was standing on end; but here was something that really looked more uncanny than any ghost I ever encountered. Here was a counter covered over with beefsteaks, chops of various

sorts, and they were all writhing and twisting about. I said to myself, "Here is a frightful thing", and I thought it must be the thing the ancient poet referred to when he said, "The very hides began to creep", for here was living flesh creeping about, and every little while the man who stood behind the counter was pushing it back from the counter, and there was a great heart there, almost as big as the heart of an ox, beating away regularly, as though it was in the body of an animal. Then here were these chops and steaks climbing all about the counter, and the man had to ~~pat~~ herd them to keep them on just as he would herd his sheep to keep them in the pen. Well, I stopped and gazed at it with a good deal of wonder. The man behind the counter noticed my surprise and astonishment, and he said, "Why, don't you understand?" I said, "No, indeed; what sort of place is this?" It seemed to me I must be somewhere near the very inferno, and I said "What sort of place is this; what does this mean?" "Why," he said, "don't you know? You are in the turtle market. Just look out that door." I looked out the door, and there were half a dozen great Tortugas turtles turned over on their backs with their legs just going in all sorts of fashion. By the way, when I was down in Boston the other day, a man was fined and sentenced for cruelty to animals for keeping a [~]tuttle on his back in the front window of his store. So the thing was made clear to me. That turtle flesh would not die till it was actually put into the pot and cooked. It remained alive for days. I bought that heart and took it away with me to Cuba, and it was beating the next day. Turtle's hearts have been kept alive beating for a whole week. That beefsteak you are looking at on the table, thinking about cutting up and swallowing pretty soon, is just that same sort of thing. It is not the sort of flesh that has the same tenacity of life that the turtle has, but it is really the same sort of flesh. If we look at the flesh of an ox through the microscope, it looks for all the world like the flesh of your own body. I understand that cannibals are very fond of human steaks. Down in the Sandwich

Islands when they used to eat missionaries, they used to call human flesh long pig you know. They said it tasted very much like pork, so they called it long pig. In one case, however, the missionary was not eaten; but he was not a missionary; he was a sailor. A boatload of sailors were ~~lost~~ lost on a certain shore, and a missionary afterwards inquired what became of them. There were twenty of them, and the native indicated that they ate nineteen of them. He made signs that they went down inside, nineteen of them, but one of them they did not eat. And why not? And after some considerable interrogation, they made out of the native this explanation. He said, "He taste too like tobacco." He was so saturated with tobacco they didn't like the flavor of him. Did you ever stop to think of that? If you are going to be eaten by a cannibal, would you like to have a bad flavor? You would like to have a good flavor, wouldn't you? I would. I have often thought of it, if a cannibal were going to eat me, I should like to have him really roll me under his tongue as a sweet morsel, and really like to have him have a good time eating me. I would not like to have him think of me, "My what a horrible flavor that is; my, isn't that nauseous?" I should like to have him have a good opinion of me. Now, when a hog eats meat that is just what happens to the hog. His flesh becomes unendurable. If you ever had the experience, encountered a piece of pork that had been fed on dead things, you know exactly what that would mean? A butcher told me he would not have such a thing in his shop, and he said he could always tell it by the smell of it, by the odor of the ox that had been fed on flesh. And now there are laws in many states that prohibit the selling of pork that has been fed on flesh. In Indiana and various other states there are laws that prohibit the sale of flesh of hogs that have been fed on flesh. If flesh makes a man such a fine man, why is it that it makes a hog such a poor hog? Here are two hogs and a man. One of the hogs is killed. Now, the other hog eats half of that hog, and a man eats the other half. Now, this hog that has been eating half of a hog is not fit to eat. What about the man? Is he any more fit to eat than the

hog? Now, if he is not fit to eat, is he fit to ~~kikk~~ live? That is the question. If a man is so unfit, if his body is so contaminated that his flesh becomes strong and badly flavored and tainted, as the old poet said, with food profane-- we taint our bodies with food profane when we eat the flesh of animals, said Ovid, in describing the views of Pythagoras. Now, if that is true, is the eating of flesh doing man any good? Certainly, it can not be so. Why is it flesh is so polluting to the body? It is because a part of that flesh --it is not simply flesh itself, but ~~xxxxxxx~~ what becomes of the flesh after it is eaten. It is because a part of the flesh and a considerable part of it too, ~~xxxx~~ ~~xxxx~~ after being taken into the body, and some of it is digested, undergoes decay, undergoes putrefaction; that is why the bowel discharges ~~xxxxxx~~ of the dog, the cat, the lion have such a horribly offensive odor, while those of the sheep do not. The contents of the bowels of any herbivorous animal are not in a state of putrefaction; they are simply waste matters; but the waste matters from the bowels of a carnivorous animal are simply horribly loathsome to the last degree. There is a parrot down in South America that eats bananas, and the bowel discharges of that parrot have the fragrance of the banana and have no more offensive character than a banana itself, because the diet is pure. There is no reason why the food that goes into the body clean and sweet and pure should be in a state of poison and in a disgusting condition when it leaves the body. There is no reason why clean food should be polluted by passing through the body. There is no reason why the stomach and the mouth and the intestines should become polluted any more than the hand does, not the slightest reason. It is only because we introduce putrefying materials. The flesh of a decomposing animal, of a decaying beast, of a corpse, if you please,--we introduce those things into our bodies, and portions which are not digested decay there, putrefy, rot in our interiors, and that is the reason why our flesh becomes polluted.

Now, my friends, that explains why some of you have these great brown circles around yur eyes, why you have got tawny skins and pimples on your faces, why you have got such a badly coated tongue and such a bad breath. I was talking to a man in my office the other day on this question, and it didn't seem to make any impression upon him. Finally I noticed he had simply a terrible breath. I happened to say to him, "Do you know, sir, what your breath smells like?" "No, I don't know." He said, "I didn't know it smelled bad; didn't know there was anything offensive about it." I said, "Well, sir, your breath smells just like a dead rat. And it did. I told him just the truth. Perhaps you go off on a vacation sometime and come back and find a bad odor around the house somehow, and you look about, and you find in a closet somewhere a mouse or a rat that died and is undergoing decomposition. Why? Because it is flesh. And there are certain putrefactive germs inside the body of that animal, and they are setting up putrefaction, gases are formed, and volatile poisons are formed, aromatic ptomains, toxines, and various other things,--cresol, indol, skatol and other poisons with horrible odors are being produced there until this aroma of dead ratax filled the house. Now, then suppose that dead rat had been lying around inside the body of another animal. Suppose instead of being a dead rat, it was a piece of a dead sheep lying around inside of you, decomposing and putrefying. Would it smell any less bad? The fact is we fairly fill our bodies with stench. The loathsome material that escapes from our bodies when we ~~live~~ live upon a diet composed of these decomposable, horrible excretions leave our bodies this way inside; and all those stench after being absorbed right into the blood, are poured out through the breath. That is the explanation of the bad breath many people have and try hard to get rid of and can't; that is the explanation of the dingy skin of the horrible complexions many people try to hide. It is the putrefaction produced in the body, polluting the body. Now, that is the reason whyx we do not recommend, why I don't recommend a meat

diet, or chicken as good food. Now, a person who likes chicken and eats chicken needs a turkey buzzard intestine and liver. The turkey buzzard can get along very well with that sort of diet. You would not like to keep a turkey buzzard in a cage in the house. A turkey buzzard is a very unsavory sort of bird, just as the fishhawk is, and all these carnivorous birds. They are very unsavory birds, for they have an offensive odor. But the turkey buzzard can get along and is pretty healthy after all. Why? Simply because he has the turkey buzzard's stomach, and liver, and you haven't. Now, turkey buzzards have livers five or six times as big as you have in proportion to the size. Did you ever notice what an enormous liver the chicken has, what an enormous liver the barnyard fowl has? What an enormous liver the pig has--a liver four times as big as a man's in proportion to his size; that is why he is able to live on such a diet. But even the dog gets old, rheumatic when he is twelve or fourteen years of age, or even before that time. There can be no question that the shortening of human life which has been going on during the centuries, particularly during recent centuries, so very rapidly, is very largely due to the increasing use of flesh as an article of food. There is no doubt about that. Certainly chicken is not to be recommended. And chicken is an animal, it is an eater and not an eatable.) I had a good illustration the other day of a different way of looking at it. I met a little boy at the table upstairs, and he was all alone, happened to be the last one at the table, and he sat up there alone, and I thought he was not quite satisfied with his dinner, and I said to him, "Well, sonny, did you get everything you want?" "Well," he said, "I would like a little chicken." "Why," I said, "Why, you would not like to eat a dead hen, would you?" "Oh, no, I would not eat a dead hen." He hadn't the slightest idea there was any connection between a dead hen and a roast chicken or fried chicken; he didn't suppose they belonged to the same category at all. (I heard the story of a little boy the son of a friend of mine. He was about seven

years old. He happened to be visiting a neighbor's little boy, and they invited him to stop to dinner, so he was sitting at the table with the rest, and the chief dish was brought in and placed upon the center of the table, and the hostess offered a portion of roast turkey to the little boy and he expressed great surprise. She noticed he didn't seem to know what to do with it, and she said to him, "Why, Willie, don't you like it, wouldn't you like some?" "Why," he said, "that looks very much like a dead turkey." She said, "Yes, this is roast turkey, and wouldn't you like some?" "Oh, no, I don't eat dead turkeys." Well, then, the lady thought in order to accommodate him she must give him a little of the stuffing of the turkey. So she began raking out some of the stuffing, and put some upon the plate and offered to him, and he was still more surprised. She waited a moment to see what he would do, and asked him if he didn't like stuffing. Said he, "What, would you eat what the turkey ate?" Now, we do not stop to think of the horribly abominable things we eat. Now, just think; there is a turkey that had had his viscera taken out, and had been stuffed full of good, wholesome food and then we deliberately put it upon the table and rake out the stuffing out of its body, from the interior of the body as a delicacy. In other words, we stuff a corpse with good, wholesome bread, roast it, bake it, put it on the table and rake out the interior of that corpse and offer it about, and eat it. Why, we have gotten down to some very loathsome things. We have some ~~habits~~ habits of the habits of savages and cannibals that are horrible, and some of the things we do are equally as loathsome as we think some of their habits are, and horrible and detestable. It is only because our forefathers were cannibals and roamed the wilds of Great Britain clad in the skins of animals and war paint, feasting upon their enemies; and it is because our savage still leaps and yells in our hearts; that is the reason why we can eat beefsteaks and mutton chops continually, because that old savage is still there. We must subdue it. We will when we get thoroughly civilized, if we ever do.

Q. What are the causes that produce diabetes?

A. I think autointoxication is the principal cause of it. I think meat eating is the principal cause of it, and I am not alone in that. There are a good many, I find a good many observing physicians who are ~~making~~ coming to recognize the use of flesh food as probably one of the causes of diabetes. We used to think it was because people ate too much sugar, but we have changed our minds about that. Possibly the extensive use of cane sugar might have something to do with producing this disease, but it is more than probable that it is produced by excessive meat eating. Now, why? What is the connection between meat eating and diabetes? This thing has been known for some little time, that when there is disturbance of the glands ^{of} ~~the~~ internal secretion, the thyroid gland and other internal glands,--that when these glands are disturbed, sugar frequently appears in the urine; in other words, we may have incipient diabetes as the result of disturbance of the thyroid gland. Now, the thyroid gland, it is generally believed as the result of observations that have been made, especially by several eminent French investigators, and some German investigators, and some researches made in this country--the thyroid gland is probably controlled by a little gland up at the base of the brain, the ^{to}hypophysis; and this little gland probably controls the thyroid gland. It is a very small gland, but it has a controlling part, and a nervous part too,--part nerves and part gland, and an observation ^{Dr. Curtis} has been recently made that seems to confirm this idea. A physician connected with Johns Hopkins university has been making experiments upon animals, removing this little body at the base of the brain, and he has found when this little body is removed, that there is an enormous increase in the power to assimilate starch. The power to utilize starch is enormously increased. Now, this seems to show that when this gland is overexcited, that the power to utilize starch is lost, or diminished. At any rate, when the gland is removed, the animal gets the power to utilize an enormous amount of starch, much more than before.) These observations

are not yet published. I learned about it when I was east the other day from a friend of mine in Boston who happened to know the facts, and he was already making some experiments right along the same line. Dr. Curtiss of Johns Hopkins University has made these observations, and they will be published in the ~~bulletin~~ bulletin of the Johns Hopkins University. This quite agrees with this observation. Excessive activity of the hypophysis is the cause of diminished metabolism of starch, and this causes the diabetes. A person suffering from diabetes has lost his power to store up glycogen. A man suffering from diabetes needs to train himself to eat more starch, and more starch, and more starch if he can, all he can assimilate, because he can not get along without starch. Starch is the source of glycogen, and it is the source of life and energy in the body, and when the glycogen is used up, that is the end of the man.)

Q. What are the complete symptoms of neuritis?

A. The principal symptoms of neuritis is pain in a nerve. In time, it may be atrophy of the muscles to which the nerves are distributed. There are tingling sensations, burning sensations, disturbing sensations that come along all combined.

Q. What is the treatment given in this institution for this condition?

A. The treatment is first of all to remove the cause of the neuritis. This cause may be mechanical, or it may be due to an injury, or it may be a cold, but it is most likely to be toxins; it may be alcoholic toxins, tobacco toxins, or tea or coffee toxins, or toxins formed in the colon and absorbed into the blood and that is the most common cause of all,--is the poison formed by putrefaction of flesh in the colon. These poisons are some of them extremely virulent in character.

Q. Is it possible by any chemical means to destroy the poisonous qualities of meat?

A. Yes, indeed. Combustion will destroy the poisonous qualities of meat entirely, cremation. That is just the way in which it can be done, and done effectively. I do not know of any way in which it can be done without destroying the nutritive properties of meat very largely. At any rate, nobody would want it. Some years ago, when I began to learn about the real properties of meat, we used to use meat here, a large amount of it; we used to use several oxen a week here. For a score of years in this institution we used from one to four oxen a week; so we know something about the use of meat, and we stopped it only because we were forced to discontinue the use of meat. We could not cure our patients while using meat, and we became so thoroughly convinced of it that we dropped it out more and more and more until we finally got rid of it. In the later time of our use of meat, we had what we called laundered steaks. We wanted to get rid of the uric acid--the urine that was in the tissues, we wanted to get rid of them, so we had to wash our beefsteaks, and put them through a regular laundering process, washed them and scrubbed them, and ran them through wringers, and when they came up on the table they were almost as white as a sheet; and they were not popular somehow, we could not induce people to relish them. A laundered steak has no more flavor than a piece of india rubber. It tastes very much like a piece of india rubber, so you can readily see why they were not popular. It is the waste matters, the uric acid and other poisons, poisonous matters there that give the steak its flavor. When you wash away all the poisonous matters, what is left, the nutritive part that is really useful, so far as it is useful, the food part that is left behind has no flavor at all; nobody can stomach it. I am satisfied that that experiment was not a success, so we gave it up, and finally threw the whole thing overboard.

Q. Can the ravages of arteriosclerosis be checked, and if so how?

A. Yes, the ravages of arteriosclerosis can be checked if we begin

early enough. Now, it is exactly as it is with a fire. Arteriosclerosis is a house afire. A man that has got arteriosclerosis is exactly like a house afire. His house is on fire; it is burning, and it is not simply a fire in the house; it is a fire of the house. Now, you know you may upset an alcohol lamp, and it burns a hole in the carpet, but when the alcohol is burned out, the fire would go out. There would be a hole in the carpet, a burned spot on the floor and perhaps on the ceiling, and things might be somewhat smoked up, and that would be all. The house would still be as substantial as before. That is acute disease--measles, scarlet fever, typhoid fever, or something of that sort. But suppose your furnace pipes get hot, and the fire starts in the partition and works up through the partition, spreads in the partitions, and by and by bursts out through the roof of the house, and your neighbors come bursting in the door, and shouting, "Your house is afire." That is another situation, don't you see? It is not a fire in the house, but it is a fire of the house. Now, that is arteriosclerosis. That is a disease in which the whole house, the whole body is falling into disintegration, into decay, becoming senile. Bright's disease is a fire in the kidneys; it is a diseased condition of the structure of the kidneys. The kidneys have got old before their time. Arteriosclerosis is simply old age. As a French physiologist tells us, a man is as old as his arteries. He is as old as his arteries. If your arteries are old, you are old, no matter when you were born; you are old if your arteries are hard, if they are shriveling, then you are old. If the process is going on in the kidneys, then the kidneys are old; if it is going on in the liver, then the liver is old; and if it is going on in the brain, then the brain is old, and you will probably have senile dementia, and you may have it when you are 25 or 30 as well as when you are seventy-five, practically the same disease. So we must begin early if we are going to put out the fire in the house, and we may be able to put it out even when it is bursting through the roof, but what kind of a house have we got?

It is gutted; it is a wrecked house, and perhaps will have to be torn down so it won't fall down unexpectedly. The house is spoiled; it is wrecked. Now, it is so with arteriosclerosis if we let it go on too long. We may stop the further advance of it, but perhaps the house is spoiled, or only waiting to topple over when a little wind comes along, just a little extra strain of some sort and it will fall in. That is what happens when a man gets apoplexy. That is what happens when a man dies of heart failure--because the heart has been overworked, a long time in trying to circulate the blood against too high pressure, you see. And it wears the heart out. But suppose we have got the case in time, a man with a blood pressure of 150, we will say; his arteries are a little hard, but not chalky yet. What can we do for that man? A concrete case will illustrate it I think as well as anything. A doctor, a man very eminent in his profession, a man who held perhaps the highest position that a medical man can hold in the United States, in fact the head of the United States army medical service, the former Surgeon-General of the army, called into my office last summer,--a tall, stately, big, splendid looking man, and I was very much surprised. I said, "Why, Doctor, I am surprised to have a visit from you." "Well, Doctor," He said, "I want to say to you that I have come here to have a thorough examination, and for you to tell me how to live. Now, I supposed I was all right till a couple of days ago." ~~ixman~~ He was in the same state of mind as Paul Morton was you remember, the president of a great life insurance company; he thought he was all right, looked the picture of health, and went up to be examined for life insurance, and found they would not insure him; his own company could not insure him. They got out a new kind of policy, and he was going to be the first one insured under that policy, but his own company could not insure him, but advised him to go and see a doctor right away. In three months he was dead. Now the Doctor said, "I was examined two days ago, and found my blood pressure was 210.

"Now, you can imagine how I felt when I heard that, because I have just retired a few months ago, and I have been counting on having ten or fifteen years of pleasant life, a good time, could do what I like, travel and have a good time, and with a blood pressure of 210, that means, I see, that I have got a funeral in my program instead of a pleasant life, and I do not feel well about it at all. Now, I want you to examine me and tell me how I can live so I can live a few years and have a good, pleasant time, as I have been calculating on."

"Well," I says, "Doctor, let us look it over and see; perhaps you haven't got such high blood pressure after all." I took his blood pressure and found it 210, sure enough. "Well, Doctor, let us see; I suppose you smoke?" "Oh, yes, I smoke; all army men smoke." "Well, do you know what a cigar does to a man?" "Why, a cigar doesn't raise blood pressure, does it?" "Why, certainly it does. One cigar will raise blood pressure twenty points in thirty minutes. Dr. Janeway, of New York, says that, and I know it, because I have demonstrated it repeatedly. A single cigar will raise the blood pressure thirty points in half an hour. Your blood pressure is 210 already; how much higher do you want it to be? Suppose you smoke a cigar and raise it twenty points more, then it is 230."

"Well, I guess I will have to cut them out." "Well, Doctor, how about coffee?" "It doesn't do any harm to drink coffee, does it? That doesn't have anything to do with blood pressure, does it?" "Doctor, how about uric acid? Does that ever raise blood pressure?" "Oh, yes, oh, yes, uric acid raises blood pressure."

"Well, now coffee has caffeine in it; caffeine and uric acid are the same thing. They both raise blood pressure. Suppose you had a man here lying in a state of collapse, his heart had almost stopped beating, and ~~he~~^{you} wanted to raise his blood pressure; he is in a state of shock, collapse, and you want to raise his blood pressure; what would you give him; what would you inject under his skin?"

"Why, I would give him a dose of caffeine." "Certainly, you would. Caffeine is

the only drug we can depend upon to raise blood pressure; we feel sure, more certain than caffeine will raise blood pressure than any other drug. If there is ~~ix~~ any power that will raise it at all, that is the one drug that will do it. Caffeine is the most reliable of all drugs for that purpose. Now, how large a dose would you give a man?" "Oh, I would give him three or four grains, and then repeat it if necessary." "Doctor, did you know that Dr. Wiley examined coffee and found that a cup of coffee has four grains of caffeine in it, four grains of caffeine? There is a full dose of caffeine in every cup of good coffee, and your blood pressure is up too high, and how much coffee do you think you ought to take?" "I guess I will have to cut it out. It is rather hard, but I guess I will have to cut it out." "Now, how about beefsteak?" "Of course, we army men use a good deal of meat." "Doctor, do you know Dr. Hall, of Manchester?" "Yes, I have heard of him; he is the physiologic chemist over there." "Well, Dr. Hall a few years ago devoted a year and a half to the study of uric acid, and he found in a single pound of beefsteak fourteen grains of uric acid. Now, it is two days' work for the kidneys to eliminate that fourteen grains of uric acid. Six grains a day is the day's work for the kidneys. That is the regular work of the kidneys for a day in the elimination of uric acid; so there is two days' ~~work~~ work for the kidneys in one pound of beefsteak, and seventy grains in a pound of sweetbreads." "Well", the Doctor said, "I guess I will have to take it out, but I don't see how in the world I will ever get along without it." I said, "Well, let's try it." In just four days the Doctor was down in my office, and he sat down in a chair his face just beaming with smiles. "Why, Doctor, it is breathlessly interesting, it is breathlessly interesting; my blood pressure has come down thirty points in four days", and so it had. I took it myself, and it was 180 instead of 210. Now, the first thing is the diet. I just mention this as a concrete fact so you will see ~~happ~~ what happens. I have seen that thing happen in scores of cases, hundreds of cases. The average man

who comes here with a blood pressure of 140, 160, 180, or 200 loses twenty or thirty points or more from the change in diet in the first two weeks he is here. But there is more than that. The body must be rebuilddd. Dr. Haig says it takes three months to change the tissue of the body, and I think that is true. The tissues have to be changed, sometimes agin and again and again. It is one of the most important questions that could be asked here, is this very question of what could be done in arteriosclerosis, because that is the one disease that will go marching steadily on just like a fire in the house unless there is something radical done in the way of change of habits,

Q. Is saccharin good for diabetic patients?

A. I don't recommend it. It is not very toxic, but is somewhat poisonous.

Q. What is the proper regimen for a patient with arteriosclerosis?

A. I think I have pretty well answered that question already. I might say in addition, eat a great deal of green, fresh vegetables, uncooked vegetables, lettuce, and cabbage, and fresh raw fruits. Drink a good deal of water, wash out the waste matters and make the blood as clean as possible; get the tongue clean, and keep the bowels moving three or four times a day; keep the skin active, and keep in the open air and the sunlight, and take a good deal of exercise. Walk several miles a day, get into a good perspiration every day. Be careful about cooling off.

Q. What objection if any is there to the use of vinegar?

A. Vinegar is worse than alcohol. Prof. Voix, of Paris, showed some years ago that vinegar ~~has~~ or acetic acid has twice the power of alcohol to produce gin liver.

Q. What do you think of horse radish as an article of food?

A. It is not food at all. It is poisonous, ^{value} ~~has~~ no food at all.

Q. Does very hard work cause arteriosclerosis?

A. I very seriously doubt it. It is claimed that arteriosclerosis is common among longshoremen who ~~mak~~ do very hard work, but these longshoremen eat enormous quantities of meat, and I think it is the beef, the meat, rather than the hard work, that produces arteriosclerosis; because over in England there died a good many years ago an old man who lies buried in Westminster Abbey, and you may see a slab which marks the place where he is buried, in one of the aisles of Westminster Abbey. His age at death is authenticated by the very best authorities as 152 years and nine months, and he was examined after death by Dr. Thomas Harvey, who made an examination of this man's body after death, and he could not find a hard artery in it. Almost 153 years of age, and not a hard artery in his body. No arterial change at all. He died of indigestion. The King brought him up to his court because of his great age, and he feasted him three weeks, then he had a fit of indigestion after eating a big dinner, and died of gastritis, died of indigestion, probably acute intestinal auto-intoxication. He lived all his life on black bread, potatoes and buttermilk. That was that man's diet, and he worked hard; he was a laboring man, and had to work all his life for a livelihood, and he worked hard. So it is not hard work that produces arteriosclerosis; it is bad eating.

Q. What would be the cause of a sickening dull pain extending over the left spine, to the left hip, and down the side of the abdomen?

A. It is more likely to be a diseased condition of the colon than anything else. If we investigate that case, we probably shall find there is colitis, and on examination of the colon, we will probably find it is contracted and feels like a rubber bag. That is the probable cause. The pain is simply reflex. There might possibly be something else, might be sarcoma or cancer, tubercular disease or something else, but in more than nine cases out of ten we will find the cause to be what I have stated.

Q. Will water that contains lime cause gravel in the kidneys?

A. I think not.

Q. Will gravel cause gallstones?

A. No.

Q. In what form is yogurt best taken, liquid or in the form of tablets?

A. Some people cannot tolerate milk. Dr. Combe of Lausanne calls attention to the fact that some people suffer from milk dyspepsia or casein dyspepsia or inability to digest milk for some reason. I think it is because casein is not readily absorbed, and it remains in the colon and undergoes decomposition there and so encourages auto-intoxication. I think this is the reason why milk disagrees with some people, and such persons should take the yogurt ferment in the form of tablets.

Q. Is it injurious for persons suffering from diabetes to take sweets such as syrup and sugar; also salts and fats, and dried beans?

A. Yes, it is injurious for such a patient to eat most of those things. The fats can be assimilated in reasonable amount. Beans can be used to some extent, but sugar and syrups should be avoided entirely.

Q. Why not use fine salt in the treatment rooms?

A. The purpose of the salt rub is to excite the skin. Some complain that the salt is not coarse enough, but if any of you find it is too coarse, call for a finer brand. We have both kinds.

Q. Why not have rhubarb sauce?

A. It is unfit to eat. It is poison. The acid of rhubarb is oxalic acid, and it is poison. You use it to take out ink spots and things of that sort. It is not fit to go into the stomach. Oxalic acid is different from organic acids. It differs from other organic acids. There are three organic acids which are foods and assimilable,--tartaric acid, malic acid, and citric acid. Oxalic acid is poison; it is not assimilated, but passes through the body

and acts as a poison in the body.

Q. Is it wise to go into the swimming pool just after taking exercise in the gymnasium?

A. Yes, it is a good plan provided you are not exhausted. One should never go into a cold or cool bath when perspiring and exhausted. The perspiration does no harm; it is a good preparation for a cold bath provided you are not tired. A cold bath requires reaction, and reaction requires action of the spinal centers. If one has been exercising or working until he is exhausted, then these nerve centers are not able to produce the reaction, so when the cold strikes the skin and the blood rushes in, it does not get back again, the proper reaction is not produced, and harm may be done. Fatigue is the contraindication in perspiration, and exhaustion is the contraindication for a warm bath when perspiring.

Q. What is the cause of the nose feeling cold to the touch?

A. It is a vasomotor disturbance, a contraction of the blood vessels of the nose. In a dog it is said to be a sign of health. In a dog this coldness of the nose is due to the fact that the dog does not perspire on his skin in general, but all the perspiration is about his nose and mouth. That is the way the dog cools himself off--is by the evaporation about the nose and mouth, so that is perfectly normal for the dog; but the human species perspires over the whole skin, and evaporation is taking place from the whole surface and not specially the nose.

Q. What is the cause of neurasthenia?

A.. Neurasthenia is not a disease; it is a symptom. It is an artificial disease, we might say, created by Dr. George M. Beard, of New York City, 25 years ago. I helped him make it. I was a private student with Dr. George M. Beard, a post-graduate student. He was an expert in electricity, the most expert of anybody in the scientific application of medical electricity in the United States. I had gone to him after graduating in medicine to study, some 36

years ago, to study electricity and nervous diseases in which he was a specialist in New York. I found him busily at work collating symptoms, and I helped him in this work of collecting symptoms, and classifying the symptoms of various nervous patients that came in. After while he collected a large group of these symptoms in which it was not plain what the cause of symptoms was--the patient did not have any organic disease to which the symptoms could be traced, and he put these all together in a group and called them neurasthenia. It is purely a symptomatic disease. I don't hold myself responsible for the disease, but only as I said, I helped make it working simply as his assistant. I think it is generally recognized at the present time--personally I have always held that neurasthenia was not a disease at all, but only a symptom of morbid conditions which were the real disease. Neurasthenia is nothing but a symptom. It is no more a disease than dropsy, no more a disease than headache is a disease, only it is a larger group of symptoms, and it may be the outgrowth of various conditions. Neurasthenia is most often due to intestinal autointoxication. The man that has chronic neurasthenia generally has a coated tongue, a bad breath, inactive bowels, very often has colitis and other indications of intestinal autointoxication. Clear off his tongue, get the bowels into normal condition, get the skin cleared up, and all the other symptoms disappear.

Q. What causes the blood vessels to stand out very prominently on the left side of the head?

A. This is a condition which is very often present in persons who have suffered much from migraine headache. It most commonly occurs on the left side of the head for the reason that the left side of the body seems to be a little weaker than the right side, and seems to be more subject, especially to nervous diseases than the right side. And the blood vessels of the left side are very often found more prominent than the right, because of these frequent attacks of congestion.

Q. Is constant dizziness usual in cases of auto-intoxication?

A. It is a very common symptom indeed, due to poisons absorbed from the intestine attacking the brain.

Q. Is beer sanitary?

A. No.

Q. Should not a person who has been here two and a half months show some sign of improvement?

A. That depends upon what he is doing and what has been done to him. It may be he has improved and doesn't know it. A man who thinks he is no better just thinks he is no better because some one particular symptom is just as prominent as when he came. If we should inquire carefully into such a case, we should probably find many indications of improvement. For instance, I met a man some time ago who was sure he was no better. He had been here several weeks, and was no better. He said, "Now, here, Doctor, I have the same pains on the top of my head I had when I came here, and I am not a bit better." "How about your strength? What was your strength when you came?" "1500 pounds." "What is it now?" "2500 pounds." "Isn't that better?" "Yes, but the pain is just the same." "But you can ~~gain~~ lift a thousand pounds more than since you came, and that is better so far. Well, isn't your tongue cleaning off?" "Yes, I admit that." "What about your appetite?" "I have a better appetite than when I came." "How about your sleep?" "I sleep better, but I am not a bit better than when I came here; that pain is just as bad." Yet almost every other symptom had almost entirely disappeared. I said, "Now, it looks to me that when that pain disappears you will be well. One of these mornings you will wake up and find that pain gone, and will pack your trunk and be off home before night just as like as not." A man getting well is like a man that has been away down deep in the water, and is coming up; we have got a grappling iron around him and are pulling him up, we can see he is coming up; he can not see, and he feels just as bad as before; feels just as bad at ten feet under water as when he was 100 feet under

water. When he is a foot under water he feels just as bad as though it were a thousand; when he is half an inch under water, he feels just as bad as though he were at the bottom of the sea. It is only when he comes up and gets his nose out of the water that he begins to feel better, don't you see? Now, I said to this man, "Your nose is just half an inch below the surface. Tomorrow morning, just as like as not, you will be all right." And it turned out that way. These symptoms have been present for a long time, months and months and months, and got stuck pretty fast. It is hard to dislodge them sometimes. When they finally disappear, the work of cure is almost completed. But when one gets rid of all of his bad feelings, he is likely to be well. It does not come in a day. Getting well by the Sanitarium process means reconstruction, making the body all over new, getting rid of the old sick man, and putting on a new man of health, well, vigorous joyous man.

Q. Do you ever find auto-intoxication among vegetarians?

A. Yes, indeed. It is often present among vegetarians. You can hardly ever find a vegetarian who has not at some time been a meat eater, or made use of eggs and milk, and eggs and milk as well as meat will produce intestinal auto-intoxication. I don't think intestinal auto-intoxication will be likely to arise in a person who has eaten no kind of animal protein. Prof. Tissier of the Pasteur Institute holds that view and I believe he is right about it--that auto-intoxication is due to the decomposition of animal protein and is not likely to begin, or to originate at any rate, with the ordinary vegetable proteins, because the amount of protein we find in the vegetables is so small and always associated with carbohydrates which are sufficient to prevent the putrefactive process.

Q. What causes a person to feel extremely hot after a meal and intensely cold half an hour later?

A. It is only a very susceptible person who would notice that. But

when a person takes a meal, the heart is stimulated and there is an increased flow of blood and a person feels warmer, is warmer just after the beginning of the meal. But after the ~~process~~ process of digestion is well established, the large blood vessels of the abdomen here are well dilated, and a large amount of blood is accumulated in the abdomen here to carry on the digestive process, and people who have very sensitive vasomotor centers are likely to suffer in consequence of this spasm of the vasomotor nerves of the small vessels of the extremities. The overexcited state of the viscera here reflexly excites the vasomotor centers of the brain, and in that way causes spasm of the vessels of the arms, feet and legs, so a person feels cold. It is not because the circulation is weak, but because his blood vessels are in a spastic state. Such a person gets colder every minute when he exercises. The best way to relieve it is to lie down, because the vertical position encourages the accumulation of blood in the abdomen. Another good way is to raise the chest high and take very deep breaths. I saw some patients in the gymnasium this afternoon lying down on strips of carpets raising their legs and arms chest high. That is one of the very best things you could possibly do to relieve the condition just described, because it drives out the excess of blood from the abdomen, gets it into the extremities where it is needed. This can be better accomplished by exercise in a horizontal position or by simply lying down on a couch or taking exercise upon a bed. I think I have answered all the questions. I thank you for your patience.

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SOME FEATURES OF RACE DEGENERACY.

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., May 18, 1911,

At 8:00 P. M., By,

J. H. Kellogg, M.D.

Ladies and gentlemen: I suppose you are all improving your present opportunities to get outdoors, to get all the fresh air you can. There is no excuse for sitting indoors such weather as this; in fact, it is rather embarrassing to be indoors here, and we really need a little more fresh air here.

Now, we have upon the screen here two very shapely heads combined. The black line here represents the skull of a man whose skeleton was found buried away down beneath the gravel in a place which was some years ago, nobody knows just how long ago, the bed of the Thames river. It is now forty feet above the present bed of the Thames river, and it is claimed that the movement of the bed of the river up and down, since this skeleton of which this skull is a part, was deposited, amounts to 170 feet, and the calculation of geologists takes is that it is the ~~the~~ bed of the Thames river about a thousand years to change a foot; so the calculation is that this skull belonged to a man who lived 170,000 years ago. Here is the outline of the skull of the man. The shape of the head is the thing that is important. The shape of the head of the cave man was sloping from the front and more like the head of an ape, a very small brain; because the cave man who was supposed to have lived 150,000 years ago had very much the skull of the ape it has been argued that man must sometime have been an ape and has gradually worked his way up; so this was rather a serious problem for geologists to wrestle with, how it is that this galley hill man had a skull in every respect equal to that of the modern Englishman. He has well developed

teeth, you see; that is one beautiful thing about it. This skull has 32 sound teeth in it. The teeth have endured all these years. Teeth of the olden time were evidently made of better stuff than those of modern growth. The same thing is observed about the teeth of the Mound Builders--there is much less evidence of decay; and even so late as the plague of London, the skulls which have been exhumed have been found to be of much better material--the teeth, showing much less evidence of decay, being much sounder. A large number of skulls are found in the museum of the College of Physicians and Surgeons of London, the great medical and surgical museum of London--it has been found that these skulls which are dug out of what is called a plague pit--the bodies were buried in these pits when they didn't take time to give them a formal burial,--these skulls are found to have teeth much sounder than those of modern men; so the indication is very strong that we are degenerating. In fact there are many indications of that.

There can be no doubt, when we come to study the matter, that we are rapidly degenerating; we are losing our teeth. The outside incisor teeth are lacking in a good many persons. If we have them at all, they are perhaps mere little pegs, and we have to get the dentist to fix them up for us. So we are losing our toes, as I told you the other night, so I won't dwell particularly upon that tonight.

I want you to compare these skulls as shown by the heavy outline and the dotted outline of the skull of the modern Englishman, so you will see there is practically no difference. So the ancient man had just as good a head as the modern man; he had just as big a brain as the modern Englishman, and he didn't look any more like a monkey than the modern Englishman does. Of course, we are more or less closely related to apes; we can not escape kinship; but this ancient man was no more like an ape than is the modern man.

Here is another thing I want to call your attention to. The human race is dying at the top. It is decaying at the top. It is like a tree, and I had this little design made to make this apparent to you. When you see a tree beginning to die at the top, you do not have much hope of that tree. If a single branch somewhere near the ground dies, you lop it off and expect to save the tree; but when you see a tree dying at the top, you know something serious has smitten that tree, and that its days are not very much to be prolonged. Now see what we have. Here is Bulgaria, with a population of ~~7,300,000~~^{three} million, and 3000 centenarians, one centenarian for every thousand people. There are just a few twigs dying at the top in Bulgaria. In the United States, we have only 3600 centenarians in the whole United States, one in 25,000. Bulgaria has 25 times as many centenarians as we have in proportion to the population. When we come to Spain, it is one in 44,000; in France, one in 190,000; England, one in 200,000, and in Germany, one in 700,000. The centenarians are nearly all gone. The tree is rapidly dying; the top is nearly dead. But because we see a good many sprouts growing up around the root, we must not imagine the tree is flourishing. We find we are keeping alive a great many babies and young people that formerly died off. Half a century ago, nearly half the babies died before they were a year old, and now about one fourth of them die before they are ~~one~~ a year old, and two fifths of them die before they are five years old; but we have been keeping a whole lot of them alive that used to die. So the average length of life of the population is increased, but the number of persons who acquire great age is rapidly diminishing. In other words, the tree is dying at the top. Now, we will resume our talk of last week where we left off.

Here is this race degeneracy that is progressing so rapidly. The Old Book says the blood is the life. When the Creator gave to Nah permission to eat flesh, he took particular pains to tell him he must not eat blood. "But the blood thereof, which is the life thereof, thou shalt not eat of it." The

fact was recognized away off in prehistoric times that the blood is the life, and the blood was regarded as sacred; it was respected, and it was regarded as the source of life in the body. Now, so long as the blood is clean it can maintain the bodily life, activity and efficiency, because the blood is the element of the body which fights for the life of the body. There are something like 20,000 million million of these blood cells in the body at one time. A large number of them are germfighters; their function is to defend the body against germs, and against poisons. Now, so long as the blood is clean, so long as the blood is pure, so long as it has a high standard of vitality and vigor, it is able to make a good defense. Now, some of you were examined here perhaps yesterday, perhaps some day before; and all of you had your blood examined when you came, and some of you had a report that your blood was 100. That means that your blood is up to the standard; it has the normal amount of blood cells, for the normal activity, and the quality of the blood is normal as far as that examination can determine. Some of you had this examination and found your blood was 75. That means you are 25 per cent below par. It means your defensive army has only three quarters the number it ought to have. Some of you had a report of 50%. That means that half the soldiers in your army have been killed off, have died of cholera, perhaps, or beri-beri, or something else; they have died, and you have only that per cent of your fighting force. Now, just see what your situation is,--it is just like that of some of those cities down in Mexico that had to capitulate because their fighting force was too small to contend against the enemy; they had to surrender. That is just your situation and you have been surrendering; you have been surrendering, and that is why you have come here at last. You really have got to the point where you had to capitulate completely, and you have to surrender to our old enemy, death, pretty soon if we can not reinforce your fighting men. It is of greater importance than anything else that the fighting power of the body should be maintained at the full amount, the high-

est standard, the normal standard. That means 100. We had a gentleman some time ago whose blood was down to 26. By the way, I had a letter from that man today. When his eyes were closed, he looked as though he were dead. He was really in a very sad situation, with pernicious anemia. I had a letter from him today saying he was sorry he had to leave just the day before I returned from my short vacation a little while ago, and he wanted to write to tell me that he went away full of life. That is his expression; he said, "I went away from the Sanitarium full of life." He was here about ten weeks, I think, and he has got his blood back again, and he is the happiest man in the State of Illinois, and I am happy too, because he was a very useful man. I met him about sixteen years ago away down in old Mexico, and he was a pioneer missionary down there, and it did me a great deal of good to know that under a good Providence, we had been the means of bringing him back to health, life, and vigor again. It was all because his blood was restored, you see. He was quite right in saying he has gone away full of life. He has gotten his blood up to normal again and feels the energy and vigor he once had, and the defensive power he had before. Now, it is important, then for us to consider the organs of the body which maintain this situation of the blood, or keep the blood pure, that make the blood.

In the first place, the blood is made in the bones. That is a curious thing, isn't it--the blood is made in the bones, these ugly, uncouth bones. They are the laboratories in which this marvelous fluid, the blood, is made. All the blood is made in the bones. We can not do very much for the bones; but when the blood becomes unclean and impure, then this blood-making process is interfered with.

Now, the most conspicuous organ you see here is the liver, a great gland that weighs three and a half pounds--the biggest gland in the body, and one of the most wonderful organs in the body, the most abused organ in the body--how many people say, "Oh, my liver, my miserable liver", and go to a doctor and

ask the doctor to give you something to stir up your liver. You want the doctor to give you a drug you can put in there and stir **your** liver up. A man went to his doctor and asked him to stir up his liver, and he gave him some iodid of mercury which didn't do a thing to the liver but hinder it a lot; didn't do it any good at all. Calomel is a very common drug that people use to stir up livers. It doesn't do the liver a bit of good, but simply hinders it. An old doctor of Edinburg proved more than 100 years ago, by experiments on dogs, that calomel actually lessens the work of the liver. Under the influence of calomel the liver makes less bile than it does when the calomel is not given. And Dr. Rutherford, a modern English investigator, made a careful study of the same subject in a man with a biliary fistula, and proved in this case by careful experiments, that mercury in all forms lessened the work of the liver; so there is no excuse for it, and I don't think any of you will ever take another dose of calomel for the benefit of your liver. It may be for the benefit of the undertaker, but it won't do your liver any good, you may be sure of that. What is the reason the liver seems to get lazy? It is not because it is lazy; it is not because it has forgotten to do its duty; it is not because it is negligent; it is not because it is inefficient; it is because the liver has more work to do than it can possibly do. It is an overworked liver, like a poor donkey that is loaded down until it can no longer stagger under its load, and it falls down upon its knees. That is the situation of the liver; it is simply overwork; it can not do its duty. Now, let us see what its duty is. One of its duties is to collect all these blood that is brought up **from** the internal organs, the stomach, colon, and the intestines and various other internal organs,-gather all this blood up and filter it before allowing it to pass on into the general circulation, up to the heart, and to be distributed all over the body. That is one of the most important functions of the liver--to inspect the blood, to examine the blood, to filter and to purify the blood. It does many other things, but that is one of the most im-

portant things we want to talk about tonight, is this purifying, blood-purifying function of the liver. Now, when the liver becomes crippled, it can no longer do that. That is the reason why, when Pawlow made an experiment upon a dog-- here you see the larvevein that brings the blood into the liver and distributes it, and these various lobes of the liver are divisions in which the work is done, or which purifies the blood; then the blood is sent up to the heart to be distributed to the body in general. This shows the little cells where the work is done. The blood is all brought in here to be filtered, and it is inspected by these little cells arranged in a row all along the line of these small blood vessels; then after it has been inspected, it is sent on through the great central vein to be distributed to the body after it has been purified. The liver not only takes out poisons, but it destroys poisons which it gathers out, and it takes out germs also; and this illustrates an experiment I was telling you of a moment ago--how when the liver is crippled, it can not do its proper work. This is what is known as Eck's fistula. Here is the vein that carries the blood to the liver to be purified, and here is the large vein that carries the blood up to the heart for distribution to the body. This vein is not usually joined as you see it here, but it is separate. The blood is carried through the ascending vena cava to the heart, and is then sent out through the body. This experiment consists in joining this portal vein to the ascending vena cava so the blood, instead of going to the liver to be filtered will go straight into the general circulation, go straight through the body without any filtration. I saw this experiment made in Pawlow's laboratory at St. Petersburg, four years ago. The dog that has this operation performed gets along all right for a few days. In this particular case the dog did not happen to get along all right, but usually it does. The dog died of shock after the operation the next day, but generally the dog survives, and the dog gets along perfectly comfortably so long as it has just the right diet. But the diet it must have under these circumstances is

a diet of bread and milk, cereals, oatmeal mush, and things of that sort. It can not eat meat. The moment a dog begins to eat meat it gets sick, and if it eats meat for three days, it is a dead dog every time. The dog can not survive more than three days on a meat diet when its liver has been crippled in this way; because when meat is taken into the body, poisons are taken in with the meat. Not only that, but portions of the meat that are not digested undergo putrefaction in the colon. I want that idea to get thoroughly impressed upon your mind. It is not simply the poisons that are in the meat and which amount to a good deal, but it is the putrefaction of undigested fragments of the meat that remain in the intestine. Now, you know the difference between the bowel discharges of a cat or a ~~gndxx~~ dog and those of a sheep. The bowel discharges of a sheep are not so very offensive, but those of the cat or dog are horribly offensive. You know very well the difference between a dried up and rotting apple, for example, and a decaying rat. If you are off on a vacation and when you get home you find a bad smell in the house, somebody says "dead rat", and you begin to look around, and by and by find a little mouse dead in a closet, and the whole house has been saturated with the stench of that dead mouse. Suppose there were half a bushel of decayed apples down cellar; the house would not be scented up in that way. The apples might smell a little stale, but there would not be the horrible, penetrating odor that pollutes the entire house so that it is impossible to stay there.

Now, that is the thing I want to impress upon your minds, my friends, that dead flesh is the thing that makes that dead rat smell so bad. The odor of that dead rat is simply the odor of putrefying flesh. And bits of putrid beefsteak smell just as bad as a dead rat. A piece of dead cow or dead sheep or dead hog smells just exactly as bad as a dead rat--worse, because there is more of it. So when you have gotten into the intestine fragments of flesh of any sort, fish, flesh, or fowl, that are undergoing putrefaction there, the effect

upon the body is exactly the same as though you swallowed a dead rat for breakfast, or ate a putrefying mouse you found in the closet and swallowed it. Now, suppose you have swallowed some flesh and it has gone into a state of putrefaction after you have swallowed it. The effect upon the body is exactly the same as though you had swallowed a putrefying animal. As a matter of fact, the flesh that goes into your stomach is in a state of putrefaction already, when it goes in. As many as 700 million bacteria are found in a small morsel of meat not larger than a teaspoon--just a bit about the size of the tip end of your thumb, 200, 300, and as high as 700,000,000 of bacteria, producing poisons. That is the kind of meat you eat; that is tender beefsteak. If it is cold storage beef, it will have twice as many, or even more, and halibut, and herring, and ~~fisky~~ codfish, and all that sort of thing is simply swarming with germs in countless numbers. Whenever you eat the flesh of a dead animal of any sort, my friends, I would like to have you think of ~~it~~ a dead rat in the closet, because that is the very sort of thing you are eating in a modified form. It has not got quite so far but is on the way to it, and by the time it gets into your colon it will get into the dead rat state, get clear on to the very highest degree of putrefaction.

Now, when one has a crippled liver, you see, which is not able to deal with these poisons, he is in a bad way. Such a liver is not able to deal even with the ordinary poisons that are found in meat. I wonder if there is anybody here that hasn't a crippled liver; I wonder if there is anybody here that has not been abusing his liver for the last ten or fifteen or twenty or 25 years, or fifty years--has not been abusing it in that way. Such a person must certainly have crippled it. I examined today a gentleman whose liver was only half as big as it ought to be. Sometimes it is too big and sometimes the liver is too small. It will first get too big, then will contract until it is too small. It is on the way to destruction, is already in a crippled state. And a person

whose liver has been abused, a man who has smoked for five or ten or fifteen or twenty years, or the man who has been drinking beer, or the woman who has been drinking tea or coffee for five to twenty-five years, has a crippled liver. A person whose bowels have been inactive for years is certainly suffering from a crippled liver; there can be no doubt about it. It just depends on how good care you take of it. I met a gentleman today who said he was here three days four years ago, and we told him how to live, and he had had awful trouble with his stomach, and he went home and never had had that trouble since. I said "Did you live up to the instruction?" "Well," he said, "I didn't eat any meat for four months, but I confess I am getting to be something of a backslider, and I have fallen back since that time. By the way, Doctor, what do you think is the matter with my arm? I have got an awful pain up here, and it feels numb and tingles, and is sore and lame? What do you suppose is the matter with it?" I said, "I guess you have got beefsteak poisoning. It is neuritis as the result of auto-intoxication." Neuritis is a very common beefsteak disease. It is called rheumatism, but it is a different thing from rheumatism, though chronic rheumatism originates very much in the same way. This gentleman had only a couple of days to stay this time, and thought he would get cured up again. Now, he was cured before not by any hocus pocus, or laying on of hands, or any magic we were able to bring to bear upon him, but by the good advice he got and which he followed; and the good advice helped him. The old prophet, you know, said, "Cease to do evil, and learn to do well." That is the secret of getting well--his ceasing to do evil. He ceased to do evil. He found out how to do well and he did it for a little while and got better; then he relapsed, and now he has got something worse than what he had before. It will take a much longer time to get rid of that pain; it may hang on for six months instead of for a few days, in spite of all we can do. I am sorry; but it is a sin of presumption. He knew how to live and didn't do it. He was fond of beefsteak, so he relapsed

and went back to his sins again. I am talking these things in this way because I want your visit here to be of service to you when you go home; I want you to keep on getting better. I feel it a sort of disgrace when a person backslides and goes back.

Another thing that is particularly embarrassing is a person that has been here and been helped once and gone away, been better, then backslid, got down, and then comes back, and when he comes back we can not do as much for that man, or do it as quickly as we did before. They have exhausted some of their vital stamina; the healing power in their bodies is depreciated to some degree. The exhaustion of vitality is like a bank account. Draw your money out and you haven't got it. So whenever you have a recuperative process set up in the body, it restores you to health. When you have been down, been lifted out of a pit, and got up again, something is gone from you; your energy has been lifted up again to some degree, but you can not advance that man so surely, so well. If he gives us a fair chance we can do something for him; but if he has to come back again a third time, he can not expect so much.

I remember very well a man who was with us about a dozen times. He was one of the very first patients I had to do with when I first was connected with the institution about thirty-six years ago. We had only about a dozen patients then, and I could remember them a great deal better than I can now. He was a very prominent banker in Iowa, a partner of a famous Iowa banker who had been secretary of the Interior, and he came here very, very sick. He smoked and ate a great deal of beefsteak, and he was very careless about his diet in every way,--was not a drinking man, and was very careful in his habits in other particulars; but he ate a great deal and was careless in eating. We found him in a very, very bad state; got him on his feet in a few months, and he was happy. He wrote me in three weeks, "Doctor, I am so well I can smoke ten cigars a day and can eat three big beefsteaks a day", and he was as happy as a clam. I wrote

him back that he was dangerously well and would be back here again before long. In six months he was back, and he was so bad off he came pretty nearly ~~lying~~ going to an insane asylum. He had actually to be brought here by a strong man. We got him on his feet again. Now, in the course of twenty years, that man and his wife together spent seven years in this institution, counting them as one person--the two persons together spent seven years in this institution, and it was all due to backsliding. The next to the last time he came, he had been careless about his eating again. He took to his beefsteaks and cane sugar and things, and he had added diabetes to his troubles. The last time he came, he had both diabetes and Bright's disease. The next time he didn't come. He went to the cemetery instead. Now, that man might have been cured and might have remained cured when he got on his feet the first time; he never need to have been sick again; it was a disgrace and a shame. It was simply his cigars and beefsteak and his neglect to do the things he was instructed to do.

Now, my friends, I want to say to you I find it worth my while to do the things I recommend to you to do. I recommend plain living to you,--I live plainer than any of you. I recommend you should not eat beefsteak,--I never ~~touch~~ touch it. I recommend you should not eat mustard, pepper, peppersauce and things of that kind. I would just as soon take arsenic or poison of any other kind as to eat those abominations. I recommend that you chew your food very thoroughly. I am careful to chew my food. I recommend you to eat a low protein dietary. I make my protein very low. I make my protein just as low as I know how. I don't eat anything that has any more protein in it than bread has, and I don't eat very much bread. I eat just about half as much protein as I recommend anybody else to eat. I find most people are afraid of getting their protein too low; but I am trying it, and thriving upon it, and I find myself improving from year to year. I am in better health at this present time than I ever was in my life before. I never knew what it was to feel so full of energy

and snap, and ability to work as I do at the present time; and I am sure it is not because I am eating beefsteaks, for I don't eat beefsteak. I am sure it is not the high protein diet, a rich diet that helps me, because I do not use those things. I lived on a very rich dietary when I was a boy, and until I was about fourteen years old, and my health was wrecked; my digestion was ruined. I was such a puny boy they thought I would not live till I was twenty. Everybody prophesied I would die before I was twenty. I was just thinking as I was coming down to the lecture that those people are nearly all dead; I can hardly remember any of them who are alive that I knew in my boyhood; they have nearly all passed away--men about my own age, grown up, become senile, and broken down in health and passed off the stage; and I find myself still here and able to work; and I am as confident as I am alive that it is due to following a simple dietary, a simple mode of life, unstimulating foodstuffs, obeying the laws of Nature. It pays to be good. I do not know anything that pays better than to be good, to live according to the rules the Almighty made for us when he constructed our bodies.

Here is a ruined liver. Suppose such a man goes to eating beefsteaks; he is just as bad off as that dog that has Eck's fistula, you see. He might just as well cut his throat, about, as to undertake to live on beefsteak. That is a cancerous liver. Here are some more ruined livers. Here is a congested liver, here a cirrhotic liver, a gin liver, a fatty liver, an inflamed liver, a hobnailed liver, a cancerous liver. I operated on a case not very long ago, and found a cancerous liver four times as big as it ought to be. Just think of that woman eating beefsteak. You saw what it did to the dog in the laboratory. It will do the same thing to the woman as to the dog, because her liver was crippled in the same way. I do not suppose there is one person in a thousand that comes to this institution here that does not have a more or less crippled liver; and such persons need to take a diet that will give the liver every chance,

and that will be productive of just as small an amount of poisons in the body as possible.

Here is the thyroid gland which is a poison destroying gland. It aids the liver in destroying poisons. Some poisons pass on through that the liver is not able to destroy, and the thyroid gland helps about that, produces a substance which stimulates the suprarenal capsules of the liver to produce the adrenalin which helps burn up poisons. This gland sometimes gets enlarged. A lady in the house now has one side enormously enlarged, and it has got to be removed, I suppose. We have to remove sometimes a large part of the gland. There are two very common forms of goiter, acute enlargement of the gland or exophthalmic goiter, in which the gland is too active, hyperthyroidism it is sometimes called, sometimes called Graves's disease,--a very rapid pulse, very marked nervous symptoms, protruding eyeballs, and trembling of the fingers, and there are various other symptoms, a rise of temperature and much weakness and perspiration, nervous disturbances of various sorts. This disease is coming to be much more common than formerly. It is increasing in frequency, and the operation performed is to remove a part of the gland. That is the operation that is done for relief of this condition. It is caused by an excess of these poisons and a meat diet is largely responsible for it. It may be an inactive state of the bowels flooding the body with poisons so that the gland is over excited and becomes enlarged. A man came to my office to see me about his wife's case today, and I noticed he had an enormous red nose, a nose enormously enlarged and very red; he had a characteristic rum blossom, and I know what made it in that particular case, too. It is rather an open secret what makes rum blossoms. The reason why this man's nose was red was it had grown too big for the rest of the face, because the blood vessels of his nose had been stimulated; the vasomotor centers had been stimulated by alcohol, and that caused relaxation of the

blood vessels of the nose, and there had been too much blood brought there and it had grown too fast for the rest of his face.

A similar condition prevails in the thyroid gland when toxins absorbed from the colon are present in large numbers; the gland is over-excited, and they become enlarged, filled with blood, and they send into the blood too large an amount of their secretion, thyroïdin, and that excites and disturbs the entire body. The usual remedy is to cut off a part of the gland. That leaves only a part of the gland behind, and the same influences continuing, this gland is influenced still more, and the remaining part is very liable to undergo degeneration, almost certain sooner or later to undergo degeneration. This degeneration which takes place by and by leaves the person without the thyroid gland, so the poisons will be left to accumulate in the body, a condition known as myxedema is produced--a condition which is much more serious than the first condition. So the thing that needs to be done is not simply to operate upon the gland, which is sometimes necessary, but to change the dietary, to correct the habits, to remove the cause of this condition. There is the suprarenal capsule that we have been talking about that makes the adrenalin and helps to burn up poisons; and here are the kidneys that have to do that elimination of poisons. This is the filtering part of the liver through which the waste matters are filtered out and pass down through the kidney and this part of the body. Now, if one takes into the body too large an amount of poisons, the kidney is overworked as well as the liver and too large a quantity of these poisons is thrown down through the liver, coming in contact with the liver cells so they are spoiled and the liver itself undergoes a degenerative process.

Here is a fatty liver; here is a beer drinker's liver, and a gin drinker's liver. These are rather characteristic. This is the kidney of a man who has been using alcohol or whiskey; or ~~tea~~ of a woman who has been using tea or coffee for a good many years; the kidneys of such a person are certain to be

crippled. Now, if we want to maintain this overworked kidney and liver, we must give them an easy time. A man can live as long as the kidney and the liver and other excretory organs are able to keep the blood clean--the man can generally live. If the kidneys get worn out, the man must die, no matter what his age is. If the liver gives out, the man must die no matter what his age. But even the man with the old liver and the old kidneys can manage to eke out an existence for a long time by taking extra good care of his liver and kidneys. That is the thing I want to impress upon your minds, my friends--that by extraordinary care in living, by doing works of supererogation, it is possible to take such care of our damaged, abused, crippled kidneys that they will still do service for a long time, even greater than might be predicted.

Here is the colon showing its position as it is found in a normal state. Here is the sigmoid flexure. Here is an X ray picture, a radiograph of a colon. By giving the patient some yogurt with some bismuth in it, the colon is made visible to the X ray, so we are able to take a picture of it as you see here. Here is where it lies up next to the liver, but it has fallen down a little here. Here is a little loop that goes clear up to the diaphragm, and ~~xxx~~ when it comes down here, you see, it makes a great loop here. It comes down here, makes a fold backward, and another one ~~x~~ here and several loops here. When the colon becomes elongated, as it is here, and folded over on itself so many times, it is certain to be a difficult colon to manage, because the contents of the colon are retained. Then it is very hard for the colon to pass them along. Suppose you take a rubber tube and fold it; you know the tube collapses, folds upon itself. Here is another corner where there is a collapse and there are some more here. So when the excretory matter is passed into the colon, it passes along up to these points, and then it is stopped for a long time, and after while passes over here and remains here, and when the pressure is sufficient, then it is driven over. This is the source of a tremendous amount

of trouble when the colon becomes prolapsed and elongated, as the consequence of chronic disease. In such cases it is necessary to take great care to maintain the contents of the colon in a moist state. That is why we recommend Colax, or agar-agar, Japanese seaweed, and the bran biscuit, sterilized bran and other similar preparations,--that is why we recommend lettuce and a great deal of greenstuff, and fresh vegetables for persons suffering with this sort of trouble--so the colon will have sufficient material to spread out these folds so there will be sufficient bulk in the bowel to stimulate it to contract with sufficient vigor to force the contents along in spite of the folds. This is a practical demonstration of this difficulty which is so common in people who have relaxed abdominal muscles, people who have neglected to develop the abdominal muscles, and who are sedentary, and the colon gets into all sorts of tangles.

Here is another illustration of the same thing as a result of the retention of these decomposable matters in the colon, and bacteria of various sorts are enabled to grow there. These are putrefactive bacteria which you see here. That is the way it looked under the microscope, and they are growing in great numbers. In this case, 95% of the bacteria were of the putrefactive sort. You see they are blue in this picture, and these are the friendly germs, which produce acids, whereas the red ones produce poisons in the alimentary canal, poisons of an alkaline character, produce ammonia, ptomaines, indol, skatol, and other bad smelling, offensive things. Now, these poisons produced by decomposition going on in the colon in that way, poison the blood, and these blood cells that have the duty of getting out into the tissues and capturing the germs and eating them up, they become paralyzed so that they can not do their work; then the person gets a little cut, perhaps, and it suppurates, does not heal. I was examining a patient today who had just a little puncture on his finger last year and it suppurated until he had to have his hand and arm lanced,

because blood poisoning had set in, and he was ten weeks getting over it. If his blood had been right, he would not have had any trouble at all. Unfortunately, he did not recognize the significance of this incident, so he did not go to work at once to purify his blood. He was suffering from chronic stasis in the colon, poisons were being absorbed into the blood, and the body was saturated with poisons. Now, we find he has Bright's disease; his legs are swollen up with dropsy, and there is albumin and casts, loss of power to eliminate chlorid of sodium so this is accumulating in his body and he has got dropsy, and his chances of recovery are very, very slim. I think he will get up once more, and he may still live a good many years, ~~xxxx~~ of useful life; but it will be the easiest thing in the world to get down again. And if he once more gets down, he will never again get up. That is when these blood cells are not able to fight for the body, are not able to destroy germs, they become instead a menace to the body, because when they are not able to fight, to defend the body, some of them attack the body, attack the brain and eat it up, attack the spinal cord and other parts.

This is Prof. Metchnikoff who made this remarkable discovery I have just stated; he studied these cells in the Pasteur Institute, of Paris. I met him four years ago in visiting the Pasteur Institute, and we have a man now here visiting us who spent some time in the Pasteur Institute, studying, and he is perhaps better acquainted with this man than we are. Dr. Metchnikoff has made the remarkable discovery that these blood cells are the defenders of the body, and their ability to defend the body depends upon keeping the body clean and pure, and when we allow the blood to get unclean so the breath smells bad, and the skin becomes dingy and pigmented and brown circles form around the eyes, and brown spots form on your hands,--that means your body is being saturated with poisons, and when we allow the blood to get so contaminated as this, to have a bad taste in the mouth, and a coated tongue, and a foul odor, an offensive

odor in the bowel discharges, that means generally auto-intoxication, and means a polluted state of the blood, means paralyzed body defenders, means we ought to be doing something straight away, or Bright's disease, or liver disease, or arteriosclerosis, hardening of the arteries, or some other mischief will be soon making itself apparent.

Here is Mr. Fletcher. He doesn't look so very old. A few years ago he could not get life insurance because he was in such a miserable state. But after taking pains to eat properly, taking pains to chew his food thoroughly, every morsel he ate, he succeeded in improving his state of health to such a degree he didn't have any difficulty in getting all the life insurance he wanted, and he has really been rejuvenated. Here he is making a great leap over the water, going down into the water feet first with all the precision of a youngster, although he had not practiced the feat for more than forty years, he did not have the slightest difficulty in turning this summersault in the air, and doing feats that are very difficult even for young people.

Notice this table showing the bacteria in meat. Four hundred and twenty millions in a little piece of not as big as your thumb of sausage. Small sausage had half as many more. Round steak had 560,000,000; roast beef 560 millions; well done tenderloin had 55 millions, and tenderloin rare had 168 millions; so you see cooking does not destroy these germs. For instance, there were a billion germs in a quarter of a dram of pork the next day after it was brought to the laboratory. These were portions of meat brought up here to our laboratory for examination by the chef of the Post Tavern. The chef was making some studies in chemistry in our laboratory, so we asked him to bring along some meat as he served it at the table, just as he served it. This was the result. So you see what the people at Post Tavern are eating. If you go down there somewhere to get a square meal, you can see what you will get.

I have known people to do such things before now. But Post Tavern diet is just as good as any other hotel diet in the country. I must not neglect to say that. The tender meat you buy in the market is always well advanced in decay. Sometimes you ~~have~~ will be sure to get it all right, and you will take the oysters alive on the half shell before they have a chance to undergo putrefaction. Did you ever think of the oyster's anatomy? He hasn't got any eyes, but he has got a whole lot of other things, liver, kidneys, small intestines, stomach and an enormous mouth; and these are the gills, and the bacteria gather in great numbers in these gills, and they are always found present in the oyster. The next time you take a live oyster on the half shell and masticate him, just think of what a delightful morsel it is. Now, let me see, this is the head--hot nice it is. This is its brain--what little it has; here is its spinal cord if he has any. Here is his liver and kidney; this is small intestine. Now, isn't that interesting to think of--taking a live creature and chewing him up just as though a big Cyclops got hold of you and swallowed you alive, masticated you while you were still alive and quivering? Think of swallowing a live beast, alive and kicking. That is the way the live oyster goes down. If we had never seen an oyster eaten alive, and somebody should come here and undertake to introduce the practice into this country, it would be condemned as cruelty to animals, and as most inhuman and monstrous. Now, the oyster, then, is alive; it has not undergone decomposition yet, perhaps on the halfshell, alive and kicking, as I was saying; still is just as bad as the rest, I think, because he lives on germs, and has got his stomach full of the very worst kind of germs, so when you swallow him stomach and all, including the last dinner he ate, you have got yourself well infected. And there is no improvement.

Now, how strange it is that we should abuse this marvelous machine of ours; how strange it is that we should abuse this wonderful body of ours that has been created for such high purposes; that has such a marvelous intelligence

at work within it all the time. Here is an illustration of it. A baby swallows a stickpin. We think the baby is going to die sure. It is not at all likely the baby will die because it swallowed that stickpin. When it goes down into the baby's stomach, you can almost guarantee that nothing serious will happen. Prof. Roger, of Paris, made a careful study of this question in animals and found this: The stick pin begins to penetrate the wall of the intestine, and immediately the wall begins to grow thick, and it thickens up so fast the pin does not get through, and the wall begins to push up, press up around that pin so that it stands up straight, and by and by it begins to be pushed over, and in the course of a few minutes it has got ~~xxxx~~ the pin pushed clear over so that it is going down stream, and everything is all right. Now, isn't that a wonderful thing? That thing happens when all the nerve that connect the intestine with the brain are cut off so there are no nerves connected with the brain at all. This is thing is automatic; so you see what a marvelous intelligence there is at work within us; and this intelligence is able to remedy wonderful defects. It is able to correct terrible conditions of disease. It is this power that brings us back to health again. The same power that knows what to do with that pin knows what to do with ulcer of the stomach; it knows what to do with that diseased liver; it knows what to do with diseased kidneys, or any other conditions. It works for that man. It works at night. Here is something that works while you are awake, and that works while you are asleep, that is all the time intelligently working to do the very best possible thing for us. We ought to cooperate, don't you think, when we have such a beneficent power as that working for us, we ought to do the best we can; but we don't. We put as many obstacles in the way as possible.

Here is another thing. This is the apron that hangs down in front of the abdomen, the outside of the abdominal wall known to butchers as the call. It is the omentum, the anatomists call it--simply a thin membrane with some fat in

it, and blood vessels and lymphatics; it has a most wonderful function in the body. It is called the abdominal doctor, because it carries help where it is needed. Here is where the appendix is. It gets infected, and the omentum comes down and wraps itself right around that appendix so if the appendix should suppurate and burst, the pus won't get out into the abdominal cavity. There is not much danger from appendicitis if we let it alone, because this abdominal doctor is there and knows what to do. Maybe there is trouble with gallstones up here. Many a time I have operated upon the gall-bladder and found this abdominal doctor here, actually turned clear over and climbed up there and wrapped itself around the gallbladder. In case the gallbladder had ruptured half a dozen gall stones might be let out into the abdominal cavity, and no harm would be done because this omentum would wrap itself all around them, and it had wrapped itself around the gallbladder and made a pocket there, and those stones would be let through into that pocket, and not the least bit of harm would be done. I took the gallstones out and the patient made a perfectly good recovery, lives in this town now, and is a healthy, happy, robust woman. There were only 107 gallstones. The omentum had by this marvelous intelligence which it has, wrapped itself around; and it moves about from one part to another where it is needed, and had taken care of this case and saved the woman's life. We depend upon this abdominal doctor to a wonderful degree. Yesterday I operated upon a lady's stomach, to make a new pylorus for her, to attach the intestine at another place so food could pass through and pass by the obstruction there. The last thing I did before closing up the abdominal wall was to bring in the abdominal doctor, hold it up there where it was wanted, and fold it down over my operation so as to be right handy by to begin business to take care of that ugly wound I had made. The patient is getting on tip top today, slept fairly well last night, and in a week or so you will see her out in a wheelchair here all right, and her troubles will be gone. And the reason my operation did not kill her is because

this abdominal doctor was on hand to take care of her. My friends, it is simply marvelous. I wish I had an hour or two to tell you of these wonderful things that are going on in the body as the result of the intelligent co-operation of the Power that is within us, which is the identical power that made us; it is the same Power that made us in the first place, and it is still with us, looking after us, taking care of us. And how we ought to co-operate. I was going to tell you some other things, but we will leave them to another time. I will now show you some of the mischievous things the fly does. It will give you a history of the fly and show you some of the horrible things the house fly is about, so you will be quite interested when you go home to protect your house and food and babies, and everything in the home from the most dangerous objects with which we come in contact, the common fly. I don't know of anything so dangerous; but now I will stop talking as the pictures will tell their own story.

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THE MIRACLE OF HEALING

A Lecture At the Sanitarium Parlor, Battle Creek, Mich., Sabbath, May 20, 1911,

At 8:00 P. M., By

J.H. Kellogg, M.D.

The healing of disease has always been a mystery. The earliest people looked upon disease as an infliction coming either from a divine source or from an evil source. When a man was sick, it was either because God or the devil made him sick. And the gods must be placated, or the devil must be in some way cajoled into letting him alone. So the old methods of healing, based upon that philosophy, consisted chiefly of magic of various sorts. There were certain places, certain springs, that were supposed to possess this magic ability to charm away disease. There were certain herbs supposed to have the power to persuade the devil or demon in the man to leave him, so these herbs were sometimes burned and brought near the nostrils of the sick man, then carried away and brought back again, and so again and again, with the hope that the devil might be coaxed out. Sickness was supposed to be a demoniacal possession, and the demon must be in some way induced to leave.

This idea in a modified form is still alive in the world. After while, in some way, the idea came into being that certain drugs possessed the power of exorcising the diseased entity out of the patient. The disease was still looked upon as an entity; but when the superstitions of the early days and the Dark Ages began to leave the human mind, people more and more became possessed of the idea that disease was an entity of some sort, if not an intelligence, if not a demon, it was still an entity of some sort that must be driven out, an entity that must be battled with. And so it had to be attacked in various ways.

Doctors 200 or 300 years ago used to attack disease so vigorously that sometimes there wasn't much left of the patient when the battle was over, and it is quite possible that that might happen even in these latter days. It is a thing the doctor always has to be on the lookout for, that the remedies he administers are not possibly doing his patient as much harm as good. And the wise doctor is always careful upon that point. He takes care that what he does will do no harm, if it does not do very much good.

By degrees, better ideas of disease have come into being. At the present time people are losing their faith in drugs more and more, and doctors are using drugs less and less, and this has come about by a recognition of the real nature of disease. Disease is no longer looked upon as an entity, something malign that has got possession of a man and is sapping his life; something that must be destroyed; but disease now is looked upon as a natural process; it is rightfully regarded as a natural process, a process by which the body is seeking to bring itself back to a normal state. This is the result of some departure from the normal condition of life. It is the same forces of the body which are ordinarily in operation, but in operation under adverse circumstances. That is what we call disease. When the body is doing thing in a state of disease, it is not doing anything which it is not ordinarily doing, but may be doing it in a different way, different from its ordinary process; but it is only such a different process or different action as is required by the emergency that the disease has itself developed.

We might illustrate this in a great many ways, but I want to impress another thought, so I will hasten on. We find the remedial process, the cure of disease or morbid conditions, is not confined to human beings; it is not confined to animals either; it is a thing which pertains to all life of all sorts, vegetable life as well as animal life. Tear off the limb of a tree. In due time in most instances, you will find that the wound has been healed over. As I was

coming down here a few moments ago, I passed a tree upon my lawn that I had set out some 17 or 18 years ago, and the next year after I set it out, I was very much distressed to find that because of an oversight of the gardener on a very hot day, the bark on one side of the tree was blistered, so the bark was dead on one side of the tree. A friend said that that tree would die, that I must take it up; but I passed it today, and it is a large, fine tree with a trunk nearly a foot in diameter, and the place where one half the bark had come off was all covered with bark. New bark has grown out around the tree, and the edges of the bark gradually grew together until the trunk of the tree is entirely covered, and it is a large, splendid, healthy, vigorous tree. It has been cured, it has been healed by the same process that is making the tree. The same process that is creating the tree has been at work healing the tree.

Now, the very same thing happens to ourselves sometimes. Our covering skin--the bark of the body we might call it, gets wounded. Here is a cut in the skin, or a burn perhaps, that takes off a square foot of skin. In due time it is covered over, not with new skin entirely in this case; we do not get exactly a healthy, normal skin, but it is a covering, a protective covering which takes the place of the skin very well. It doesn't do to have the entire body covered with that kind of skin, but it answers very well to cover over this raw surface at any rate. We do not find the hair growing upon it; we do not find the sweat glands growing in it; we find it differs in quite a number of particulars, so it is not like the ordinary skin, but it ~~heals~~ heals over. If we look at the edge we can see it is healing, we can see that there is a little white rim around the edge. Each day we will see it approach the center a little more and a little more, and in due time it is covered over. We have various "healing things" that we talk about that we apply, healing salves, healing lotions of various sorts that we put on wounds that many people have very great faith in,

but none of these are capable of healing. If we stop to think of it, we know there is no such thing as salve that can heal or can make skin. Suppose, for instance, one of these things that is supposed to be so healing should be rubbed on a table or a board somewhere. We would not see anything growing there, or any skin produced, or any evidence of life or activity. So these so-called healing things do not heal; they only protect. There is nothing anything can do to a raw surface on the skin except protect it. The healing process is a process by which new skin is created, or by which a new covering is formed to protect this raw surface. So, if we have a cut and there is a gap in the skin, in a little while we find it healed up. And it has been a mystery through all the ages why this healing takes place. Here is, then, a normal skin, the cells pursuing normal activities; we cut the skin and there is a gap there. At once these cells begin to grow, to reproduce themselves with great activity. Cell proliferation, as it is called, takes place, and the cells grow, and in a little while the gap is filled up. Why does this occur? Why does this gap close up in this way? Why do these cells take on this hyperactivity as soon as a wound of that sort occurs? Nobody ever knew until just the other day. Dr. Ross, of Liverpool, who has been studying this question for a good many years, made the discovery the other day that the thing that starts this process of healing is the dead cells. It is the destroyed tissues, the disintegrated flesh. The living cells are destroyed by the wound, and the products of the destruction of these cells act as a stimulus to the living cells and cause them to take on this extraordinary activity. So we see these cells are ready to do something which they are not doing if they have a right kind of stimulus. All they require is notification of the right kind. There is an instinct within them which causes them to heal a wound, when healing of a wound is needed, and all they require is notification, and the notification which comes to them is the most natural

thing in the world. It is the natural product of the wound itself. The product of the destroyed cells are a notification to the living cells that there is work now for them to do in repairing damage that has been done. This is a very interesting discovery made by Dr. Ross, and by means of this discovery, he was able to look through a microscope and see living cells at work, dividing and multiplying. It was the very first time in the whole history of the world that the white blood cells were seen to divide and multiply right under the eye of the observer, under the stimulus of these products of tissue destruction. So we begin to know a little more about these secret processes than we have known before; so the mystery is to some degree being removed; but down beneath it all the great mystery still remains.

What is it in the cell that causes it to behave in such a different way from its ordinary method of work? There are the cells, remaining quiet in the skin, and all of a sudden, under this new stimulus, they begin to grow and multiply, reproduce themselves to an enormous degree. Sometimes patients persons have lost as much as one third of the entire surface of the body, and that would mean a couple of square feet perhaps, and that two square feet had to be reproduced. See what a tremendous work it is that these cells have to do. It is an extraordinary work; it is a sort of emergency work, something entirely different from what they are ordinarily doing. Now, we see that illustrated in quite a good many observations that are made by the biologist. Here is a lobster, for example, that loses its leg; gets into a fight with another lobster, and one of its legs is pulled off, or maybe two or three. In six weeks he will have three new legs just as big and in every way just as good as those were. He has got perhaps a whole new set of legs. It sometimes happens that a lobster gets very much frightened and shakes his legs all off through fear; or maybe he becomes angry at something and tears them off. He throws his legs away on the slightest provocation, perhaps because he has learned from experience that

he will get a new set of legs. I have seen some people who behaved just about as reasonably as a lobster. They throw away their livers, and throw away their stomachs, throw away their nerve energy, live in a great variety of ways recklessly; but they do not get it back again as easily as a lobster. If a man cut off a finger, he does not have a new finger grown on. But a lobster and other lower orders of life, the jellyfish, for example, and the earthworm, have this power of reproduction of lost parts to a marvelous degree. Cut an earthworm in two, and one half will grow on a head and the other half a tail, and you have got two worms instead of one. Take a jellyfish, chop it up into a thousand pieces, and each one becomes a complete jellyfish and sails off in the water about its business, and becomes another separate, distinct fish.

There is something of this power in the human body. The liver, for instance, has a marvelous power to reproduce itself. A German physiologist took a rabbit and cut off half its liver, and it grew on again in the course of three months; then he cut off the other half, and it grew on; so the rabbit in the course of half a year, had a brand new liver. That is what a good many people need--reconstructed livers; and not only that, but reconstruction of the whole body. Now, fortunately, there is a process of repair going on in the body, a process of change going ~~through the body~~ on by means of which the body is reproduced. The soft parts of the body are changed perhaps every few months. The greater part of the tissues are undergoing continual change. The hard parts change very slowly, but the soft parts change very rapidly. The blood, of which we have about ten pints in our veins, in a person of average size,--this blood is changed every six weeks. That is, the blood cells are all made over new every six weeks, and the watery part of the blood, the lymph, the plasma of the blood is changed much more often than that; but the blood cells are all new. Through this process, recreation and reproduction are going on in the body continually. Eight million new blood cells are made every second of our lives--think of it--

eight million new blood cells are made every second of our lives, created every second of our lives. This process of re-creation, of reproduction is continually going on. The old is wearing off, being cast out, and the new is being produced and built up. This is a process of creation, then, you see, going on within us continually. We think of creation as something that happened away back somewhere in the ages, away back in the beginning of things; but that is not the place to look for creation. That is so far back we do not know just when it was, and we haven't got any very exact, authentic record of exactly how things happened at the creation; but the creation that ought to interest us, that is ~~the~~ of vital importance to us is the creation that is going on right now, here, at present, right before our eyes; a process that is going on continually, that we can look at and see with our eyes.

Here is an illustration of it that you see going on right along-- the farmers going out planting. In a few days the farmers will be planting their corn all about here, and we will see a farmer going out with a bushel of corn on his shoulder, and next fall, we will wait just a few weeks and we will see that same farmer out there with horses and wagons hauling in the corn that is grown from that one bushel. Five hundred bushels of corn, perhaps, will be got back where only one bushel went out. Now, that 499 bushels of corn have been created. Every one of the kernels of corn in that 500 bushels, every kernel has just as much vigor and vitality, weighs just as much, and is in every way equal to the kernels of corn that went out; so you see there is a creation. I was riding out some years ago and passed a long row of magnificent trees, perhaps twenty-five or thirty beautiful trees stood in front of a man's farm--enormous, great maple trees, and I could not begin to reach around them. A friend of mine who was well acquainted with the country, told me he knew the farmer who lived behind those trees, and that that farmer fifty years ago went to the woods and gathered up those trees, then little bits of sprouts, just little bits of scrubs, dug

them out of the earth, brought them all in on his shoulder, all on one shoulder. Now, it would take several yoke of oxen to haul one of those trees at the present time. There has been a tremendous increase of tree substance, and it has been done by a process of creation, by real reconstruction, and re-making, and reproducing.

The process of eating is a real process of creation. The food we eat at our tables, this food is dead, it is inert. The bread and the potatoes and all the rest of the things we eat if left there upon the table would soon pass into decay. We eat them, they are created into our bodies, they are transmuted. It is like making gold out of lead; they are transfigured; more than that, because the food we eat today tomorrow will be walking around and talking, will be alive, and thinking, sentient, full of force and energy, while today it is dead and inert. So here is a process of creation, a marvelous process. We may call it the miracle of life if you please, because there are so many things that are absolutely inexplicable. The only explanation of the mystery is this: that the same Power that made us in the first place, the same Power that made the first man, the first living thing,--that Power, that supreme Power that sustains the universe, that Power is still in us, working in us; it dwells within us; it is incarnate if you please, in every soul and every fiber of our bodies. The power which made Adam in the first place had to stay with Adam to keep him alive. Adam had to be recreated every second. He needs the stream of life continually pouring into him, and he needs a continual impulse, an intelligent impulse to control the conditions of the body, of every cell, of every function, in order to keep it going. The human machine, the living machine, whether it is animal or vegetable, is so marvelous, so intricate it can not run all by itself alone, but it requires continual supervision, continual control. John Fisk said that when he was a boy his idea of God was of a great Being somewhere that away back in the beginning had sometime made the world and the universe, and set it

going, and then went off somewhere and sat down to see it go, and had not had much to do with it since.

Now, I really think it is that idea that gets into the minds of the majority of people who think crudely in relation to this matter; and the majority of people in thinking about the cosmos, in thinking about cosmos and about the genesis of things rarely ever get beyond the kindergarten stage. I think most people think in kindergarten terms with reference to the origins of things. That was John Fisk's idea when he was a boy. He got a better idea before he got through. It is necessary for us to cast these ideas off in the presence of the results of modern research and inquiry; it is necessary for us to recognize the fact that the power that made us is still with us. It did not make us and then set us adrift, but it stayed with us and must stay with us so long as life lasts, the supreme Power that created us is right with us all the time, and supervising every function of our bodies. Now, the miracle of healing is really nothing more than the miracle of life. The same Power that created us has not deserted us when we are sick; it remains with us. Healing is not very different from creating, from what is going on continually.

As a simple illustration of that, we might think of digestion, for example. A man eats his breakfast. If we could look into his stomach before he ate that breakfast, we could see it was pale. Dr. Beaumont had an opportunity, you know, to study the inside of a man's stomach ~~xxx~~ through a little window a man accidentally made when he went out hunting. There was a window left in his stomach, so he could look in and see what was going on. He could see the mucous membrane there, and it was pale. After the man swallowed a few mouthfuls of food the whole mucous membrane of the stomach became red almost with a bloodshot appearance, became congested and red, and pretty soon the gastric juice began to pour out in drops as perspiration sometimes starts from the brow. The process

of digestion was begun. Now, every time a person eats, then, his stomach becomes congested. He gets congestion of the stomach, too much blood in the stomach. If a person eats continually, this condition of congestion will become permanent, and people sometimes by overeating, by too frequent eating, by abusing their stomachs, the stomachs get after while into a state of permanent congestion, but the normal way is for a man after he has eaten to rest for a while and give his stomach a chance to rest; and in this period of rest, the stomach is restored, the congestion is removed, the stomach returns to its normal state. Now, the stomach has little pockets in it, and these little pockets are lined with curious cells, and in each one of these cells is a large number of little granules, and each one of these granules is stored up energy. The little cells are packed full of these granules. Every cell has a little center called the nucleus, and these granules are packed in the cells so thick you can not see the nucleus, or can hardly see it at all; but it is all covered up. But after the stomach has been working for some time, these granules disappear, and the cells become pale. The store of energy which was gathered in there has been spent. While the stomach rests between meals, these granules re-appear, they are gradually gathered in again.

Now, there is a process of rebuilding, there is a process of creation, by which these granules are created where they did not exist before; so the cells acquire a store of energy. The stomach that has been digesting a meal for several hours becomes in a certain sense sick, becomes fatigued, tired, and it needs to be restored, and this process of restoring is a kind of healing, because if the work is repeated again and again and again without any opportunity for rest, there becomes finally a state of permanent crippling, and injury, and the stomach is diseased.

The very same thing is true of muscle work. Hard work wears out the

muscle. Rest and sleep is a healing process by which the worn, fatigued parts are recreated, restored to their normal state again.

Now, what we call disease is something a little different from the conditions that ordinarily occur in our ordinary lives. It is somewhat different, but it does not differ so very much after all. It is really not very different in kind. It is only the extension of the same thing. Here is a man who says he is neurasthenic. He says he feels exhausted. Somebody was asking me some time ago if I really ever had any experience, if I really knew anything about a how neurasthenic man felt; and I said sure I did, for I had had neurasthenia myself very, very bad. "Is that so?" "Yes," I said, "I have had it a great many times. I have worked all day, and worked most all night, perhaps, or all night and the next day and half the next night, and along about three o'clock in the morning, I got dreadfully neurasthenic. I get into a state of terrible neurasthenia, but I get a chance to go to bed and sleep, and in a few hours I am cured." So I have had a good many experiences with nervous exhaustion; but that the man that calls himself a neurasthenic, or becomes neurasthenic does not get cured when he sleeps; that is the difference. He has to have more than one night's sleep to cure him. Fatigue and work exhaustion are cured by rest. When a man gets neurasthenic, he has gotten to a state where he can not rest; he has gotten to a condition where he is not cured by sleep and by rest. He is in a state of chronic weariness, a state of chronic exhaustion. All his trouble is that he has lost the power to store up those little granules of energy; he can not accumulate energy; there are toxins in his body, poisons which paralyze his nerve centers and so inhibit the activities which otherwise he might be capable of.

Now, I mention these illustrations so you will get the idea, if I can possibly convey it to you, that disease is not a thing so far different from the things which we experience in our every-day lives; it is only the natural forces of the body operating under unnatural conditions. It is the body seeking to carry a load heavier than it ought to be able to carry. A man says he is

bilious, for example. Now, he is not bilious because his liver has ceased to act; but he is bilious only because the poisons have accumulated in his body ~~until~~ in such enormous amount that the liver is not able to deal with them all, is not able to keep the blood clean and pure, and so to keep the body in a normal state. Now, what that man wants is not something to repair his liver; what he wants is to lessen the work of his liver, to ^{remove} ~~manufacture~~ these poisons, to cease producing them so that the liver will not have this abnormal work to do.

Suppose a man has a fever. We used to think fever was a thing that was to be combated. Now we know that a fever is curative. For instance, if a child has diphtheria, gets a rise of temperature, the purpose of that rise of temperature is to cure the child. The fever is curative; it is necessary. A child with diphtheria without any fever is in a great deal more serious condition than a child with diphtheria with the fever, because fever is a healing process. Under the influence of fever, or rise of temperature, the bacteria can be destroyed, and this elevation of the temperature is one of the things necessary for the destruction of the bacteria, the infection which is making the child sick. The most wonderful thing we see connected with disease is the manner in which the body adapts itself to emergencies. A very good illustration of that is what occurs, for example, when a nerve is cut. Now, it used to be supposed that when a nerve trunk was cut--suppose my fingers represent the fibers of a nerve, and the nerve has been cut so they are separated. Now, the old idea was that the only way in which that nerve could be restored was by starting at the root, beginning and growing out the whole length of the nerve, because nobody could see how it was possible for all these delicate little fibers which make up the nerve, perhaps one twenty thousandth of an inch in diameter--how it was possible for them ever to get matched together again so that the right ones were joined. You can see what would happen if a nerve from the little finger joined a nerve to the thumb. If you wanted to move the little finger, it would be the

thumb that would work instead; so things would be badly mixed up. Suppose we had to start clear back at the beginning and form a new nerve. That is the old supposition. But more recent observations have shown that the nerve may actually be repaired; and that in this bundle, perhaps 10000 minute filaments each one twenty thousandth of an inch in diameter,--perhaps in that great multitude of diverse filaments each one finds its mate. Now, think what a wonderful thing that is. The process is described by histologists who have studied it, something like this. Here is a telephone wire cable, and the cable is broken. Perhaps there are a hundred different wires in that cable. How are they all to be matched together again? It is quite a job to get them all together. But now suppose such a thing as that happened. You would see the two ends hanging down here, and all of a sudden, you should see one of the copper wires in one end of the cable growing out into the air, moving about in various ways, and touching the wires in the other end of the cable and finally fixing itself to one of them and growing fast there. That is exactly what happens when a nerve is cut. These filaments grow out, examine, test out each one of the different corresponding nerve filaments in the other part, and finally attach themselves. Each filament attaches itself to its mate. And in that way the repair is effected. Now, one can readily see that such a thing could not happen without intelligent control. And it must be an Intelligence that is looking after this thing. In the process of repair, there must be an intelligent control of each of these active elements. When the skin has been torn off and a new skin is formed, a new skin has been created to cover that raw surface. When a nerve repairs itself, it is because there is an Intelligence at work superintending that repair. Now, the same thing is true in every part of the body where there is a healing process going on. For instance, here is a man gets pneumonia, or suppose it is appendicitis. That patient comes with pain in his side, and we send him to bed, get a drop of his blood, examine that blood, and we can tell

by the examination, in part, whether that patient is going to require an operation or not. Because in the blood there are certain cells the duty of which is to fight germs. And when these cells are present only in normal number, and the patient has a pain in his side, we are not afraid of very profound infection. If we make another examination and find these cells present in the blood in double the ordinary number, then we know that there are infectious germs there, and mischief going on, and we must watch it sharp; and the next day we examine it and we find perhaps three times the ordinary number, and then we know that infection is severe so that it will be a good plan, perhaps, to do an operation right away quick. But when anybody is cured of it without the operation, it is this reproduction of germ-destroying cells in the blood.

Here is a man who has pneumonia. Examine his blood, and we find perhaps the ordinary number, six or seven thousand white cells in a little drop of blood; in two or three hours he will have a hard chill, and he gets up to twenty-five or thirty thousand instead of six or seven thousand, and perhaps at the end of 24 or 48 hours it may be 100,000. The cells are enormously multiplied. We make another examination and find fifteen or twenty billions of new cells have been created in the blood, on the spot, for the purpose of saving this man's life. In pneumonia there is an infection of the body. We used to think pneumonia was a disease of the lungs, but now we know better. It is a disease of the whole body, a general infection with a local manifestation. But the entire body is sick, and the infection is affecting the entire body, influencing it, and here are these little blood cells multiplied in enormous numbers for the purpose of fighting off these germs. If the number produced is sufficient to destroy the germs, then the patient recovers, and by frequent examination of the blood it is possible to tell how the battle is going, just as possible as it is for the general to stand off on a hill somewhere and watch the contending armies with a telescope--it is possible for him to tell whether

his forces are being weakened or are gaining ground. So, by examination of the blood, the intelligent, up-to-date physician can tell just how the battle is going in a case of pneumonia.

Here is a man who has typhoid fever. He lies there day after day, week after week. We see him going down, getting thinner, his tongue coated, his fever running 101°, 102°, and sometimes considerably higher than that, and day by day we see the patient apparently going down; he goes down two or three weeks, possibly four weeks, then all of a sudden he begins to come up. Now, after a patient has once got down so far, why doesn't he keep on going down? Why does the change come after three or four weeks, or two or three weeks? Why does he begin to come up? Why doesn't he keep right on going down?

When a man has cancer, there isn't any change of that sort. When a person has malarial fever, as a rule, there isn't any change of that sort unless there is something done for him; he is likely to keep on going down; but this man with typhoid fever, at the end of two or three weeks, we find him coming up again. It doesn't always happen so, but that is the usual way. A careful study of this matter has shown that when the patient has gone on with this disease, typhoid fever, for two or three weeks, there is a change in the body. The body has produced certain substances in the blood which are antidotes for the poisons of the typhoid fever; certain new bodies are present that were not there before, so the typhoid fever germ will no longer grow and flourish in the blood, can no longer manufacture these toxins, and the germ is weakened and killed off; at any rate, if the germ is killed off its toxins are neutralized to such a degree that the man can recover. So he does recover. And after he has once had typhoid fever in this way he is changed; he is different from the man he was before; he is not likely to have typhoid fever again, because the body has learned something, so to speak; it has acquired the power of fighting typhoid fever germs, and has acquired the ability to produce certain substances which were

introduced during the typhoid fever; and in this way the man's life is saved.

Now, what a marvelous illustration this is, my friends, of an intelligent act within the body to bring in an emergency procedure. It requires something that you and I can not do, something more than human power. The same power that created the first man has now created within the body an antidotal substance by which the man has become changed, so that the typhoid fever is no longer able to progress; the tissues are able to fight the typhoid fever. The very same thing happens when a man gets small-pox. Small-pox germs get into his body and the man is going down day after day, and by and by comes a change upward. A point is reached where the body produces in sufficient quantity these antidoting toxins whereby the poisons can be combated. The same thing happens in diphtheria when recovery occurs, and advantage has been taken of this by an ingenious scientist, Prof. Ehrlich, to produce a condition in the blood of a horse in which there is a tremendous power, an unusual and extraordinary power of resisting diphtheria. Inject some of the poison into the horse and in a short time, he injects some more, and more and more, until after while it is possible to inject into the horse's blood a thousand times as much poison as would have killed him at the first. His blood acquires the power of resistance to the extent of a thousand times what it had in the first place. So a small portion of serum from this horse's blood injected into the body of a child would be sufficient to protect the child against the diphtheria poison; and that is the philosophy of antitoxin; that is the reason why antitoxin has saved so many lives of children. See what a marvelous thing that is, my friends. A small dose of poison is introduced into the horse, and the horse is made just a little sick, but not very sick, and in a few days, a little while afterwards, another dose is introduced, and after while the body is trained so the antidoting substance can be introduced in enormous quantities. Then a little of the serum from that blood is injected into the body of the person that has diphtheria and it

will save the life of that patient. That is what the human body is trying to make, but it is not able to make quite enough, perhaps, to save the life; so we borrow some from the horse, and in that way the life may be saved.

I think this is one of the most wonderful illustrations of the intelligent Power working in the body in the case of an emergency. So we see, I think so clearly that no scientific man will undertake to deny it,--we see there is abundant evidence that there is within the body an intelligent force, an intelligent power continually at work. This idea does not seem to be altogether a new one; it has always been possessed by somebody some people or other away back in the ages. David, you know, said, "He wakeneth me morning by morning." David knew he could go to sleep, but he didn't know how he could wake up; he didn't know how it was he waked up; and I don't know any physiologist that can explain this waking up. It is a very remarkable thing. Waking up is a great deal more remarkable than going to sleep. It seems to me it is easy to go to sleep; we can not keep awake; we are tired and exhausted, by the toxins that accumulate in our bodies; so we become tired and go to sleep; but how about waking up when we once get asleep? Why don't we stay asleep? Sometimes a person does go to sleep and never wakes up. We can not voluntarily wake ourselves up from sleep; but David said, "He wakeneth me morning by morning." An infinite Power is caring for us, looking after our interests all the while, and that is the Power that heals, so that all healing is divine healing. We hear people talk sometimes about divine healing. We hear some people discussing about divine healing. I am a thorough believer in divine healing, because I believe in divine creating. I remember very well a lady came into my office some years ago whose life had not been very successful, and she was 37 years old, and very unhappy and miserable, an invalid, broken down; all her life plans had been frustrated, and she was very unhappy indeed, and she said to me one day, "Doctor, do you really

believe there is a God that takes an interest in us?" I said, "Why yes; I know not only believe it, I know it, am sure of it." "Oh, if I could only believe that, I would be happy; but I can not believe it. God is so busy looking after all the great affairs of the universe, I can not believe he has any time to look after me." "Now," I said, "I can prove it to you." "Well, I wish you would." I said, "Now, put out your hand here, I want to feel your pulse." And I put my finger upon her pulse, and I said "Your heart is beating." "Why, yes, my heart is beating; of course my heart is beating. I don't feel it, of course." "The heart doesn't beat unless it is told to beat. Your arm is not going. If I ask you to strike the table here, you can do it or not as you choose. Now, just suppose you make your heart go a little faster. It is beating 75 times a minute; make it beat 100 times a minute." "Oh, I can't make it beat." "Well, make it go slower then." "Oh, I can't make it go slower either. I can't change the beating of my heart by thinking about it." "But your heart is a muscle; you can control your hand. You can beat fast or slow with your hand. Your heart is a muscle like the muscles of the arm, that move when you beat with your hand or your fist. Why can't you control your heart? It is a muscle, and every time the heart contracts it has to have an order; it has to have instruction; it has to have an impulse; it has to have a direction given it to beat, and how hard to beat, and how much to beat; so there is a muscle, and in the case of your arm your will is behind that muscle; your will sends an order out to the muscle, and the muscle acts. The same thing is true of the heart; there must be an order, a will behind it. So you see there is an intelligence in the body that is making your heartbeat because you have nothing to do with it. There is a will there which is controlling your heart. You can not control it. It has to be controlled. If it was not, it would be running away and very soon would stop. It has to have directions given to it, and you can not give it any directions. There is some other power that is controlling

it." Well, she thought about it. A couple of weeks afterwards I saw her, and her countenance was entirely changed. The old, unhappy look had disappeared. She wanted to see me in the office a moment, came in and sat down, and said, "Doctor, I want to tell you I am the happiest woman that lives. I went up after talking with you the other night, and I got down before the open window, as the ~~sun~~ sun was setting in the western sky, and I said, "O God, help me to believe that there is a God that cares for me", and she said, "it just came over me that minute that that was really emphatically true, and I have been happy ever since." This woman was an invalid. I am glad to tell you that in a few weeks she was well, and the ambition of her life was satisfied. She is today living in a beautiful home with a noble man for a husband, and a lovely family of little ones about her, and she is as happy as she can be. She has found that the power that made her was looking after her all the time, and she thought she had been forgotten; but she found she was being led along in just the road she needed to travel; and I said to her, "It may be one of the providential things in your life, and one of the evidences of providential care--the fact that you are right here." And it will turn out so and is already.

Now, I think that is one of the most important things for sick people to get into their minds,--the fact that healing is a divine process, that it is a corrective process. It takes exactly the same power to heal a man that it did to cure him. What are we going to do about it then? There is only one thing we can do, and that is to get ourselves in harmony, to get in line. That is the only thing we can do. Somebody suggested that the greatest thing anybody needs to do is to get in harmony with the universe, to get in tune with the universe. When one thinks of the great universe, he can not think otherwise than of harmony, because you see how these great planets circle around the suns, and the suns are all circling around other great centers somewhere, and there is a great harmony. The great astronomical clock keeps time; it does not lose time.

We see the procession going on, and in all the processes of Nature there is evidence of marvelous harmony; it is all regulated and controlled. This Power behind it all is working for us, it is working in us, and it does not forget us. When a man is sick, the Power that made him is interested in him, right there with him, working for him, doing the best it can to cure him; and if there is any man that is not cured, it is only because the conditions are such that he can not be consistently cured. This Power works in harmony with the great law of consistency; it must do that; it can not do otherwise. We must never think of God as an unlimited being; God is limited. He is limited by his perfection. God can not do everything. God can not lie. God can not do any unreasonable or inconsistent thing. Being perfection, all his acts must be absolutely consistent, they must be harmonious; so it is impossible for God to do certain things. For instance, here is a man that has got tobacco heart. God can not cure him of tobacco heart as long as he keeps on smoking. He absolutely can not do it, positively can not. The man that has tobacco heart has been using tobacco until his heart has got sick, got diseased, because of the poisonous effect of nicotin upon it, and all the time God has been doing for him everything he possibly could do under the circumstances. If he had not, then man would have died. The first time a man ever smoked he would have died on the spot if it had not been that the Power that made him sustained him and enabled him to combat that poison; so he has been healed as far as he could be healed all the while. This healing process that has been going on within us all has protected him from death, has saved him from immediate destruction. It has not healed him entirely because he has kept on using his tobacco. Now, he must stop the use of tobacco. If he ceases to use tobacco, then he will get well, get well so far as it is possible for him to get well. He may be irreparably damaged. The old prophet said, "Cease to do evil, and learn to do well", and that is the whole thing after all. As I said, it is to get in tune, to get in harmony.

Now, my friends, there is great hope in that thing--that the Power that made us is the Power that heals us, and the Power that made us and has been interested in us all our lives, sustained us, cared for us, directed us, led us in a thousand ways. We have never appreciated at all that that power is working for us, is just going to do the very best that can be done for us, and the thing that we can do is to get in harmony and co-operate. How earnestly, then, we ought to study everything that pertains to our physical welfare; how earnestly we ought to be willing to co-operate, how willing we ought to be to co-operate in every way in our power so that this healing process that is working in us may be perfected, may be carried forward without hindrance.

I know some people believe God doesn't do anything for anybody unless he is teased to do it, unless he is somehow persuaded to do it, somehow bribed to do it. No, the Power that made us is not that sort of being, my friends. It is too great, too benevolent for that. The power that made us and has taken the pains to cure us is interested in us on our own account--not on his account, but on our account. A mother sees her little boy fall into a mud puddle in the street and she goes out and rescues him, brings him in, washes him up, puts on a clean suit of clothes. Why? Not for her benefit because she wants a clean boy; for his benefit. It is her boy, and she wants that boy to be a clean boy and a sweet boy. She is interested in him. Now, my friends, can you imagine that the power that made us, that created us, should have less interest in us than a mother has in her boy? could be less solicitous for our welfare than a mother is for her child? The Bible says, you know, "Like as a father pitieth his children, so the Lord pitieth those that fear him." I believe that is a great principle and a great truth.

A man was in my office some time ago who told me how terribly he suffered. In fact, I met him outside and took him in, he looked so bad; he could not sleep, he said, and he was afraid he was going to take his life; he was in a dreadful

state of mind, and I saw at once it was a case that needed help right away quick, and I didn't know whether I knew anything--I didn't think I did know anything I could do for him quick enough to help him, because that awful thought was crowding upon him that he must take his life; and he was afraid he was going to do it. He was in a most terrible state of mental anguish and agony, and could not sleep. I said to him, "I know of a man that was in just your state once, and he got out of it." "Do you, Doctor? How did he get out of it?" "Well," I said, "I will tell you." I opened the Bible, the Good Book here, and I read in one of the Psalms here, the sixth Psalm and the 6th verse: "I am weary with my groaning. All the night make I my bed to swim. I water my couch with my tears." "Well," he said, "Doctor, that is me. Why," he said, "I just lie awake there and weep and weep and weep, hour after hour; that's just me. How in the world did he get out of it?" So I read another verse. "The Lord hath heard my supplication; the Lord will receive my prayer." See what happened to him. "Thou hast put gladness into my heart." "Thou hast put gladness into my heart",--there wasn't any there before. "I will both lay me down in peace and sleep." Well, that is just what happened to him. He laid down in peace and slept. So we got down on our knees, and I prayed, and he prayed in my office. I met him half an hour afterwards out in the lobby as I was going through; I saw him and he came hurrying to me across the lobby, got hold of my hand,--"Why, Doctor," he said, "I am just the happiest man that ever was. That awful feeling is all gone, and I just feel like another man." Now, there was something put into him that was not there before; and that is the advantage of the knowledge that God is a great beneficent Father; that there is a great healing Power that is abroad in the universe that is working for us, working for us when we do not ask it to work, that does not have to be teased or persuaded to do things for us, but is working for us, doing everything it can do all the time. And now then, all that we can do is to get in harmony, get in tune, get in line; and that we can do if we will.

We can turn away from our evil ways and wrong ways, and surrender ourselves to the great Power that made us; and that ought not to be a very serious thing for anybody to consider,--surrender ourselves to a power that made us, the great Creator of all the universe. It ought not to be a very hard thing to surrender to a Power so great as that. Certainly there is nothing humiliating about it if we recognize the fact that God is our friend and our father and our healer; then we can co-operate, and we can expect great things may be done for us, that would not be done and could not be done when we were in rebellion and fighting against this Power, and not co-operating, but ~~standing~~ combating it instead. But I must not tax you any longer. I thank you for coming in this evening; and I hope each one of you will try to lay hold of this great healing Power and to co-operate with it.

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HOW TO LIVE LONG AND WELL.

A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Mich., Thursday,
May 25, 1911, at 8 P.M.

By,

J. H. Kellogg, M.D.



I am going to talk to you a little while tonight about how to live long and well, how to attain to a great age. When I was in Vienna a few years ago, I visited the famous Prof. Winternitz, who is professor of hydrotherapy at the royal medical school at Vienna. I am very well acquainted with Prof. Winternitz, and while I was there, the Professor and Mrs. Winternitz made a little dinner party to which I was invited. During the course of the dinner, it was noticed that I did not eat any meat, and one of the ladies said to me, "Doctor, I think you are the most original man I ever met." That was a very polite way of saying that she thought I was a crank. I said, "Is that so? Why, this idea of living on a non-meat diet did not originate with me; if it had, I should have very little confidence in it. It is because it is old, and because it is the original diet of man that I have confidence in it." She said, "Doctor, do you think one could live to be very old on such a diet?" I said, "Why, certainly; I had a relative who lived on this diet and lived to a very great age." "Is that so? How old did he live to be?" "Well, I am afraid to tell you, for fear you would not believe me." "Oh, yes, we would believe you." "Well, he lived to be nearly a thousand years old." "O-o-o-h!" They were all disappointed. A man at the table said, "Just tell us his name." I said, "His name was Adam." "Oh!" Now, my friends, we seem to be quite content if we can live to be sixty or seventy years old. But we frequently find people sixty or seventy years old who are quite vigorous. We had a visit here some time ago from a gentleman who

was one of the finest gentlemen I ever met in my life, Dr. Stephen Smith, of New York, who was then over eighty years old; and I received a short time ago an invitation to attend the celebration of a banquet on the celebration of his 87th birthday. It was given to him by the leading physicians of New York. He made a very interesting and a very appropriate address on this occasion. Eighty-seven years young, this fine old gentleman is--hair as white as snow, his skin as clear as a boy's. He hasn't got great brown circles around his eyes and great big freckles on his hands; he hasn't got hard arteries. The arteries are still soft. I believe he will still be young at ~~sixty years of age~~ a hundred years of age.

It is astonishing how content we are, how satisfied and willing we are to be killed off when we are fifty or sixty years old by some miserable disease by germs of some sort. Why, my friends, we ought to be ashamed to be old when we are still young in years,--old in body, worn out, decayed in body, the body tumbling into ruins when we are only fifty or sixty years old--we ought to be still in our youth, just in our prime. Now, the trouble is we do not live right. We have departed far away from the normal conditions of life. Our hearts wear out. Now, a man is very likely to live so long as his heart is still young, and so long as his kidneys are young, and the liver is young--he can get along with a very miserable kind of a stomach if he only has a young heart and young kidneys and a young liver. We have such a great excess of lung capacity that we can get along with a very small amount of lungs. We use ordinarily less than one tenth part of our lung capacity in our ordinary breathing; so if we are not going to run and exercise in a violent way, we can get along with very small lung capacity; but we can get along with small liver capacity because it is the duty of the liver to keep the blood clean. That is the thing of greatest importance, the most essential thing for life,--is clean blood, because it is the blood that creates; it is the blood that maintains our life; it is the blood that heals. And if the blood becomes unclean, then the whole body rapidly falls into decay.

That is the trouble with almost every one of us here--the blood has become unclean. It is an old saying, when you have a wound on your hand or any part of your body, a skin wound that does not heal readily, that is said to be a sign of impure blood; and it is.

Now, here is the heart. As I was just saying, we are young so long as the heart is young. These arteries you see supply blood to the heart so long as they remain young; so that the blood can nourish the heart, the blood can be supplied, the heart can be supplied with blood and then it continues to do its work. You see the heart is a muscle, and it ~~ix~~ has a lot ~~max~~ of work to do; it has the biggest job of any in the body. That little muscle there, only the size of your fist, lifts 124 tons every day--just think of that, my friends. That little muscle has to do 124 foot tons of work a day. "Why," you say, "a little muscle like that could not do it." Now, this is the way it has to do it. Here is a big bushel basket full of marbles. There are probably some people here who could live that bushel basket full of marbles, but a small boy could not lift it; and yet a baby can lift that whole bushel full of marbles by lifting one marble at a time--just one marble at a time; so the heart, doing its work one beat at a time, sixty beats a minute, it lifts so many ounces at each beat; and you take all those little lifts and put them together and it mak~~es~~ 124 foot tons; and that is a lot. That is 248,000 pounds, or a quarter of a million pounds that little muscle has to lift every day.

Now, it makes a wonderful difference whether that little muscle is supplied with clean blood or with dirty blood; it makes a wonderful difference whether ~~of~~ not it is saturated with alcohol, or tobacco, with tea or coffee, or caffeine, and the poisons of mustard, pepper, peppersauce, ginger, and things of that sort that produce all the putrefaction that is going on in the colon; it makes a wonderful difference whether the blood goes coursing down through these veins to support that ~~life~~ living pump; it makes a wonderful difference what kind of blood it is. It is the duty of the liver to keep the blood clean.

by keeping poisons out of it, filtering poisons out. It is the duty of the kidneys to keep the blood clean by separating poisons from the blood, straining or filtering the blood and carrying off the poisons. Examinations made, post-mortem examinations have shown that ~~xxxxxxx~~ of all people sixty years of age, 73% have degenerated arteries. That is, the arteries have undergone degeneration in 73% of the ~~xxxxx~~ people who die at the age of fifty to sixty years. That is a very large percent. Three fourths of all the people who die between the ages of fifty and sixty years have old hearts. That is the primary reason why they die. You have perhaps noticed that most of the people who die of pneumonia are babies or old people; they are old folks or babies, the victims of pneumonia are. The babies die because they are so young their hearts are weak yet, are not yet strong. An infant that is carried around in arms is a very sedentary person, and has not taken exercise enough to get a strong heart yet; so the heart is very feeble, very weak. An old man who has become too feeble for exercise, sits around in his chair by the fireside--his heart is weak from lack of exercise or from senility; and if he gets pneumonia, he is pretty certain to die, because his heart has not the power to ~~xxxxxxx~~ carry him through that terrible disease, to withstand the paralyzing effect of the poisons which are circulating in the blood when a person has pneumonia. We must think a little more about our hearts, and take a little better care of our hearts. If we sit down and do not exercise, the heart gets weak just as any other muscle of the body gets weak. Did you ever stop to think of that? Suppose you have been lying in bed a week; you get so weak you can hardly walk. And your heart gets weak in just the same proportion as your legs. Because when one is lying in bed, the heart has only to move the blood in a horizontal plane, but when one is standing up, or sitting up, and going about, working, the heart has to lift the blood up into the head; it has to pump it up ~~xxxx~~ out of the feet; it has to circulate the blood in the body in a vertical plane; it has an immensely greater amount of work to do. We

must take better care of our hearts if we want to live to be old. That is one thing of vital importance. The majority of people who die die of heart failure. This is so universally true that it is not permitted nowadays that a doctor shall put down as a cause of death heart failure, because that is what everybody dies of. If the doctor puts down on the death certificate heart failure, the authorities come back to him to know what that means; what else did the patient die of? Because if the heart were only able to keep on with its work, the majority of people who die would not die at the particular time they do die at any rate. So with the lungs. People who have consumption do not die, really, because they haven't enough lung capacity ~~farxxix~~ to keep them alive. They die of some other trouble. Other parts become weak along with the lungs. The kidneys and liver have failed, and that is the real cause why they die. Ninety-six per cent of all people who die of tuberculosis of the lungs, have degenerated livers, liver disease. Eighty-six per cent of them have degenerated kidneys, and those ~~as~~ the things that really kill them rather than the loss of lung capacity.

Now, ~~te~~ blood which this heart circulates is the most wonderful tissue of the body; it is really a living tissue, a fluid tissue, a sort of circulating market, it is called, because it carries around foodstuffs to the tissues, and takes back from them waste materials, the waste substances that have been used. These cells which you see here, the red cells, carry in the oxygen which feeds the tissues, and the clear portion of the blood, the plasma of the blood, carries in the dissolved materials which are to be made into tissue, the liquefied foodstuffs; but besides that, there is another class of cells that are known as white cells; they are colored here in this picture, but they are white when you look at them through a microscope; they really are transparent, ~~axaxkxaxzalaxing~~ free from coloring matter, as a matter of fact, haven't any color at all, but are transparent like water; and as you look at them through a microscope, you can look right through them; but when saline substances have been applied, they

acquire the appearance you see here. and by means of various stains that are used it is possible to distinguish a number of different kinds of these living white cells. These cells are very numerous in the blood. About seven thousand of them are found in a minute drop of blood not so large as the head of the smallest pin; a drop not so large as the head of the smallest pin contains seven thousand of these living cells, every one of them a perfect, living creature that can feel, that can smell that can taste, that can digest, that can move about, and yet it hasn't any legs, it hasn't any brain, it hasn't any nose, hasn't any tongue, hasn't any mouth, hasn't any stomach,--just a little drop of living jelly, but it ~~xxxxxxx~~ is the ultimate living substance, protoplasm, and it has all these properties in one without being differentiated; every particle is able to digest; every particle is able to feel, and able to smell, and able to taste, apparently, and is able to move about by volition. It certainly is a wonderful thing, this little living cell.

Now, some of these have for their business to go around through the body--these large ones here have for their business to go about through the body and gather up rubbish, the material that is not useful any longer, that has outlived its usefulness, is worn out, a waste matter, and is in the way. It is the duty of these cells, these large cells, to pick up those little particles and carry them off in a sort of garbage box, the spleen, in which these things are deposited, or in the liver, so they are finally dumped out of the body. Some of them are carried out through the surface and so are carried away and thrown off from the body. These smaller ones have for their duty to capture germs that get into the body. Now, germs are the very greatest of all the enemies of ~~xxxxxx~~ human life. They get into the body, and they grow and multiply and clog up the blood vessels, and the tissues, and the worst of them manufacture poisons which attack the body in a variety of ways and destroy the body, set up degenerations, paralyze the nerve centers, and produce a great variety of unpleasant

symptoms; so these white cells are wonderfully useful. They are the defenders of the body and the scavengers of the body. Some of them are scavengers and some of them are defenders. They are sanitary police, if you please, a sort of military police. Some of them may be sort of sheriffs that are sent out to arrest our enemies, invaders of the body; and others are scavengers that go about collecting up the waste material.

This shows some of those same large white cells. Here is one of the little germ catchers. These small cells capture the germs, and these big ones are scavengers that gather up rubbish and destroy it. This is not a fairy tale I am telling you, or an imaginary story; it is what we know to be true, what we can see, for we can see these creatures at work. Sometimes perhaps you have had a sprain in your finger or in some other joint. After while it would swell up and by and by the swelling would disappear. How did it go away? These large cells swarm out from the blood and gnaw away that swelling and carry it off bit by bit, digest it and carry it away so it is dissolved out. These are some of these same white cells that have become diseased. You see how different they look from the picture we had a moment ago. This is leukemia. In pernicious anemia the appearance is very similar. These white cells become degenerate, they lose their power to do the work which they ought to do, and they multiply in great numbers in the blood and attack the body itself instead of attacking the rubbish,--attack the body itself and destroy it, do it damage. When the body itself becomes deteriorated, they sometimes invade the muscles. Here is a normal muscle fiber, and here are some of these cells which naturally lie between the muscles, and they have gotten into the muscles here and are eating up and destroying them. That is what happens to a man who has fatty degeneration from the use of alcohol. That is what happened to Jeffries, why he got beaten, because he had been keeping a saloon for several years, been drinking beer, and he was not aware of the fact that he had lost the great power he once had; and

he was not able to develop those muscles by exercise to the gigantic strength he once had; so when he came to the final combat, he found he was lacking; his muscles had been stolen away from his body while he had been drinking his beer; his muscles had undergone degeneration. That is the reason why, as the pugilists say, a man fails to come back; he has lost the power to recuperate. They don't know why, exactly, but they say he hasn't the power to come back; he has lost that power. He had lost it because he had undergone this degeneration, and these white cells had made it. We have a very good illustration of what these cells do to us when the hair becomes gray. The hair is a tube that has liquid in it, and in this liquid inside of the hair, there are little pigment cells, little brownish colored granules; and this shows a picture here of hair of that sort, and these are the little granules in the hair, and here is one of those pigment cells, those great white cells we were talking about we see here, and this one looks like a great Octopus or devilfish, climbing up inside the hair here and stealing away the coloring matter. You see it has gathered in a great number of them, and when it gathers up a great number of these pigment cells, it goes away and leaves the hair, and carries the coloring matter off with it, and that is the way the hair becomes white, because it has been robbed of its coloring matter. Now, in the same way they attack our brains and attack and rob our nerves. They rob our kidneys, and steal away the kidney substance, carry it off. Here they are attacking the kidney, and here you see them at work. That is what Bright's disease is--it is the man's kidneys being robbed by the white cells of his body which naturally are scavengers, but they have seized upon the body itself and are destroying it, because of the diseased condition into which the body has come through wrong habits of life. Here they are attacking the nerves and carrying away the nerve tissue. That is the way people get locomotor ataxia; that is the way they get paralysis. They sometimes attack the blood vessels, and here they are attacking a brain cell. That is the way we lose our

memories; that is the way we get stupid in old age, that is the way we get apoplexy, because these cells attack the blood vessels of the brain.

Now, these cells are induced to do this destructive work by the taking of poisons into our blood, the poisons I was talking to you about which destroy and paralyze the heart. These same poisons, when taken into the blood, destroy the blood vessels, destroy the brain through setting up wrong action of these white cells. These poisons are, for the most part, products of germs. Some of them we take in from the outside like alcohol, that is a product of germs too; but tobacco which is not a product of germs, tea and coffee--those are other poisons that we take in along with our food generally, and there are various other poisons we might inhale. There is opium, and strychnia and other drugs including morphia, that have a similar effect; but the worst of all poisons are poisons that are generated in our bodies, poisons that are formed in the colon, poisons produced by the putrefaction of undigested remnants of foodstuffs. We are coming to appreciate that more and more. For thirty-five, or nearly forty years now, the world has been learning about ptomaines and leukomains, and other poisons that are generated within the body, but only within the last few years have we come to appreciate the real importance of these poisonous substances, and the terrible havoc which they work in the body, when their action is unrestrained.

Here are some of these germs, these little red masses you see here, which represent the germs which produce these deadly poisons in the colon. They are sometimes found growing in the mouth, on a coated tongue; the tongue becomes coated, and the breath is bad; and these same germs are growing all the way down through the whole thirty feet of intestine. They flourish in the lower part of the small intestine and the colon, and the colon is dilated and diseased, and then these germs grow with great rapidity, and in enormous number, so ~~many~~ many as 200 or 300 trillions of them may be produced in a single day. Just think of that number--beyond all conception. Two or three hundred millions of millions

are produced in a single day. Now these other germs you see here, these other masses, the long bluish masses, are the friendly germs. These are germs that are also growing in the intestine, but in smaller numbers here, and the proportion of the red ones to the blue ones, and the proportion of friendly and unfriendly ones, the poison makers, and the acid formers,--the proportion depends upon the diet. Now, you know if you go out into the country you may see a certain soil here, perhaps a black muck soil, and you find certain species of plants growing, and you get out into another part of the country, and find some sandy hills, and you will find an entirely different class of plants growing up on the top of those sandy hills from those you find down in the marshes on the muck lands, and the low lands where there is plenty of water. Now, it is exactly so in the interior of the body. These germs begin to grow right away after we are born, in the body. Within six hours in summer time, and twenty hours in winter time, the whole interior of the alimentary canal becomes luxuriantly covered with bacteria. They are growing in great numbers everywhere. Now, these bacteria are called the flora, the flowers, if you please, the flora, the vegetation of the intestine and the alimentary canal. Now, those that are formed at birth, that first occupy the body here, are friendly germs that produce acids, and in producing acids they protect the body against the encroachment of unfriendly germs which produce poisons, which can not produce acids and which can not grow in the presence of acids; they can ~~grow~~ not grow where the acid-forming germs are present, because they produce alkalis, and an acid condition is unfavorable to their growth; and that is the reason why the frontier housekeeper puts her fresh beef into sour milk to keep it. The fresh meat is full of putrefactive bacteria that can not grow in the presence of acids; so the fresh meat is put into some sour milk, and will keep there for some little time. By changing the sour milk once every two or three days, the ~~meat~~ meat can be kept fresh a long time. Next month we will have a celebration, and you can all have a

chance to participate. We have down in the cooking school here a beefsteak. It is the only beefsteak we have in the house, and the only beefsteak we have had for several years, but that beefsteak was put into a glass jar with some yogurt buttermilk three years ago the seventh day of next June, three years ago next month it was put in there, and it is perfectly sweet now, in better condition than when it was put in there. It is in a perfect state of preservation, and it will keep, I suppose, indefinitely, so long as the buttermilk is changed two or three times a week it retains the acid, and the beefsteak undergoes no change so long as it is in this acid condition. That is because of these Bulgarian bacilli that are growing there, and they produce acid, and the acid prevents the decay of the meat. Now, the very same thing is true of our own interiors. If we keep them in a buttermilk condition, if you please, or keep them in a slightly acid condition, then the putrefactive bacteria which produce auto-intoxication, which cause headaches and migraine, and sick headache, and biliousness and skin diseases, and arteriosclerosis and a great variety of chronic ailments--these germs will not grow, and they can not produce their poisons. That is the reason why a vegetable diet is so much more favorable and healthful than than a meat diet, because meat favors the growth of unfriendly germs. It not only favors their growth by furnishing material upon which they live and thrive, but it actually introduces the germs themselves, for they are always found in meat in great numbers. A bit of meat as big as the end of your thumb may contain as many as twenty billions of these unfriendly germs ready to produce their poisons and growing in the body just as soon as they are swallowed. ~~That~~ Some of the meat, of course, is digested and assimilated, but a part of it remains undigested, and those parts undergo putrefactive changes in the colon and so make the trouble. So if we are suffering from auto-intoxication, you see at once the importance of discarding meat with its putrefactive materials and introducing into the intestine only those foodstuffs that encourage the growth of the friendly germs. Cereals

of all kinds, everything that contains starch in abundance, or sweets, the sugars of fruits and fruit juices, sweet juices of all kinds, and vegetable products of all sorts with these farinaceous and saccharin materials encourage the growth of friendly germs, and consequently are the natural diet of man, for man's alimentary canal is not adapted to dealing with a great number of putrefactive poisons.

There is a very intelligent face. I presume most of you will recognize it--the face of Thomas A. Edison. Michigan feels very proud of him, because he was a Michigan man. He was born in Saginaw, not far from here, and was formerly a newsboy on the Grand Trunk Railroad that ~~runs~~ runs through this town. He showed himself to be a genius before very long, and was doing things without very much assistance. He educated himself, worked himself up to the position he now holds as the master inventor of the world, probably the greatest genius in invention that there has ever lived; and he has thought it worth while to give some attention to the question of diet. His wife was with us last summer. His sister-in-law was with us several months, and his wife made us a visit while she was here, and she was a very charming lady, in perfect health, and she told me a great deal about Mr. Edison's habits. I knew him many years ago, but have not had the pleasure of meeting him now for a good many years, but I was glad to know that he discards tobacco, and discards alcohol, and absolutely won't have anybody about him that smokes or drinks. At one time he found outside of his door a cigaret case, and he put this notice up--that the fool who owned the cigaret case could have it any time by calling for it. He has given careful attention to the question of diet, he takes pains to chew his food, eats very sparingly, eats twice a day, takes the greatest care in the selection of his food, and ~~manx~~ takes those things that are wholesome for him. Mr. Edison thinks it worth while to take care of his corpomobile, as Mr. Fletcher calls the body; he thinks it worth while to give his bdy just as good care as he would give his automobile, or phonograph, or any of the various delicate machines which

he has invented. Now, a man of Mr. Edison's genius and intelligence would not give attention to a matter of that sort unless he thought it worth while. And he finds it worth while; he finds increased efficiency in his bodily machine when he gives it the kind of care which he is taking of himself. Here is another face which will interest you.

This is the face of Cornaro, a man who at forty found himself broken down completely in health, a perfect wreck from high living and dissipation, and he changed completely his habits of life and lived to be over one hundred years old, in perfect health, and on the most abstemious fare, taking just some very simple food. He looks rather spare, but you see he has a very kindly and intelligent face. He was an architect and an artist, and a man of letters. He became a very wealthy man, and a man of very great influence, a promotor of art and of the public welfare.

Here is another strong face that you will recognize, the face of Tolstoi, who during the last thirty or forty years of his life--in his early life was a high liver, given more or less to selfish indulgences, but during the last twenty or thirty years of his life was a ~~strong~~ strict abstainer from intemperance of every sort. He was a flesh abstainer and never tasted flesh under any circumstances. The newspaper story got out that Mr. Tolstoi had given up vegetarianism. I know some of his friends advised it because he had diseased kidneys, had malarial infection from mosquito bites, and his kidneys were affected, and the doctor said he must eat meat. His son, Leo Tolstoi, wrote me about it; but he didn't. He strictly abstained from flesh eating, and I have a letter from his daughter written to me by his request a year or two before he died, in which he said he abstained strictly from flesh, never tasted flesh under any circumstances, and denounced the use of flesh as entirely unnatural and unwholesome. He prolonged his life many years by his abstemiousness, taking care to provide his body with the sort of nourishment that was best for it.

There is another genius, Leonardo da Vinci. You know who he was, next to Michael Angelo, perhaps, one of the greatest artists that has ever lived, certainly one of the greatest that has lived in the more modern times. He lived from 1452 to 1509, and he was a strict abstainer from flesh, abhorred flesh eating, and was a man of great temperance, and great sobriety. He gave great attention to the care of his physical health, and this has doubtless accounted to a large degree for his wonderful success in life in every particular, and for his marvelous excellence as an artist.

Now, look, on the other hand, and see what our flesh indulgence demands. In every large city there is an abattoir where the most horrible scenes are enacted. Just think of it--the evisceration of animals, the cutting open their bodies, tearing out of their entrails, shedding of their blood, and the cutting of their throats, of the groans and the screams and the shrieks of these poor brutes; and these men smeared with blood, grinning like demons as they see the blood spurting from the throats of their victims--it is too horrible a thing to describe, to be thought about; yet we compel the existence of these dreadful things in order that we may feast upon flesh that is absolutely unnecessary, that inflames our own blood, and that deteriorates and degenerates and destroys our own bodies. These cattle have been decoyed into these pens where there is no possibility of escape, where they have no chance for their lives; and here comes a man from behind where he is not seen, and strikes the animal in the forehead, stuns it; then his door falls down, and while the animal is stunned, is still quivering, its skin is taken off, its entrails are taken out, and the animal is sent on to be quartered, and finally sent on to the tables of men and women--Christian men and women.

Such a thing could not exist in India among the higher classes there, among the Brahmins. A brahmin would just ~~xx~~ as soon think of cutting his throat as of eating the flesh of an animal. If there were six Englishmen set afloat

at sea in a boat and they should be picked up ~~smax~~ six weeks afterward, if there was one of them found left, all the rest of them would probably exist only in him as a representatis of them all. But if there were six Hindus, six Brahmins cast to sea in a boat, when they should be found, if they should be found at anyx time afterward, there would be six skeletons there instead of one man representing the whole number.

Now, in the eating of flesh see what we expose ourselves to,--trichina in pork. Two per cent of all hogs have trichinae. Mr. Grubb, of Colorado, the great potato raiser, the man who raises, I suppose, more potatoes than any other man in the United States and is supposed to raise the best potatoes too that are raised in the United States, so good that he gets ninety cents a bushel no matter what the market is,--he raises 400 bushels to the acre, and he is a member of the State Board of Agriculture of Colorado, and is just back from a two years' trip all through Europe where he has been sent by the United States Government to study potatoes. He came up here the other day from Chicago on purpose to find out how the Battle Creek Sanitarium cooked potatoes, and to find out whether I recommended potatoes, and what for, and I had a very interesting chat with him. Now, he is, as I said, a member of the State Board of Agriculture of Colorado, and he told me that in one section of Colorado forty per cent of all the hogs are infected with tuberculosis ; forty per cent of them all have tuberculosis. How do they get it? They get it from eating the skimmilk from the cows. The milk is sold to the dairies there, the cream is used in te dairies for the making of butter, and the skim milk is taken back and fed to the pigs, and there are so many tuberculous cows there that forty per cent of the pigs have tuberculouiss. He also told me that up in Wisconsin you can trace the dairy routes through the country by the tuberculous pigs. All over the State of Wisconsin where there are dairies, where there are butter factories, where they are making butter, the milk is skimmed, and the skimmilk taken back and fed to the pigs, and the pigs

are everywhere infected with tuberculosis. He told me that in Scotland he found more than 50% of the cows have tuberculosis--cows that are slaughtered. In Germany over 50% of the cows that are killed and sold in the market have tuberculosis. In some parts of this country the same thing is true. Probably, taking the United States as a whole, probably about one fourth of all the cows have tuberculosis sooner or later when they are killed. So we see this disease is becoming very, very widespread, and largely, without doubt, through the use of milk and of flesh of tuberculous animals.

Down in the state of New York they have been fighting tuberculosis for a good many years now, and I saw an official statement a day or two ago to the effect that there has been absolutely no progress whatever made in fighting tuberculosis during the last five years. In the State of New York tuberculosis kills just as many people today as it did five years ago--just as large a proportion of people; there has been practically no progress made. The same thing is true in this state and in other states. Considerable progress was made at first, but very little progress is being made at the present time, and there isn't likely to be any very great additional progress made unless we get ~~ant~~ at the root of the matter, unless we cut off the great causes of this disease which are the use of tuberculous milk and the tuberculous flesh of animals, and in the lowered vital resistance from our indoor life, and neglect to live outdoors in a natural way.

Here are measles in flesh that produce tapeworm, and there is a full grown tapeworm. Each one of these little specks has got a young tapeworm inside, and when that cell is broken by the gastric juice, the little tapeworm attaches itself to the lining membrane of the intestine, and grows and develops and after while we have got a full grown tapeworm. A tapeworm is a whole community. The first member of the community, the first man hangs on, and all the rest of the members of the community hang on to the one ahead of them. It is a community

in a procession. Each one of these little creatures is a separate individual, and each one just clings fast to the one ahead of it, and has another one clinging fast to it behind. It is not only a separate individual, but two individuals, for these are bi-sexual creatures, and every one of those little joints is both male and female, and produces thousands of eggs. These eggs find their way into the sewers and are carried into the rivers, and cattle drink the water and get the eggs, and in that way become infected, and oxen becoming more and more infected. We get trichinae from pigs, and get tapeworms from oxen, from beef, so we are sowing seeds of tapeworm everywhere, in every stream all about the country, and we are reaping the harvest in ourselves.

Go down to the market and you will see a piece of meat that looks very red, and that means the animal had fever when it was killed. You see some pale meat, and that means consumption. You see some yellowish meat, and that means jaundice; the animal had jaundice. These creatures are very subject to jaundice. They have gallstones also.

Because of our use of meat we are suffering from lime starvation. Did you ever stop to think of that? As I was telling you the other day, when we eat the pig we do not get all the corn that the pig ate. The pig eats the corn and gets the lime, but the lime goes into his bones; and we fail to eat the bones, so we do not get all the lime, and because of that we are suffering from lime starvation. As you see here, a pound of eggs has four grains of lime; one egg has half a grain; a pound of cow's milk has fourteen grains; a pound of wheat four grains. We need thirteen grains of lime every day of our lives, because we lose thirteen grains of lime; if we live largely on meat we get no lime. If we eat four pounds of meat a day, we get only two grains of lime. So we can not get it from meat, but must get it from peas and wheat. Fine flour bread contains no lime. Personally I never eat fine flour bread, I discard it entirely for it contains no lime; and it is lacking in other necessary elements. The graham

flour contains all the lime that we need,--four grains to the pound. And if we eat graham flour, peas, beans and things of that sort, we shall get the proper amount of lime; but if we live upon a meat diet, we can not possibly get it. The American people are suffering from lime starvation, because two thirds of the American diet is made up of meat and cane sugar and so is lacking in lime. The natural diet is designated, indicated to us by Mother Nature just as clearly as the diet of the horse is indicated to him. Now, the horse eats the diet that belongs to it. You never see a horse trying to eat food that belongs to some other class of animal. A horse has horse sense, so he seeks his proper bill of fare. The average man has lost his horse sense, and so he eats not only the food that belongs to him, but he hunts up everything, goes around the world to find what other animals are eating, and he eats everything every other animal eats. I don't know of any other animal that eats what man doesn't eat. He prides himself that he is omnivorous, which is not at all true. He is frugivorous. Now, look here at his ~~teeth~~ teeth. There are thirty-two teeth, sixteen in each jaw, three molars behind, three big molars, then two small molars; then one bicuspid tooth then one single cuspid tooth, then four incisors,--four on each side. Now, that is what we have in the jaw of the gorilla--three large molars, two small molars, two canine, then the four incisors, two in front on each side. Thirty-two in all, and exactly the same sort of teeth, but they are better developed teeth, but just the same sort, and the number and arrangement in the jaw of his teeth is just like ours; and if we seek to know what his diet is, we find it is absolutely frugivorous. Some of you had the pleasure of hearing Dr. Geil the other night, who gave such an interesting address about the pygmies and other curious people of central Africa. Dr. Geil stated that when he was out in the center of Africa among the pygmies in the great forest where the sun never shines because the trees and the vines are so thick the sun can not penetrate the mass of verdure, Dr. Geil said he asked the pygmy chief whom he knew, ~~what~~ how he knew what

to eat when he went into a new forest sometimes. He said, "If we find a nut and we do not know whether it is good to eat or not, we place it somewhere where a monkey can see it, and we watch the monkey to see what he does. If he eats the nut, then we eat it; we know it is all right. We follow the monkey in diet."

That reminded me of an incident that happened here in this institution a good many years ago. We had with us a very interesting man, Captain Sanderson, who was an officer in the British Army in India. His duty in India was to go out every year with an army of men and capture a great troop of elephants to recruit the elephants of the British army. At that time the British army--about ~~sixty~~ forty years ago, used elephants instead of freight trains. They had very few railroads in India then, and they used the elephants for freight trains to carry their baggage and their military supplies, cannon, and so on. It was his duty to go out into the jungle every year and capture 100 or 200 elephants. He told me he captured at one time, in a single trap, 124 elephants. That is the biggest bag of game, I guess, anybody ever got. He had a thousand men help him to do it, and a very great stockade, miles around; and they drove the elephants into it, gathered together from a great territory, and finally got them into the stockade and captured them all at once. He found after some years he was stricken down with jungle fever as soon as he reached the jungle, so he was incapacitated for his work, and it was a very great distress to him. He studied the matter over, and got some hints from a little book he got hold of from a sea captain, a book that went out from Battle Creek I am glad to say, and it set him to thinking. So when he went back to the jungle, he said, "I am going to watch to see what the monkey eats. The monkey can live in the jungle, and if he can do it, why can't I? And I am going to see what the effect is of following the monkey." And he tried it, and he told me the results. He said, "I found that when I followed the monkey in diet I could follow him everywhere. When I did as the monkeys did, I could live anywhere the monkey could live." And that is

what the Sultan of the pygmies said. "If we do not know what to eat, we watch the monkey to see what he eats; then we eat that, and we know it is safe."

So we are akin to the monkeys, and what is proper for the monkey to eat is proper for us to eat; but the remarkable thing about it, my friends, is that the monkey knows better than we know what to eat; that the monkey has an instinct that can tell him when a thing is good to eat, and when it isn't good to eat; and we haven't. If a man wants to know what to eat, he can get a great deal more information from going into the forest, sitting down and watching a wise ape to see what he eats--a great deal more information than he can get from hunting up a professor of chemistry and asking what are the constituents of foods, and what are good to eat and what are not. Because the professor of chemistry knows nothing about the food except the dead food; whereas the monkey knows its live, vital properties.

Now, here is the horse and the dog. The teeth are very different, and are not at all like ours. The dog eats flesh, the horse eats corn and grass, the monkey eats fruits and nuts and soft grains. That is the human dietary, the natural dietary,--fruits, nuts, and soft grains; but by the aid of cookery, we may also eat dried grains and of course vegetables. If we had followed our natural dietary we would be delivered from nearly all the troubles we have. Very few of you would be here if you had followed the monkey in diet. It is because you have been trying to eat what belongs to the dog, and what belongs to the turkey buzzard, the scavengers and the carnivorous animals,--cheese redolent with putrefaction, swarming with maggots, so-called skippers, and mites which are first cousins to the itch mites that burrow in our skins. Old cheese is swarming with them. And fish that are really far advanced in decomposition,--codfish, halibut, herring and all that sort of thing, and those various dried fishes, salt mackerel, and so on, are simply swarming with bacteria and begin to putrefy so quickly after being taken ~~on~~ into the body; and the poisons generated

generated do mischief, lead to hardening of the arteries, make us old before our time, wear out our tissues, so the blood cells become diseased and attack the body instead of defending it as they ought to do. But it isn't all in diet. There is a good deal in diet but not all. There is a good deal in living outdoors, getting the benefit of the exercise, of fresh air and the sunshint, and sporting in the water.

Here are the cereals. See what a wonderful store of nutriment they have. 100 calories to the ounce, 1600 to the pound is about the average. You can generally reckon cereals as having 100 calories to the ounce. When they are cooked upon the table they are about three fourths water, so contain about 25 calories to the ounce as served upon the table. Flesh foods have on an average less than half the value. There are only a few flesh foods, like cheese, ham and bacon which contain a great amount of fat, contain a higher value. Fish have only about one third the nutritive value of the cereals. Cereals have 1600 calories to the pound, and the oyster has only 235. As a matter of fact, a pint of oysters has less nutritive value than a pint of milk. A pint of oysters has only about half the food value of a pint of milk. These creatures have almost no food value at all. Beefjuice, counted as being so wonderfully nourishing, has only 115 calories in a pint--just think of it; and an ounce of rice contains as much nourishment as a pint of beeftea. And it is only the fat in the beeftea that is nourishment. Take the fat all out of it, and it will have really no nutritive value at all; because beeftea is simply made up of excrementitious substances; it has the composition really of urine.

Here are the nuts. See what enormous nutritive value they have,--nearly double that of the cereals, you see,--300, five times the nutritive value of meats. No foods known to man have such a wonderful nutritive value; so wonderfully rich in stores of energy, health and tissue forming material, as nuts.

When we come to vegetables, the nutritive value is low, it is true; there is

almost no protein, and few carbohydrates; but the vegetable contains a large amount of very valuable salts, alkaline salts which are of very great value to the body. And the fruits are also very rich in salts which are of very great value to the body. The actual value is about the same as that of green vegetables,--very much less than the cereals; but fruits have this advantage, that when we take them, we take the food in a digested state, ready to be assimilated immediately, and immediately available. When you come to consider the digestibility of foods, you see a marvelous difference. Rice is digested in one hour, whereas roasted pork requires five hours; just think of it. Fried eggs require three hours, and other meats also require time for digestion, four or five hours. Stewed oysters three hours and a half,--more than three times the length of time of rice, while the nutritive value of rice is twice as great.

There is nothing in the animal world which compares with the beauty, and the freshness and the glory of these splendid fruits and vegetables the Creator has designed for our sustenance--nothing equal to them. A beautiful pear, a luscious strawberry--how it tempts us to reach out for it. But whoever thought of reaching out after a bird; and whoever thought of seizing a rabbit and taking a taste of it? There is no such instinct in us. Our normal instincts rebel at the use of flesh, at the flesh diet; but it is only because we are drilled in it, trained to it from infancy that we can tolerate these horrible things.

I want to say a word about the outdoor gymnasium, for this is the time of year when it comes particularly into play. Some of you were at the swimming exhibition this afternoon in the indoor gymnasium. We are getting ready a running path across the road, and getting a new outdoor gymnasium ready as rapidly as possible. It will be ready in a short time, and we hope to induce a great number of people this summer to live outdoors as much as possible, to get you into the habit of living outdoors while you are here, so when you go home you won't forget it.

Isn't that a beauty? Three of the products of Minnesota, and this baby is the finest of them all. Why aren't we all as fine as that? Why don't we remain fine? We are born fine, but we get spoiled. It is because we depart from Nature. If we can keep close to Nature, close as that baby is, as close as the squirrel does, and the birds, we would not so early fall into decay and get to be poor, miserable, wretched specimens of disease; but would retain our freshness, vigor and efficiency, and live on and on to a good old age. We do not need to die at thirty or forty. If we die at all, we ought to die at 150 or 200 years. Mr. Wu Ting Fant says he is going to live to be 200 years old. He has become a flesh abstainer in the last ten years, and from a chronic invalid, has become a strong, vigorous, healthy man whose efficiency is wonderfully increased. He is coming back to this country, I understand, and if he does, I am sure we shall see him here. I had a letter from him the other day, and he says he has organized a society of flesh abstainers in China, and that the most eminent officials there have become members; and that he has started a vegetarian restaurant, or got a very popular restaurant in Shanghai to introduce a vegetarian department, and they have a meeting once a month, and they are becoming very greatly interested in these vegetarian ideas. It is not new to the Chinese by any means, for they have vegetarian societies there, and once in a while a man may be found going about the country telling the story of the poor cow that they used to lead about but were not allowed to eat; and by and by when the famine came the cow was slain and actually eaten; first she was allowed to starve, and then slain and eaten, and she finally ends up her lament by saying, "When I am a man, and you are a cow, I will treat you then as you treat me now." But I must let you go. Good night.

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