

THE INTERNATIONAL CONGRESS ON TUBERCULOSIS

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

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You have all seen in the newspapers lately, I am sure, accounts of what has been going on in Washington. I have been down there, as I had to read a paper there, and I am sure you would all have been interested if you had been there, for there were sections which were of interest to all classes. There were sections 1, 2, 3, 4, 5, 6, and 7, and each of these different sections was devoted to a special subject. Section 5 gave particular attention to the social and economic side of this great question that is being studied at the present time by all classes of humanitarians, by all classes of science who are in any way related to the science of medicine. There were there pathologists who studied it from the standpoint of the microscope and of the laboratory; there were surgeons who studied it from the standpoint of the surgeon; then there were internists, as they ~~are~~ are called, and practicing physicians who practice so-called internal medicine, who consider it from the standpoint of the bedside physician. So all these different departments were represented, and the sections were very largely attended, and all the different phases of the subject were discussed.

I am sure this is the most important meeting on the subject of tuberculosis that has ever been held, and it was evident that all civilized countries were represented here, and not only all civilized countries, but half civilized countries as well. We hardly

know where we should class Japan--perhaps three quarters civilized; but Japan was represented by scientific men, and China was represented also. When Mr. Wu Ting Fang was here, he received a telegram which he read to me, a telegram from Shanghai asking him to appoint two delegates to this congress. He talked to me about what sort of delegate was wanted, and I did what I could to assist him in getting hold of the right sort of person; and I found when I was in Washington that he had appointed his two delegates; so China was represented.

Every intelligent and enlightened nation in the world is interested in this question, for it has come to be recognized by everybody who knows anything at all about it that tuberculosis is the great scourge of humanity. It is undoubtedly the greatest of all scourges of humanity. Every day we see that; because nobody escapes it unless they die early, and they have to die very early to escape it. Nobody escapes it. Here in this room there is perhaps scarcely a person, surely not a person more than thirty years of age, that has escaped tuberculosis. Every one of us has had it. The most of us have got some of these germs lurking about us now. Post mortem examinations show that everyperson over thirty years of age has had this disease in some form. It does not confine itself to the lungs. The most common form in which we see it is tuberculosis of the lungs. You see a person coughing, coughing, raising, raising, emaciated, pale, wasting away, and you say he has got tuberculosis; but now here is a ten-years-old boy that has got a diseased bone, has got a carious bone,--that boy has got tuberculosis too. Here is a little girl going to school who has got some lumps on the side of her neck--she has got tuberculosis too. An examination of the school children

in one of our large cities, in a number of schools, showed that half of all the school children had tuberculosis. They had tuberculous glands.

Now, it is known at the present time that consumption, so-called disease of the lungs, comes very largely from these tuberculous glands. This form of the disease starts in the neck, and sometimes it works downward into the lungs, but more often it starts from the interior, starts from little glands in the abdomen and works upward into the space between the lungs, then works outward into the lungs themselves; so an enlarged gland is not simply a deformity. It has been recently discovered that these enlarged conditions of the tonsils in many, many cases can be attributed to nothing less than this very same disease--tuberculosis.

So it is coming to be a tremendous thing, you see, when the people who are thirty years of age or over, almost every one has tuberculosis in some form, or has had it in some form. When we recognize that fact, and then when we remember that from one seventh to one-eighth of all the people who die die of this one disease, we see something of what an awful thing it is--what an awful thing it is! And it is abroad; it is abroad in the land; it is not shut up somewhere. If you want to get small-pox or some other disease, you have to hunt up a patient who has got the disease, and come in actual contact with it, with the patient who has it, in order to get it; but you do not have to go to so much trouble to get tuberculosis. All you have to do to get tuberculosis is to sit down in an ordinary concert room, or an ordinary sleeping car, and just breathe the dust the porter is stirring up, or that the janitor has been stirring up. The porter on the sleeping car takes particular pains to inoculate us. Every one on the car has to breathe that

dust, and every physician knows that in breathing such air one is almost certain to be taking tubercular germs down into his lungs. There is scarcely any possibility of escaping it, for the dust of sleeping cars is almost always found to contain these germs. The dust of concert rooms, theaters, churches and every other place where people get together is found to have these germs present, and it was formerly supposed that was the principal way in which the disease was contracted, by breathing in germs. The dust of streets of cities always contains more or less tubercle germs, but it is now found that that is not the only way in which tuberculosis is contracted. Professor Ehrlich at any rates takes the position that the disease comes ~~not~~ ⁱⁿ through the stomach rather than through the lungs; that we swallow milk containing tubercle germs. Ten per cent of all the cows in the country have got tuberculosis and in using milk right along we are swallowing tuberculosis by the wholesale. Many children who go to school have tuberculosis of the tonsils and they drink out of a common cup and in that way other children are inoculated. An examination was recently made of the public cups from which school children drank, and tubercle germs were found adhering to these cups in large masses. Every child who has tubercular tonsils inoculates the drinking cup, and every child who comes along and drinks out of that cup afterwards is inoculated with the same thing, but that is a small thing compared with taking down a glassful of tuberculous milk. Suppose here is a herd of cattle, and there is just one cow in that herd of 100 cattle that has tuberculosis, but the milk of that cow is mixed with the milk of the rest and it inoculates them all. But there is something worse than that. It has recently been found out at Washington in some careful studies which have been made there that there is something immensely worse than that.

The cow that has tuberculosis expectorates just as a man or woman does who has tuberculosis, or the child. The baby always swallows the sputum: a child has to be several years old before it can be induced to discharge the sputum. The cow always swallows its sputum just as the child does, so when a cow has pulmonary tuberculosis the fecal discharges always contain large quantities of tubercular germs, so it is now found out how the tubercle germs get into milk: they go right along with the barnyard dust you see into the milk and milk is one of the very best things in which tubercle germs can grow. It is one of the very best mediums for them to develop in. The government reports that have been recently published show ^{will} that when a cow has tuberculosis its fecal discharges ~~xxx~~ always abound with tuberculosis, and even though the milk obtained directly from the udder does not contain any germs, the milk which is produced in the ordinary way is certain to contain germs itself. The cow becomes smeared with its own excreta and this is dried and rubbed off into the milk and in that indirect way the germs find access to milk, so you see what a problem this is. How can we escape it? Here it is in the dust of the streets and in lecture halls that we attend and in the sleeping cars we ride in. Everywhere we go these tubercle germs are ever present with us. How can we escape it then? That is one of the great problems which was considered at the Congress, how to escape this awful malady that is preying upon humanity, weakening the stamina of the race, carrying off so many millions every year.

Professor Irving Fisher, professor of economics at Yale University calls attention to this astounding fact that tuberculosis costs in sickness and death in the United States no less than the enormous loss of one billion dollars a year: yet this is a disease that can be wiped out; that can be dispensed with; we can get rid of it; we need not have it; it is a germ disease; it is an infection and an unnecessary disease. It is to a large extent a filth disease because it comes from dirty milk; also

from eating the flesh of animals, and sometimes in sausage particularly. Sausage is often very likely to contain fragments of diseased organs: the butchers do not always know the significance of things, so when they have fragments of things they would not put on the market they throw them in the hopper and they are ground out into sausage. Bologna sausage, which is supposed to be a little better than the rest is really the worst because when you get pork sausage you know just what it is: it is a pig and you know how filthy the pig is; you know all about it, but when you get bologna sausage the Lord only knows what is in it. It may be any sort of a piece from a tuberculous ox to a fragment of a spring chicken or a mewling cat: it might be even a dog: all things have been found in sausage: there is no question about that with reference to bologna sausage. It is ~~now~~ known that a butcher has the habit of working off his odds and ends in various ways and particularly in the shape of sausage, and there you are particularly likely to get it because you eat the sausage often without cooking it very thoroughly. It is only partly cooked, and not being thoroughly cooked the germs are alive and lively and ready to grow you see, so it is a particularly dangerous form of flesh to eat, and it is now known perfectly well that tuberculosis of the lungs may often be developed as a result of the eating of tuberculous flesh: it goes through the stomach and when the stomach does not become infected at all the germs often travel through the wall and get into the glands, get into the lymphatics and finally get into the mediastinal glands of the chest and down into the lungs.

Now the great problem studied in Washington, was how can we get rid of this beast? How best can we fight it? The people of Washington swarmed in in great numbers, filled the assembly room, the President welcomed the Congress, great physicians were there from all over the world, and, as I

remarked ~~xxxx~~ a few moments ago, each civilized government had a representative there: they sent their foremost men, foremost scientists, their most renowned ~~xxx~~ physicians. It probably was the most distinguished and learned body of medical men, of recognized scientific men, that have ever met together on the face of the earth: in the whole history of the human race there never was such a congress of eminent and erudite medical men as were gathered there. We have had larger gatherings of medical men, but they were simply common every day medical men who work very much in a routine, but here were men that were foremost in their profession; men that had become famous for their discoveries; that had world wide reputations because of discoveries which they had made. These men were there to compare notes, to discuss this question, How shall we battle against this disease?

Now there is one other question which perhaps more than all others occupied the attention of the scientists there, and that was the question of immunity, and what was immunity. When I was a boy I had the mumps one time, and I remember it very well. I was about ten years old and I caught the mumps from my neighbor's boy, and one side of my face swelled up and it was very painful and I could not eat ~~my~~ fried sausage as usual and other abominable things which I had not yet learned to avoid, and I was very unhappy and miserable. I asked my mother "How did I get the mumps" She said, "Oh, you caught it from Tommy Jones when you played with him the other day: he had the mumps; he was sick at home with the mumps a few days ago, and now you have come down to it. You were exposed to it by playing with him." I said, "Mother, how can I ever get over it because here I am exposing myself all the time. How am I ever going to get over it?" and ~~xxxxxxxxxxx~~ it worried me very much because I didn't see how in the world I would ever get well when I had the mumps and was constantly exposing myself to it. If

I caught it from a boy playing out doors how should I ever get well when I might catch it from myself all the time. That was the question that troubled the doctors for a good many years, and I never found the answer for it. The answer had not been found then. When I studied medicine thirty-five years ago nobody knew the answer to that question, and it is only within the last few years that that question has been answered, but now we know that when a germ grows in the body and produces the poisons in the body that the body itself develops something new. A new condition is developed in the body: the body takes on new power it did not have before: it acquires the ability to fight that germ: there is something new developed with which the body can fight off that germ. It is one of the most marvelous ~~things~~ manifestations of the divine care of our body, of the intelligent, beneficent watch care that is exercised over us: one of the evidences that the same power that made us is still looking after us and taking care of us. The fact that when a person contracts a new thing that God never intended he should have that there is a new thing done in that person's body in building up a wall of resistance against that thing; that something new is produced that was not there before and that was not originally intended to be there, ~~xx~~ a thing that does not belong there, that is there only because of this emergency, is one of the greatest evidences my friends that the same power that made us is constantly caring for us. Here is a germ gets into the body and it produces a poison that was not in there before. ~~xx~~ Now there is produced in that body a thing that was not there before to meet that condition, an antidote for that poison, and the body itself takes on new power which it did not have before--The ability ~~it~~ to fight that germ successfully; to battle successfully against that particular germ, so whenever that body is infected again by that particular germ no harm is done for the body has power to fight it. It has power to defend itself

against it and to kill the germ. Now the reason why a person recovers from mumps then or typhoid fever or small pox or measles or any other infectious disease is simply because there is developed in the body this condition of immunity. Sometimes this condition will last a lifetime: a person who has had smallpox once does not ever have it again, but a person may have diptheria once and then in six months have it again, because immunity lasts only a few months or a few weeks. Measles or mumps generally produce immunity which lasts for a lifetime, but that is not ture of diptheria and it is not ture of tuberculosis. This immunity which is produced by the disease itself lasts only a short time. Immunity is produced but it lasts only three months or six months perhaps, then a new infection takes place

But there are two kinds of immunity--natural immunity and artificial immunity. The poison is produced in test tubes, and it is carried in the tubes and injected into the body. That is exactly what is done when a child has diphtheria. A horse has been injected with the diphtheria poison in increasing doses--a small injection today, a larger dose tomorrow, and a larger dose the next day, and so the injection is increased until the horse can take enormous doses without any harm at all; it can take poison enough to kill several horses if given at first, because such tremendous resistance has been developed. Then some of the blood is taken out of the horse's veins, and the serum is taken out of it, and this serum is put up in little tubes, and when the baby gets diphtheria, the contents of one of the tubes is injected into the body of the child so the child gets the benefit of the resistance which the horse develops, you see. The experience of the horse is used for the benefit of the child.

Now they have been developing a similar plan for producing immunity in human beings. It would be a fine thing if a person found out he had tuberculosis if he could just send down to a drugstore for a tube, have his arm injected, and in a few days find himself well. That is what certain doctors are working for. But the developments of this Congress, and the facts that have been brought out in very recent times have made it clearly apparent that such a thing can never be; that such a protection against tuberculosis will never be ~~annexed~~ secured. Why? Because it is discovered that this thing which produces immunity against tuberculosis does something else to the body. This poison which is an antidote for the

tubercle germ, which develops that condition of immunity in the body, produces an opposite and a baneful, a most harmful change. It produces a chronic disease of the kidney exactly of the nature of Bright's disease. In other words, it produces actually Bright's disease of the kidney. So experiments made upon dogs succeeded admirably in making the dogs immune, but they all died. And it was found the more immune the dog was made, and the more certain it became that the dog could not contract tuberculosis, the more certain the dog was to die of disease of the kidneys; so you see that kind of immunity nobody wants to have.

Here is a thing to be recognized in relation to tuberculosis. This disease itself while it is making mischief with the lungs, perhaps, or making mischief with a diseased bone perhaps, a tuberculous bone, at the same time it is working havoc in the kidneys, for the poisons being produced by the germs absorbed and circulated in the blood are coming in contact with the kidneys for elimination, and the kidneys are being more and more diseased; so when a man goes to a sanitarium and gets well of tuberculosis--I am going to show you something about that on the screen tonight--when a man goes to such an institution and gets well, then goes home discharged, cured, in a year or two he has evidence of Bright's disease of the kidneys. More than one such case have I seen. It is a common observation of many physicians who have had a large experience with this disease, to be called in to see a man who is cured of tuberculosis, who a year or two later dies of Bright's disease. It is understood now why it is. In the post mortem examinations made at the Phipps Institute in Philadelphia, where there has been a more scientific study of this subject than in any other place in the world, it is

found that 86% of all the people who die of tuberculosis of the lungs, 86% of them all had Bright's disease of the kidneys, or tuberculosis of the kidneys, and 95% of them all had diseased livers as an indirect result of this disease. So you see that is another thing to be taken into account. When you see a person sitting down at the table, as I saw at a sanitarium some time ago where I was visiting,--saw the patients sitting down around the tables heaped up with great platters of meats of various sorts--roasts, steaks, stews, turkeys, chickens,--almost every sort of beast was brought on, the patients were induced to eat as much meat as possible. It looked to me as almost homicide, because every one of those patients had threatened kidneys, crippled kidneys, and were doing the thing that was the worst possible thing that could be done for diseased and crippled kidneys. Every scientific work on the practice of medicine points out the fact, and every physician knows that the man who has diseased kidneys must avoid the use of meats; that meats are the worst things possible for diseased kidneys; so meat must be excluded from the dietary. Suppose here is a man with tuberculosis; he has got not only tuberculosis, but he has got crippled kidneys, and he must not forget that; and he has got a diseased liver also, and must not forget that. This disease causes mischief in the kidney and the liver. And it is a matter of fact that a man with tuberculosis of the lungs dies because of crippled kidneys. It is possible for a man to live with one half of one kidney lung; for we have got four or five times as much lung capacity as we actually need. If we did not have, we could not run to catch a train. We ordinarily use only about a pint of air, but it is possible for us to breathe two pints of air or more. Less than 30 cubic

inches is the amount we breathe out ordinarily, while the actual capacity of the lungs is 300 cubic inches; so we have a large excess of lung capacity. And if a person just moves along at a reasonably moderate rate does not require the excessive lung capacity and can live a long time with half a lung; so you see, as I said before, a man who has tuberculosis of the lungs does not die of the crippled lung; what that man really dies of is crippled kidneys and crippled liver; that is the thing that kills him. The liver and kidneys are worn out eliminating the poison produced by this disease. So there is an insuperable obstacle in the way of immunity. Man does not want these poisons injected into his blood in any quantity; nor does he want the immunity which comes from an attack of the disease in a mild form. It is a kind of thing you do not want anyhow, because, while it cures you or relieves you of tuberculosis, it makes it almost certain you are going to die of Bright's disease, if not right away, any way before you ought to.

Now, is that the only thing to hope for, then? No, thank Heaven, there is something a great deal better, and that is the natural immunity which God made it possible for every man to achieve, and it is the immunity most people do achieve. The fact that we are here tonight and that not one of us is likely to die of tuberculosis,--but I must not say that, because some of us are going to get it after while, because we are going to disobey the laws of health we are going to backslide and going back to things we ought to escape and keep away from. Some of us, I fear, will go down that bad road. I feel pretty safe myself, for I am going to keep away from evil things and for another reason too, that I am going to tell you about pretty soon. Now, we have had it, and we have recovered from it.

So we have proven, by the fact that we are here tonight, that we have the ability to rise above it. Post-mortem examination shows that everybody over thirty--of course I am leaving out the young ladies here tonight--everybody over thirty has had it and gotten over it; so we are alive and haven't any symptoms of it now. That shows, doesn't it, that we have a natural immunity, that it is possible for us to fight this disease successfully; that we can kill it off. Now, fortunately, the recent modern discoveries have developed a method of testing the condition of any individual. If any of you here want to know whether you are going to have tuberculosis, are likely to have it again, can find out. It only takes a little drop of your blood, taken in the laboratory here, and this drop of blood is made to play a football game, so to speak, against tubercle germs. Here is one on one side, and tubercle germs on the other, and they are brought together under a microscope where you can see them, watch them and see the blood swallowing up those tubercle germs, you can watch the process; so they are taken in one after the other. This process is allowed to go on for fifteen minutes, then the blood is taken out and it is ascertained how many of those tubercle germs have been captured by the blood-cells which are present there. A certain number of blood-cells have to catch so many tubercular germs in fifteen minutes in order to indicate proof. That is 100; and when that is the case, that means practically normal resistance, and such resistance that tubercle germs have no terrors for you at this particular time. But your tuberculo-opsonic index, as this indication is called, may be low, it may be zero. If you are a man, you may go off and smoke a cigar, and your opsonic index may go down to zero. Smoking one cigar may

bring it down to zero. Tobacco is one of the worst things in the world against the tuberculo-opsonic index, and so is alcohol. Alcohol and tobacco, as we have proven right in our laboratory here, and Prof. Wright who discovered the opsonic index in London--I was in his laboratory a little while last year,--Prof. Wright has demonstrated the same thing--that tobacco will depress the tuberculo-opsonic index woefully; and that agrees with the discovery made at the Phipps Institute in the statistics they have been gathering the last few years. They have shown that the man who uses tobacco is twice as likely to have consumption and to die with this disease as men who do not use tobacco. The idea that tobacco is such a noisome thing that it frightens germs away and so its use is justifiable is entirely a mistake. It has just about as much reason and sense in it as there was in an excuse given by a certain doctor of my acquaintance some years ago for smoking,--a doctor who said he smoked because he saw a red flag out in front of a house, and he smoked to protect himself from catching the small-pox. This excuse--that smoking tobacco will frighten off small-pox germs, was just as reasonable as the idea that tobacco would protect a man from getting tuberculosis, by disinfecting the air as it came in, disinfecting his mouth to kill germs,--just as reasonable as the boy who was caught smoking in his room in a seminary where it was against the rules to smoke, and he said he smoked because he had corns, and he thought the smoking would somehow help to cure the corns. And these are just as good reasons for smoking as any other reasons you ever heard given, and just as good as this reason--that tobacco is good to prevent one from taking consumption.

It is borne out by the statistics actually gathered that the men who smoke are twice as likely to have consumption as those who do not smoke.

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The reason is shown by Professor Wright, who found that the use of tobacco lowers the opsonic index. That is ~~the~~ reason enough, because it is a demonstration of the fact that it lessens the resisting power of the body. Anything that lowers the opsonic index , anything that lessens the resisting power of the body , is an open door to consumption: it is an invitation to consumption. Then don't you see my friends, the thing that is necessary is to raise the general vital resistance of the body, raise the opsonic index. Well, the doctors have been saying it is very necessary to eat a great deal of meat in order to have a good high opsonic index. Dr. Foster, over in England, at the last Congress reported experiments which he has been making on dogs, and he had put these dogs on a low protein diet and the opsonic index went down, so before I went down to the Congress I ~~had~~ said, "I am going to inquire myself for some facts, and we had the opsonic index obtained from a whole lot of people who had been living on a low protein diet for anywhere from ~~ten~~ to twenty years or more, and I found that the man who lived on the lowest protein diet, who had the least protein, and had been living on the low protein diet for the longest time, had the highest opsonic index, and I am very proud to say that was myself. My opsonic index was 195. I never heard of anybody who had an opsonic index quite so high as that before. I think that is about the fiftieth degree of that particular cult. Now our average of fifty or more was 126, which was ~~away~~ above the normal. There was only one who had an opsonic index a little low, so you see the cure for consumption is to be found not in killing the tubercle germs, because you cannot find them; they are scattered every where; not in dodging the germs, for you cannot doge them, they are alighting upon you from all sources; not in vaccination or hypodermic injections, artificial methods, because they produce Bright's disease and makes more mischief than it cures. How then is it? Simply in raising the vital stamina of the body above the reach of ~~tuberculosis~~ tuberculosis and keeping it there, and here is the most

wonderful thing, the most beautiful thing about that: when you get yourself so high up that tuberculosis cannot reach you you are safe from anything else; there is hardly anything else that can get you. If you vaccinate yourself against tuberculosis you are just as liable to anything else as you were before. It does not protect you at all. Artificial immunity protects you against only one thing and that is tuberculosis, but the natural immunity that comes from right living, from obedience to the laws of health, from conforming to these principles which are innate to our ~~body~~ bodies, which are intrinsically necessary to the enjoyment of perfect health and the proper performance of all our bodily functions; in other words, obeying the divine laws of health which God made for us when he made us; that grow out of the relation of our bodies to their environments; that are natural to us; obedience to these laws produce immunity which makes us proof ^{all} against diseases which it is possible for us to resist, so we are able to resist them all alike: so you see then that the important thing for us to think about and to study is how to live, how to exercise, how to care for ourselves in such a way that we shall develop natural power of vital resistance. That is why we use cold water my friends to develop resistance? What for? It is not ^{to} do something to make things interesting for you; that is not the reason why we use cold water in rubbings, douches and various applications, but the purpose of cold water is to develop toughness, to develop endurance, to develop stamina, to develop resistance to disease, and when you find you have got good resistance to cold water and get a good reaction from cold water, can enjoy cold water, feel exhilarated and lifted up afterwards, that is evidence that you are getting your resistance up; that you are climbing up; because that is the state of high resistance. High resistance to cold water is high resistance to disease: it is the same thing: the two ~~go~~ things go right along together. Resistance to fatigue is

another thing; resistance to fatigue and exhaustion; resistance to nervous fatigue; resistance to physical fatigue, indicates power to resist tuberculosis itself, that is, to a certain degree, so the whole thing is to get your body into a state of high health, pure blood and plenty of it, a high blood count, a high percentage of hemoglobin, a high state of bodily endurance and functions.

Now there was a great deal of talk at the Congress about other things; about how to cure this disease, how to deal with the disease in its various phases. This was one of the most interesting things that was done there. The germ of tuberculosis was presented in all its different phases; pictures upon the screens in various places so it was possible to get a look at them as they really are, some of them even in a live state. This is the way these germs appeared under the microscope. Here are the little germs and here are the white cells I was telling you about that swallow them. Here is a white cell that has been swallowing some of these germs you see. Most of these tubercle germs are outside and these are the white cells in the blood swallowing the germs and destroying them. They actually ~~dissect~~ dissect them, live upon them. Here is the man who discovered the tubercle germ--Professor Koch--and he was the most honored visitor at the Congress. When he stood forward ~~ixm~~ upon the platform to read his paper the whole crowd assembled arose and cheered for several minutes successively. They certainly did worthy homage to a worthy man. Dr. Koch took up this subject more than twenty years ago; in fact it was about twenty-six years ago; just twenty-six years ago that he discovered this germ. It interested me very much: I saw what he had been doing over there, so as soon as I could possibly get affairs into shape here I went across the ocean to visit the laboratories

of Europe to study the thing for myself, and I made a study of the tubercle germs in the laboratories of Professor Stricher in Vienna, who was one of the pupils of Prof. Koch. I made a study of it and became thoroughly convinced that his discovery was genuine. At that time, however, it was very much laughed at in this country. Very few people had any faith in it twenty-five years ago, and it was a very long time before people became thoroughly convinced that the tubercle germ was a reality, and that this disease could be communicated from one person to another, from one animal to another from human beings to animals and animals to human beings. Here are some of the things found in the abatoirs.

Some years ago I sent one of my assistants down to Chicago, had him spend two or three days in the great slaughtering establishments there in the abatoirs to see for himself just what was done, and as he stood there watching the killing of the animals and their viscera being removed one after another he saw the inspector step up occasionally and point to a liver or lung or something that must be rejected, and the inspector turned these rejected parts over to him so he had a great box full brought up here. I exhibited them in the town, showed them to the society and they got so obnoxious that they were turned out. ^{Everybody} ~~Nobody~~ wanted to see them and they really made a disturbance because so many people came in, so we put them out on the street and the police came along and said, "This will never do to have people coming along and looking at these awful things; it will never do at all" So I said, "Very well Officer, we will fix it." So I put up a fence just breast high in front of a long table which stood along the sidewalk, and put outside the fence a sign "EXHIBIT OF DISEASED MEATS BEHIND THE FENCE" and you know there was a whole line of people standing on tip-toe and peeping over that fence all the time, and everybody who came along wanted to look over and see, and I don't think anybody went by without peeping over the ~~fence~~

fence: in fact we got more attention than before we had the fence at all: it was very satisfactory to me. I was told that the butchers complained very bitterly for several weeks afterwards that they didn't have very much demand for meat. These are some of the actual pictures. Down in the congress that was one of the conspicuous features of the exhibit.

There was a large exhibit in which were enormous masses of animals completely filled with tubercles, whole great masses of lungs, the great lungs of an ox completely filled with tuberculosis and all sorts of tubercular organs.

Here is a liver you see with great masses of tubercles growing in it.

Here is the inside of the chest, showing the pericardium about the heart and the inside of it all covered with tuberculosis. There are two splendid fine looking animals and this is the heart of one of them. You wouldn't think there was anything the matter with these animals: they look perfectly healthy.

Scientists have discovered a means by which diseased conditions of the animal can be determined even when they look perfectly well by the injection of a small amount of this poison I told you about, which is used in producing artificial immunity. This material is called tuberculin: some of this tuberculin is injected into the tissues of the animal and if there are any tubercular germs there will be a rise of temperature in the animal, and the animal can be killed and in some part of the animal this diseased condition will be found. Here are tuberculous ulcers on the intestinal wall of an animal—a sheep or a cow. Here is a heart, showing the pericardium here completely covered with tubercles. I have seen the pericardium an inch thick in cases of this sort. Here is another mass of liver showing the great masses of tubercles and abscesses formed in the liver. Here is the pancreas. You see the sweat-bread with the tubercles all along. Everyone of these little radiating spots here is a mass of tubercles and when people eat sweat breads

they very often eat tubercular masses; perhaps that is what gives them such a delicate flavor. Here is a case where the same disease attacks the face and it has been found that this tuberculosis of the face, or lupus, and tuberculosis of the bones comes generally from animals. It comes often from the use of diseased meats and milk. One can easily see how ~~that~~ they can get it upon the hands from handling diseased meats or ~~xxxxxx~~ upon the face from touching the infected hands to the face. Here is a part of a healthy lung and here are the air tubes. Here is the space between the lungs, and the lymphatic glands, and these glands extend up along the neck and down into the throat in the neck and they go down and communicate with the glands in the abdomen, so when there is infection in the tonsil it may extend down along these different chains of glands: it gets in here and then possibly along these channels and in that way penetrates the whole lung. This is the way the disease travels. Here is a case of tuberculosis of this very sort. Here are glands filled up with the disease. These were specks not bigger than a grain of wheat but they have grown to be enormous tubercular masses between the lungs and extending into the lungs. The lungs have not yet become infected but these are tubercular glands in the lungs of a child. It is a common thing to find this condition of lungs in a child.

Fortunately we don't have to have any question about the diagnosis now days, because the X-ray examination shows the glands there and we can see the masses: I have seen it with my own eyes. Here is another case of the same sort. You see the enormous glands in great enlarged masses that fill in the space between the lungs. Here are some ~~un~~healthy lungs and a healthy heart and the glands growing right in around the heart and behind the heart. Here is where the glands have become enlarged and the disease has extended into the lodes of the lung and around the large tubes. These are the bronchial tubes which have become taken by disease and these are masses of

tubercles. With the X-ray now it is possible to look through the chest and see a single mass of tuberculous tissue, sometimes enormously developed and sometimes not larger than the head of a pin, but the X-ray will ~~pick~~ *pick* them out with great certainty, so that the diagnosis need no longer be uncertain in these cases, and this shows how the lung becomes infected, and how the cavity forms in the lung. Here is a pneumonic process in the lung. Here is another case of pneumonia in the lung and another infected area where the tubercle germs have formed and broken down the tissues and been discharging out of the body. Here is another case of consolidation of a portion of the lung. You see the tubercles deposited all around here upon the surface of the lung in tuberculo-pleurisy. Here is another piece of liver showing the diseased conditions here: masses of tubercles are deposited. This shows the circulation of the lung. This is the lung in its congested state. We want to relieve that congestion: what can we do? We have a pack put on, and this shows the compress on the outside. Here is a pack behind and here is a pack in front, and these packs draw the blood to the surface and in that way relieve the congestion of the interior. The blood is drawn into the skin so the lung is relieved. Here is another tuberculous liver, and you see the little white specks all over that, and each one is a group of tubercles. When you are preparing liver for dinner after you go home or your cook is preparing liver for dinner, when you see some of these white lumps there you may know that these are tubercles. If you haven't time to do that, to inspect it, it would be better not to eat liver at all. Every bit of liver ought to be examined because it is so certain to be diseased and the disease is so likely to be overlooked. Here is another mass of diseased tissue here, but this is not tuberculous. This is a gall bladder and a large number of gall stones in it, but this is

~~xxxxxxxxxxxx~~ entirely outside of the present subject and evidently got slipped in here by mistake.

Now here are three remarkable men who are entitled to the thanks and gratitude of the whole human race: they are splendid pioneer men. Here are two splendid Germs--German physicians--who forty or fifty years ago began to treat pulmonary tuberculosis by the outdoor method. And here is Dr. Trudeau, ^{Dr. Bachner?} Dr. Kramer and Dr. Detweiler. Dr. Trudeau has a place you know up in the Adirondacks, near Sananac Lake. He was the pioneer of this outdoor treatment in this country. From the little work begun by Dr. Trudeau in the Adirondacks some thirty years ago these sanatoriums have extended until now they are to be found all over the country. This shows you what you may see in Germany; here the tuberculous patient has a little hut of his own and a Sedan chair, and he is ~~xxx~~ carried about by the sturdy mountaineers. He is too feeble to walk about himself. In these Alpine climates these people are found to be living outdoors all winter. I visited Davos some years ago, but I will show you that sometime later. This shows you a quilted sleeping pack: the patient is bundled up in the pack and does not suffer anything from the cold. He is more comfortable than the man indoors. Here is a tent put up here around the chair as a wind screen to keep the wind from blowing unpleasantly about the head and ears.

This is at Rutland, Mass., the State Hospital there, and these are rows of consumptives who are sitting out on the open porch. It was a cold winter day when I was there a number of years ago, and I said to the Superintendent, "What temperature do you keep the rooms inside?"

"The same temperature as outdoors" he said.

"Don't you have any fire?"

"Yes we have the heat turned on thirty minutes in the morning and thirty minutes in the evening for dressing and going to bed. "

"Don't you have it on any other time?"

"Never"

"Don't you have the heat on at dinner time and breakfast time?"

"Oh, no."

And he said, "When it is very cold weather our patients go out of doors to get warm, because it is colder indoors than out of doors. "

It happens that this picture was taken on a rather warm day and there was several ladies trying to write letters home, but they were all bundled up with hoods or great shawls about their heads and thick mittens on their hands , and were trying to write letters home, but they were all bundled up ~~xxxx~~ and warm and comfortable, although there was no fire, and these patients were getting well. That is the beautiful thing about it: Sixty per cent of all the patients received were sent home cured and a large proportion of the remainder were very greatly helped.

This is ~~xxxx~~ what I saw at ^{*Basle*} ~~Basle~~, in Switzerland, in an open air sanatorium--a sanatorium with outdoor arrangements and so that the patients eat and sleep and stay out doors all the time, and ~~xxxx~~ that is the old system, but there is something better than that. Here is an arrangement for sleeping out doors in your own bedroom. Here is the patient's head inside here, and this shows how the air comes inside so the patient has exactly as much fresh air as though he was out doors. The window is raised at this place and the end of the bed is slipped out and he is sleeping with his head out of the window, and that is a very good way of getting advantage of the outdoor method. And here is another method of having the room ventilated by having a window open on each side of the room so the wind can

sweep through. Another plan which has been suggested recently is a very good one: There is a little recess in the side of the room and then a partition is put across so as to fence it off from the rest of the room, so at night you can shut it in and in the day time the windows can be put up and the whole thing raised, and the clothing will be warm and dry and when you go to bed at night this door is closed and you can raise the window and go to bed and sleep in the fresh air all night. In that way the house itself does not get cooled off. Here is another method of ventilating the rooms. Here are windows in the sides at right angles to one another. That is the way I have been sleeping for a good many years in the winter time. I have to sleep indoors in order to be close to the telephone. Very often on cold winter mornings I wake up and find several inches of snow on my bed. I do not feel quite comfortable unless I have the fresh cold air blowing in my face all night.

This is what you see at Davos ~~anytime~~ anytime during the winter season. The snow is six or eight feet deep there. All of these rosy-cheeked people have got tuberculosis, every one of them. They take long toboggan slides ~~down~~ three miles down the mountain side, and then climb up again, so they get the benefit while climbing up the mountain rather than while sliding down. It is the exercise, expanding the chest and breathing the oxygen, expanding the lungs and building up the resistance of the body which cures the tuberculosis. Here is a model tent which has ~~received~~ received the prize. It was invented by Professor Fisher. The sides are moveable and there is perfect ventilation so that the air is moving about continually. As the air is warmed up it rises and goes out at the top and fresh air comes in at the bottom all the time. Here is the Adirondack Cottage Sanatorium. This is the main building of the establishment: you see it is a beautiful place. Dr Trudeau's Sanatorium is organized on this plan.

Here is one of our American Sanatoriums. The objection I have to most of these easy chairs is that they do not have the proper shape for the back, but of course a little cushion can be slipped in there. These ordinary chairs have a tendency to produce congestion of the liver, but by raising the chest the liver will have a far better chance and congestion will be avoided. Here are the patients at the Adirondack Sanatorium, each patient in his folding chair and his feet in another chair so they can be well bundled up and kept warm with hot ~~xxxxxxxxxxxx~~ bricks or hot packs if necessary.

These are what are known as shacks. Here is a street car that-- at least it looks as though it was an old street car--has been set up here and is being occupied as a shack, and here are some ~~α~~ more shacks that were made. For \$100.00 or \$150.00 or less than that, a structure can be put up that can be occupied in winter and with great comfort. Here is the appearance of the settlement of Professor Loomis, a plain simple building, nothing ornate about it, cheap as it possibly can be, but open so that there is an abundant opportunity for the circulation of fresh air. The sleeping quarters you see look very crude, but the idea is to expose the patient constantly to the fresh air; but you say, "the air in my house is pure." But that is not it: it is not fresh air after all, that is not the whole thing; that does only a small part of it. What is it then? It is cold air and it is more important to have the benefit of this cold air at night than in day time, at least quite as important.

This is the Nordrach Ranch, near ^{Colorado} ~~Colorado~~ Springs. I have known many people to go there and enter upon this outdoor life who seemed to have very little chance of living, and get them afterwards in good health. And this is the camp of the Young Men's Christian Association near Denver, which was set

in successful operation by my Friend, Mr. W. M. Dana. Here is the water tower and the administration building, and the cottages in which men who have contracted this disease are given an opportunity to live and make a successful battle for their lives. This is Davos Platz, one of the most famous of all the world's resorts for twenty years. The whole town now is made up of sanatoriums or boarding houses; the whole place is filled with people suffering from tuberculosis and probably the safest place to go because of the fact that everyone is instructed how to avoid disseminating the disease. Nobody spits on the street or sidewalk: everyone has a sputum cup or bottle, so there is no danger from that source. Here is one of the settlements; also Davos is the center of a great number of settlements-- thirty or forty perhaps. This is an outdoor park where in the summertime the people go about with very meager clothing to harden and toughen the body, to toughen the skin; to improve the body in every way; to make the body as near like that of the savage as possible. Some of you remember perhaps that during the first peace conference held at the Hague there was objection made to the use of dum-dum bullets. The representatives of England objected to the prohibition of the use of dum-dum bullets because the Englishman said, "We have to fight savages and you cannot kill savages with ordinary bullets." Why? There was one case in which a savage was making a charge upon the officer and there were half a dozen soldiers who leveled their rifles at him and put six bullets through his body, but he kept right on with his charge just the same and they didn't stop him until he had cut off the officer's head. It takes dum-dum bullets to stop savages. Why? Because the savage has got such tremendous power of resistance, such tremendous vigor, and that is exactly the kind of vigor and vim that the ordinary man needs to stop tubercular germs. The thing can be done; the body can be built up and

fortified, and the success of these hundreds of sanatoria in different parts of the world, their success in the mastery of this disease is proof that the body has power to successfully combat it. The most important thing is to build the body up before you get the disease. Keep the body tubercle bacilli proof; keep it in that condition, and you need not have the disease. This is one of the splendid sanatoria in Great Britain which has recently been erected for the treatment of these patients. This is an outdoor sleeping gallery in Germany. Here is Davos Platz again, a view from the other side of the valley. Snow is always to be seen upon the mountains around this valley. This is the sanatorium I was telling you about at Rutland, Mass., that I visited a few years ago. This sanatorium accommodates several hundred patients. Here is the main building at Falkenstein, one of the old European institutions that has acquired a world wide reputation for the treatment of this disease. Here is another European sanatorium. These are private sanatoria. Here is another private institution which has been erected in the United States. Here is the sanatorium at the south end of the Isle of Wight. Some of you have visited this place--a very interesting place indeed: one of the oldest sanatoria. Here is another view of Davos in winter time. This a view in one of the forests connected with one of these very interesting places.

Here is one of the chairs which are very commonly used for sitting upon porches, but they do not have the right kind of a back. I have tried to get the manufacturers to change the shape, but it is very hard to get them to change the shape of those things that have become conventional.

But here are some flowers which do not have tuberculosis. They do have some diseases, but they do not ~~xxxx~~ suffer from tuberculosis: tuberculosis is a disease of animals, largely of human beings, and we are subject to it

largely because we have departed from right habits of life. ~~Exherkaxax~~
 If a flower is not properly taken care of it becomes diseased, and human beings become pale and cease to bloom like flowers only because they have departed from the right course of life. Let us all resolve this minute to go out from this place as missionaries of the gospel of health. Let us help to check this ~~plague~~ awful plague--the greatest plague of humanity--by spreading abroad the gospel of health; by telling the people how to get well; how to get away from wrong habits of life; how to cultivate right habits; how to improve the body to make it vigorous and keep it vigorous by living out of doors. Let us tell the people how to fix their sleeping rooms and their homes so as to provide for the outdoor living; and by this means we may accomplish ^{more} ~~xxxxxxx~~ toward the extermination of this awful plague than can be accomplished by the spending of any amount of money.

One of the members of the congress in a speech said the thing needed is money, because it is found the poor man is twice as likely to have tuberculosis as the rich man; it is his poverty that makes him subject to this disease, so what the poor man needs is money. It is no use to talk to him about having plenty of good food, plenty of good beefsteak, etc.; it is no use to talk to him about that unless you give him the money to ~~xxxxxxx~~ buy the beefsteak. But it looks to me like it was knowledge and not money that is needed. If the poor man had the money without the knowledge he would waste it; throw it away. If he had the knowledge without the money, he would learn to better expend the little money he has in such a way as to cultivate health instead of disease.

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HOW THE BODY DEFENDS ITSELF AGAINST DISEASE.

Stereoptican Lecture at the Sanitarium Parlor, Battle Creek, Mich.,

Thursday, October 15, 1908, at 8:00 P.M.

by J. H. Kellogg, M.D.

The question of the greatest possible interest to people who are sick and to people who are well is how to develop immunity: how to become immune. Now that we can become immune against disease is proven by a good many things. It is not a new idea by any means: it is not ~~new~~ new in the medical profession; ~~it is not new~~ it is not new to people outside of the medical profession. We can read in books several hundred years old how to cure the rickets by being dipped in cold water. John Wesley, for example, in his interesting book, "Primitive Physic" says to cure and prevent the rickets the child should be dipped in cold water and new dipped every morning, and continue this practice about a year and the child would be cured of rickets and would not get it any more. That is a good remedy because when a child has rickets it is generally intestinal autointoxication that produces it: it is intestinal infection which interferes with nutrition, and the poisons circulated through the body cause loss of appetite and prevent assimilation. The effect of cold water is to increase the flow of gastric juice; to increase the number of blood cells; to increase the assimilative processes of the body and so antagonize this disease of degeneration. I think Brown-Sequard one of the most eminent physicians who has lived in Modern times, who was half American and half French--his father was French and his mother American -- so he spent part of the time in this country, but the greater part of his life was spent in France in Paris. I had the pleasure of spending some time with him in his laboratory some twenty years ago, and Dr. Brown-Sequard who is one of the men who contributed perhaps almost more than any other to

the advancement of physiologic knowledge in certain lines, used to treat his patients in a way which seemed doubtless very queer to them. A man would come into the office for example and say, "Doctor, I have a sore throat: whenever I venture out of doors or expose myself the least bit I get a sore throat."

What do you think the doctor would do to this man? He would have him sit down in a chair and with a little sponge or wet towel he moistened the back of his neck and then he set his servant at work blowing air on to the back of his neck with a pair of bellows. He would keep that up for half a minute. The next day the patient would come back and the same treatment would be repeated for a minute, and the next day for a couple of minutes and so he would go on increasing it day by day, increasing the length of the application and moistening the neck and blowing cold air upon it until he would do it half an hour, and when he was able to bear it for half an hour that was proof, don't you see, that he could not catch cold by anybody opening a window for two or three minutes; a little breath of air upon the back of his neck would not make him sneeze any more ~~and~~ ^{for} he was able to stand the bellows for half an hour. That man was immune then against sore throat because the back of his neck had been trained and so ~~he~~ had become able to take care of itself. Now that is the source of all the ~~is~~ trouble that comes from so called taking cold. The cold, by the way, is not a cold at all: it is a heat instead of a cold: the ordinary cold is certainly a misnomer. One does not take cold but takes a heat: he gets a fever and he does not catch a cold at all, but the cold catches him, so the whole thing is wrong end foremost. Now as I said the whole difficulty is that the skin lacks resistance. You see a wild Indian ~~animal~~ in the forest or on the plains: he does not take cold; doesn't know anything about a cold. I remember very well when I was a boy I asked my mother who cautioned me that I must be very careful to put on my rubbers when I went out in damp weather: I must be so careful not to get my feet

wet in running around in soft snow and water. I said to my mother, "Why doesn't the cow take cold? they don't wear anything on their feet at all; why should I take cold when they don't? Other creatures run about without taking cold, why shouldn't I?" I didn't understand the philosophy of it, and there is no good reason why I should take cold by getting my feet wet any more than there is why a cow or a horse or a dog should do so; it is not natural that we should do it. The feet are perfectly able to take care of themselves. Why does one take cold anyway? Simply because the temperature of the blood is lowered; either the general temperature or the local temperature of the blood is lowered. Now you know if a man has headache and we put cold water on his head and keep putting on a cold cloth for several hours or for several days if it is a chronic thing, frequently he will begin to complain, "Doctor, my forehead is sore and is painful and I have neuralgic pains in my forehead; the skin is sore; my flesh is sore." Very often when a patient has a weak heart we put an ice bag over the heart, and after the ice bag has been put over the heart half an hour two or three times a day for two or three weeks that patient generally begins to complain of soreness in that region, "Doctor, I have pain in my chest: what is the trouble?" Now it is a local rheumatism, called rheumatism for lack of a better term. It properly is not rheumatism but simply a painful sensitive condition but not akin to what is ordinarily called rheumatism: it is simply due to the lowering of the blood temperature in that region due to the removing of the waste matters in these tissues, so the waste matters have accumulated in these tissues and the nerves and other tissues have become abnormally sensitive and that is the reason for that pain. It is only an indication of what happens to the skin when the skin has not the power of resistance. But here is a lumberman away up in the north woods. He has got a raft of logs to run down the river a couple of hundred miles. He is on the logs part of the time and in the water part of the time. His feet and legs are wet perhaps all day long. When night comes

he lies down on the bank with his wet clothes on--perhaps his clothing is not dry ~~enough~~ for three weeks. He doesn't take cold. I have talked many times with lumbermen, in fact have had men here as patients even who have told me their experiences. I remember one once said to me, "I wouldn't take cold all the time on the drive, but when I got to camp and went into camp I caught a cold in less than 48 hours. I caught a cold right away." Now the reason why, as I said, for taking cold--an ordinary cold--is from the temperature of the blood being lowered either locally or generally. Now if a person has been perspiring, we will say, or has been walking and is sweating, and sits down somewhere and lets the wind blow on him by and by he ~~just~~ begins to feel chilly. What is the trouble? When he was exercising he was making heat all the while, his muscles were generating heat. A muscle is like a dynamo. A dynamo generates electricity. A muscle generates heat just as a dynamo generates electricity. By the action of his muscle heat is generated just as by the revolution of the armature of the dynamo electricity is generated, and in a similar way. The muscle generates heat, not in the way a stove generates heat, but in the way ~~as~~ in which a dynamo generates ~~heat~~ electricity, although there is combustion going on. Now if a person perspires when he exercises the reason is that he generates more heat than is needed to keep the body warm, so it is necessary that the body should be cooled off and perspiration is simply the ~~an~~ effort of the body to cool off. Bathing the skin with water so as to produce evaporation is the cooling off of the skin. This is the reason why a person has perspiration. Now suppose he sits down, the generation of heat ceases. It is like putting out a fire or blowing out a light. The operation of heat generation, this extra generation of heat, ceases, so the evaporation going on without any heat being produced and the evaporation still continuing because the skin is wet and the clothing contains ^{in it} the moisture for sometime causes a chilling of the body. Now suppose a person was not

wearing clothing and the temperature was reduced and pretty soon there comes a chill and then comes a shiver, and what is that? simply an effort of nature to warm the body up. It is an involuntary exercise, involuntary gymnastics. You have been walking, running, leaping, skipping, working, and that has produced excessive heat which is being carried off. Now the evaporation comes on after the heat generation ceases so the body is cooled, the temperature is reduced down below the normal and there is a general lowering of blood temperature which occurs quite rapidly. It only takes a few minutes to produce this result, then in order to produce more to warm the body up the muscles are set into spasmodic contraction and there is shivering and sneezing which is a kind of general spasm. When one sneezes he does not sneeze with his nose. The nose is not the thing that sneezes at all. It is the whole body that is exercising. If you sit in a chair and sneeze there is a little jump everywhere. Every muscle contracts. Your ^{feet} lift up from the floor. There is a jump of the whole body from the floor up. It would be quite impossible to hold anything steady in your hand when you sneeze, but the motion is particularly of the expiratory muscles. There is a sudden contraction of the expiratory muscles with an explosive effort through the mouth and through the nose. Now this is simply an effort of nature to warm the body up. When you sneeze you say, "Oh! I am taking cold." That is a mistake. You have taken cold and that is the first step nature takes to ~~and~~ cure the cold, and when you begin shiver ~~and~~ you say, "I am taking cold, I am shivering." You have already taken cold. Your temperature has been lowered and you already have cold and that is the effort of nature to cure it. Now if you want to help nature the best way is to keep right on shivering. You feel a little shiver started here and you begin to feel chilly. All right, now shiver just as hard as you can. That is the quickest way to stop that shivering. I have had that experience myself repeatedly. I work quite vigorously ~~and~~ sometimes and not infrequently find myself in profuse perspiration and ~~and~~ then some patient will

catch me and want to tell me about his case. I cannot make any excuse to go off and leave him so I have to stand right there and listen to him and by and by I find a chill creeping about me and find myself chilling, and I ~~work~~ work about the patient just as hard as I can and in that way get warmed up and do not catch cold. Sometimes I get so interested in the work that I forget it and then I get a bad cold, but certainly one can prevent himself taking cold entirely. Suppose one is sitting in church and there is a little draft blowing on the back of your neck, you say, "Why, I am going to get a cold. I shall have a stiff neck tomorrow sure." You don't need to have. All you need to do is to make your neck stiff. Make the muscles contract just as hard as possible and keep the muscles working so they will keep the skin warm so you won't take cold. If one is exercising he doesn't take cold but you can sit perfectly still and work as hard as you ever worked in your life. You can sit perfectly still in a chair and work so hard as to make yourself perspire freely by making every muscle of your body tense. The hands can be perfectly straight at the side and the muscles may be perfectly rigid. Make ~~of~~ every muscle of the body rigid and you will see pretty soon that you are breathing hard. Pretty soon you are taking deep breaths. You may say that it is hard to do that, but one can sit right in the church and look the pastor right in the face with perfect steadiness and ~~work~~ work as hard as though he were sprinting or running to catch a train and the person sitting right next to you would not know anything about it, so one does not need to take cold because he is sitting still, because one does not need to sit still. He can sit but work, if you like. He can sit still and run if he likes. He can rest himself by doing all kinds of hard work although sitting perfectly still and getting all the benefit he can possibly get from exercise right there. I have often tried that experiment and found it is very good. If you find the wind blowing on the back of your neck when you

are sitting in church you don't need to be afraid at all. Just simply sit right there. Set these muscles in the back of the neck at work, but don't make them work the wrong way, for then the pastor will think you don't agree with what he says, but make the muscles work the right way. You can do it just as well and the pastor will think you are comprehending all he is saying and that you are appreciating ~~it~~ it don't you see, so he will be encouraged and you will both be benefitted. Now this is simply a matter of developing the natural powers of resistance. The body does not lie down and give up when disease assails it. The body fights ~~fast~~ and it never gives up. Disease is never manifested in the body until the body has been overcome, until the natural forces of the body have been overcome. Now it is a very interesting thing to see what wonderful provisions nature has made for protecting us against disease. Here is this wonderful skin, tough and impenetrable in the state of health, absolutely impenetrable to germs, the great enemies of life, ^{these} ~~the~~ bacteria as they are called, a most wonderful collection. The skin is not simply a ~~simple~~ membrane, simply a dead ~~case~~ in which the body is inclosed, but it is a live membrane. It is a barricade of living beings that are fighting for us, that are defending themselves. There are many millions in the skin, millions upon millions of little living cells that are watching for the germs that come. These little cells, some of them build skin and some of them fight germs. The skin is continually covered with germs. This is true of the skin of every animal, covered completely over with multitudes of germs. Within 24 hours after the death of an animal these germs have spread all through ~~the~~ it so the germs that are found ordinarily upon the skin are found everywhere in the entire body within 24 hours after the death of the animal or the death of the human being. The entire body is filled with these skin germs, which set up putrefaction and various changes in the body. This is where

these putrefactive processes come from. That is how they begin. In life these cells of the body are fighting these germs off and the germs can only get in a little ways. Once in awhile one gets away down deep under the skin^s escapes from its colony. Then what happens? Then you have a boil. That is what a boil is. That is why men have boils on the back of their neck and ladies do not, because their stiff ugly collars rub the neck, chafe it and rub the germs in. A lady has a boil on the end of her nose. I don't know as I can tell just why that is, but I might imagine various theories about it, but the germs get down beneath the skin and they grow there. If the resistance is sufficient they cannot live there and whenever you see a person who has boils or pimples upon his skin or the face or shoulders or who is suffering from skin disease of any sort it is an indication of lowered vital resistance so that these germs which naturally belong upon the surface of the body have been able to penetrate a little ways and go down beneath the surface, grow and develop there among the living cells. That shows lowered vital resistance so when a boy comes along with pimples on his face that means something to the doctor. The doctor who is wide awake can make a diagnosis right away in the case of a boy who has pimples. If that boy opens his ^umouth and puts out his tongue we shall find it a coated tongue and if we make a bacteriological examination of the fecal discharges we shall find an enormous number of bacteria there because this is the product of this condition. That is the most common cause, almost the unvarying cause ~~cause~~ of this condition of the skin. It is an unhealthy state of the skin, and the boy's breath is bad. We find that boy suffering from intestinal autointoxication probably. He is eating too much beefsteak, bolting his breakfast and dinner so he can get off to see the ball game and he is not taking time enough to fletcherize, to masticate his food. The skin is the first wall, if you please, of resistance,

particularly outside. We have a lining skin which is still more wonderful in its work in protecting the body against disease--the mucous membrane from the mouth all the way through the whole thirty feet of the alimentary canal and down through the lungs, over the whole 2,000 square feet of pulmonary surface. Think of it my friends, over 2,000 square feet of lungs. If the lining membrane ~~of the lungs~~ were stripped out of a pair of lungs and spread out it would cover the entire floor of this room, so you see what an enormous surface there is, and this surface is covered all over with these life protectors, layer upon layer of living cells which have for their purpose to find out the germs which we are taking in with the air which we breathe. And the 7 square feet of membrane which lines the interior of the body--the lining skin it is called; the alimentary canal-- if it were spread out it would cover a surface of seven square feet. This seven square feet is all covered over with these wonderful life protectors, living germs which are ~~fighting~~ fighting the germs of disease. It is like a citadel surrounded with a dozen rows of sentinels. If they get through the outer row here is a second row. If they get through that here is another ^{line} ~~line~~ so there are many lines, not only a dozen or two but hundreds of them one after another, so the germs have to run the gauntlet of 100 or more of these lines of life preservers. Now the mucous membrane has something more to do than to fight off these germs. It has something more to do than that. For instance here in the mouth is the saliva. The saliva is not a germicide exactly, but germs cannot grow in healthy saliva. Real healthy saliva always contains germs, but the germs cannot grow there. That is the reason why a healthy man, a man whose blood is healthy and whose saliva is healthy, being made from healthy blood, does not have a coated tongue. His tongue is clean because the saliva will not permit germs to grow, but when this man's blood becomes destroyed the saliva becomes deteriorated, so then the germs will grow, and when he goes to bed at night with his tongue pretty clean he wakes

up in the morning with his tongue looking as though it needed the city scavenger after it, and he has a horrible taste in his mouth, a slimy cottony loathsome taste, and he has a bad breath. Why is that? Simply because the saliva permits the germs to grow. Now you know what the canners of fruit and vegetables sometimes do. They put a little benzoic or silicious acid or something of that kind into the fruit. They do not have to take so much trouble then in the canning because the preservative that they put in will keep the germs from growing. They do not have to put in ^e enough to kill the germs but only enough to keep the germs from growing, for germs are really a very sensitive kind of plant, but they won't grow if the soil is tainted the least bit. It would take a much more powerful dose to actually kill them but it takes only a very small dose ~~extra~~ of germicidal substance to prevent their growing. It takes, for example, a very high temperature to cook corn, to actually kill corn, but when the corn is growing, when the corn is in the form of seed corn, ordinary dry seed corn, it takes a very high temperature to kill it, but if that corn has sprouted, if it has begin to sprout then it only takes a little heat to destroy it. For instance a very hot sun might kill the corn after it is sprouted, whereas it would take a very high temperature to kill it before it has sprouted. So when germs are growing it takes only a very small amount of some germicidal substance to prevent their growth, while it takes a very large amount of the substance or a very ^{high} ~~high~~ temperature to kill the germs that are already there. A few drops of cinnamon oil will act as a preservative, but ~~it~~ it will take much more to kill all the germs present. A comparatively small amount prevents the growth of the germs. When we get to the stomach we find in the gastric juice a powerful germicide. It not only ~~it~~ prevents germs from growing, but it actually kills germs, dissolves the germs, actually digests the germs so that they are destroyed, killed and really obliterated, so when one eats food which contains germs

and the stomach is ~~not~~ in a healthy state he need not feel very much scared. A man who has hyperacidity, for example, has an excess of gastric juice, can drink typhoid fever water or cholera water or any other kind of infected water and it won't do him any harm, provided his stomach has food in it and has gastric juice in it. You know there is a very old supposition among the laity, and I think it is well founded, that a person will not likely take disease on a full stomach; that a person is much more likely to contract disease on an empty stomach; that is, if the stomach is empty he is more likely to take disease than if the stomach is well filled or if he had ~~had~~ eaten food, and that is perfectly true. The reason why is, if the stomach is empty there is no gastric juice there and if he swallows some germs they take hold there and grow because there is nothing to disinfect them, but if he has eaten something, if he has taken food, then there is gastric juice there digesting the food and the germs that are taken will be destroyed right along with the digestion of the food. Men who can digest fried mushrooms can digest typhoid fever, cholera or any other kind of disease germs. About half of all the chronic ~~is~~ invalids have too little acid and some of them none at all. About half of them have hyperpepsia. People who have no acid at all or ~~are~~ too little acid are liable to take typhoid fever or cholera or anything else of that sort because the resistance is low. Now we get further down below the intestine and there is a wonderful thing there. The intestine pours out a large quantity of mucus which is protective. This mucus is good food for germs and at the same time it is protective. It prevents the ^{growth} ~~growing~~ of germs. It prevents germs from coming in contact with the mucous membrane and so prevents them from getting into the blood vessels and invading the body. When a person suffers from mucus discharges from the bowels it is evidence that the body is fighting germs. It is not the mucus

that does the harm. The mucus is evidence that the body is making a battle and the mucus is the smoke of the battle. That is the evidence that there is being a battle fought and the evidence that a protective effort is being made so it is not the mucus itself that we want to get rid of. It is germs that give occasion for the mucus we want to get rid of. ~~xx~~ When we ~~make~~ make an examination and find a person has a great number of putrefactive germs, a great number of anaerobes, that is evidence of the condition which gives rise to the mucus or to intestinal autointoxication. Now there is another interesting ^{thing} that you can find in the intestine. The mucous membrane is a filter and the poisons formed by these germs, that are produced by the germs growing there, are filtered through this intestine, or the matters absorbed are filtered through it and the poisons are excluded, but by and by ~~xxxxx~~ it is possible that the membrane may break down. There may be raw surfaces there, and then the poisons can get through and avoid this process of filtration. After the germs have been absorbed into the intestine from the blood they are carried to the liver. It is the duty of the liver to filter out these germs. There are three lines of resistance to poisons. There is first the mucous membrane of the intestine. There are three means of resistance to intestinal poisoning. The mucous membrane of the intestine is first, the liver comes next and then the kidneys and the thyroid gland and the suprarenal capsules come next. Now let us see what they do. The intestinal mucous membrane filters the poison out. When these germs come in contact with the liver the liver destroys the poisons. For instance, the indol which is found in the intestine when it reaches the liver is converted into indican. Indol is a powerful poison, but indican is a non-poisonous substance, so the indican that is found in the urine of a person suffering from autointoxication is not a poisonous substance but it is an indication that poisons have been produced, of which this is the remains after having been acted upon in the

liver. Next we find the thyroid gland and the suprarenal capsules of the kidneys. The thyroid gland produces a substance which causes the suprarenal capsules to form an antitoxic substance which burns up the poisonous matters. Here is the stomach. This is the mucous membrane that pours out the gastric juice. This slide shows the effects of alcohol on the stomach. This is the congested stomach of a person who takes alcohol or of a person who takes mustard, pepper, pepper sauce and ~~ginger~~ ginger, for they all produce the same condition. This is the stomach which is subject to gastric catarrh produced by alcohol, mustard, pepper or condiments of any sort or by excessive flesh eating. This is the stomach of delirium tremens, a stomach almost in a gangrenous condition. The pancreas makes a digestive fluid which is also more or less protective. The pancreatic juice is poured out into the duodenum at this point. Here is also the spleen which is also a protective organ. It destroys toxins and also destroys germs. Here is a view of the sympathetic ~~nervous system~~ nervous system. You see it is like fine fibres that run in all directions over the body. They follow the blood vessels especially and get about the stomach, spleen and intestines. These have control over all the mucous processes. This shows you what a vast number of blood vessels ~~are~~ there are so you see how easily these poisons can be absorbed from the intestines and carried away by these great venous trunks and carried up to the liver. Both germ poisons and germs themselves are circulated in this way through the liver. Here is a healthy liver and here is a liver that has been overcome by these poisons. Here is nutmeg liver and various other forms of disease of the liver. Here is atrophic cirrhosis of the liver. Here is a hobnail liver with lumps on it. Here is cancer of the liver. Here is a fatty liver, a condition in which the liver has almost the ~~same~~ color and appearance of butter. All these conditions of the liver are the result of intestinal autointoxication. These conditions were formerly supposed to be

the direct effect of the use of alcohol. Gin liver was thought to be produced by alcohol but it is now known that this is not the case. This hobnail liver or gin liver is not due to alcohol alone but it is due to intestinal autointoxication. Alcohol destroys the stomach and destroys the defensive power of the intestines and then this condition of the liver results naturally. I have seen many and many cases of enlarged, diseased, inflamed, degenerated, fatty, cirrhotic livers, great numbers of them, and nearly all the cases I have seen have been cases in which the patients were not addicted to the use of liquor but were suffering from intestinal autointoxication. Some years ago we encountered an enormous liver that weighed some 28-1/2 pounds, whereas the normal weight of a liver is 3-1/2 pounds. It was eight times as large as it ought to be. The patient had never used alcohol or tobacco in his life--he was a temperate man. This result was entirely the result of excessive autointoxication, not excessive meat eating, so this man got a bad liver without being a drunkard. In fact it is generally due to intoxication but it is not alcoholic intoxication. It is that very much worse, more subtle and deadly intoxication known as autointoxication. I met a gentleman today and surprised him very much ~~which~~ when I told him he was intoxicated. He looked very much surprised and astonished when I said that. He said, "Why, you have been intoxicated a long time and you are intoxicated most of the time." He looked very much perplexed. He had not been addicted to the use of liquor he said, but when I explained to him that it was autointoxication and he made the poisons himself, generated them in his own body, and his liver was constantly under the influence of these poisons and his whole body was under their influence he understood it better.

This is the suprarenal capsule I was telling you about. It is one of the most wonderful structures in all the body. It is only recently that its function has been discovered. It is now known that this suprarenal capsule

manufactures a substance which, when it circulates through the blood, has a power to destroy the poisons which are in the blood which have been absorbed from the intestine. But in order that the suprarenal capsule shall make these substances it is necessary that the thyreoid gland should do its duty. The thyreoid gland produces a substance which circulating in the blood comes in contact with the suprarenal capsules and stimulates them to make their toxin which is this antitoxic substance known as adrenalin. Suppose a person has ~~as~~ a large quantity of poisons absorbed from the intestines, has a large amount of decomposing matter which is converted into poisons which are absorbed into the blood, the result will be that the thyreoid gland will be stimulated so it will grow and become too large. We have a lady here in the house at this time who came here some months ago, and she had an enormous thyreoid gland. Her eyes were protruding from their sockets, her pulse was 140 and she was ~~in~~ in a very feeble condition from exophthalmic goiter. I knew right away what the difficulty was, that it was ~~in~~ intestinal autointoxication, so we put her upon an antitoxic diet, but her condition was so critical I thought it best to remove a part of this gland, so I removed the thyreoid gland on one side. In three weeks she seemed like another woman. She thought it was not necessary to remain and went home, but unfortunately she returned somewhat to the old mode of life and it was not very long before the same symptoms returned again. She came back again a few weeks ago in such a bad condition the doctors said she was not in a condition to have an operation done, but she returned to the antitoxic diet and now her condition is so much improved we think it will not be necessary to do the operation. We cannot remove the whole of the thyreoid gland because the thyreoid gland and the suprarenal capsules work together. The thyreoid gland produces a substance which stimulates

the suprarenal capsule to make a substance which destroys the poisons, but if the thyreoid gland is entirely removed the adrenals would fail. The suprarenal capsules would not do their work and the poisons would be allowed to do great damage in the body, so this suprarenal capsule is an exceedingly interesting little structure. We could not live without it, but when one's body is continually saturated with these poisons the suprarenal capsules are overworked. The thyreoid gland is overworked and that results sometimes in degeneration of the thyreoid. The thyreoid sometimes undergoes degeneration and shrivels up. The suprarenal capsules undergo similar changes. They become hardened, indurated, undergo degeneration and when a person gets into this condition then he suffers from what is known as Addison's Disease, in which the skin becomes sallow and the patient has all the appearances of the most pronounced intestinal autointoxication. Now we did not know what was the real cause of Addison's Disease until recently, but now we know the cause and we know what to do for these cases. We must avoid autointoxication. That is the only thing that will do any good at all in Addison's Disease. A lady who had been treated for Addison's Disease for sometime and whose skin was really very much the color of leather--a sister of one of the leading doctors of Iowa--after a few weeks treatment here went back home with her skin as fair as anybody you ever saw. The skin became as clear and white and fair as anybody could wish to have it simply as the result of being here upon a non-flesh diet, upon what we call an antitoxic diet, a diet which could not generate poisons, a diet which would antagonize the production of poison. This is a matter of tremendous interest.

The greatest advance which has been made in modern times in the treatment of chronic disease is the discovery of this cause of autointoxication. The causative relation of these poisons absorbed from the intestine to functional and organic diseases of various sorts. The eminent Prof. Bouchard

was the originator of the term auto-intoxication. He wrote a book upon the subject and he pointed out a great many facts which have previously been unknown to the profession and there was a good deal of ridicule, as there is of every new doctrine that comes forward. It has to fight its way against opposition and there is no profession in the world in which precedent has so much sway or force as in the medical profession unless it be possibly in the legal profession. Everything is precedent pretty nearly in the medical profession; still prevailing opinions are very hard to battle against. It is only with the proof of overwhelming evidence that it is possible to overthrow old dominant notions.

Here is the kidney, one of the structures by which the poisons are strained out. This portion is the part devoted to the making of poisons out of the blood and they are sent down through these little tubes into the central portion of the kidney and thence off down through the ureter into the bladder. When the poisons are present in large quantities the constant concentration of poisons in the kidney results in setting up disease of the kidney so that the suprarenal capsule becomes worn out, overloaded, and by and by undergoes degeneration and the kidney itself undergoes degeneration because of the great quantity of poisons which are being strained out through it. The kidneys are a filter you see and the filter gets clogged up.

Here is a picture of the larynx and right about here the thyroid is located. Removal of the thyroid is a very delicate operation because of the proximity of great blood vessels and large nerves. This is a picture of the kidney structure, the reddish structure I have called your attention to, where the secreting cells are found. When magnified under the microscope it has the appearance which you see here. Here are blood vessels and here are the little capsules, a most wonderful arrangement. Here is an artery

and here is a vein. The arteries are twice as large as the veins in this part of the body, the very reverse of the condition in other parts of the body. The veins ordinarily have ^{twice} the capacity of the arteries but in this case the arteries have twice the capacity of the veins, a wonderful arrangement which permits the formation of the urinary secretion. The arteries are so large and the blood brought down here is so great in volume that the small veins are not able to carry it off, so the serum of the blood is strained out, runs out through this convoluted tube and passes along this tube and comes in contact with cells which bring out from the blood urea and other poisons which are washed away in the serum.

Here is where the thyroid is located on either side. In all these branching tubes are to be found cells which fight off these germs. Here are some cells that have captured some germs already. You can find great numbers of them. Here is the place where the thyroid is located. The thyroid that is growing downward is the most dangerous kind of thyroid because it gets down by and by away down under the chest. I have been obliged sometimes to go two inches down under the sternum, under the chest cavity, to pull out the thyroid. These cases are very hard to deal with so it is better that these cases be operated on at an earlier stage.

Here we have a picture of the blood--the white cells and the red ones. Here is the heart which circulates the blood and which does the fighting--which aids the fighting of the body by sending around blood cells which do the work, and here is a picture of the white blood cells which do this wonderful work of combating germs. Here are some germ fighters, the little ones here. The large ones are the scavengers. These large ones consume debris but the small ones fight the living organisms. Such ^{cells} ~~gases~~ as these fight the germs which assail the body, pick them up and actually digest them, so when a person is under the influence of a germ disease it is found

that these cells rapidly multiply. A lady came in today and wanted me to perform an operation on her. I found she had a large formation upon the side, probably an abscess, but I did not perform the operation upon her until I first made an examination of the blood, so she is coming tomorrow to have her blood examined and in the meantime we are studying her blood carefully. We are studying the blood to see if we can find out what kind of germs these are and then we want to know whether or not she has enough of these germ fighters in the blood to make an operation successful or not. If I had performed an operation upon her when these germ fighters are not in sufficient quantity, when there were not enough of them to make a successful fight we would have trouble immediately and might perhaps lose the patient.

When a person gets appendicitis or pneumonia or any of the germ diseases as a rule these germ fighters or microphags rapidly increase in number, and that is what is known as leukocytosis. They increase in numbers so rapidly that they double in a few hours time. For instance if there are 7000 in a millimeter, a little quantity of blood as big as the head of a pin, if there are 7000, in three or four hours there will be 14000 and in three or four hours more there will be 20000 or 30000, and in the course of 24 hours the number may get up to 100,000. Every little drop of blood in the entire body has that increased number of these germ fighters. They have been increased in this great quantity for the purpose of fighting off these invading organisms which are the real cause of pneumonia. Here you see the process in operation. Here is the blood. Here is the blood stream passing along the vessel. Here are these white cells I was telling you about working their way through the ^{vein} cell wall so that they get out among the germs and pursue them, and the wonderful thing is that the cell does not have to hunt around to find the germ. Here is the germ out here in the tissues somewhere. This cell comes along, comes out through the wall of the blood vessel and goes right

straight for that germ. It doesn't go hunting around and feeling along for it but it goes straight toward it and never makes a mistake, although it has no eyes it goes with the directness of a creature that has eyes. It hasn't any nose with which to smell but somehow it knows where that germ is and goes straight to it and catches it each time provided there are enough of these cells. If there are enough of these white cells, the microphags, to cope with the germs which have assailed the body the victory is on the side of the body. If there are not enough cells, if the body has lost its power to make white cells sufficiently rapidly to keep up with ^{the} number of germs then the germs get the victory and the patient dies, so you see how important it is that we should have these forces present in sufficient number and sufficiently active to make a successful battle. That is the whole thing.

When a man is sick it is because his vital resistance has failed at some point. Perhaps his liver has failed or his kidneys have failed or maybe his blood has failed. That is where the failure most often is, so that his body is not able to make a successful battle. That is why you come here with headache. When you have headache it is because poisons have accumulated in your body and the liver was not able to do the work required of it and the kidneys were not able to eliminate poisons fast enough. The liver was not able to destroy poisons as fast as they were being generated so they accumulated in the blood and by and by affect the nerves and you have an attack of sick headache or neuralgia, or in some cases there may be a convulsion, an epileptic attack or a fit of depression or it may be a fit of melancholia or a fit of anger perhaps, a fit of irritability you could not resist, an attack of depression which you could not resist or it may be sleeplessness. Perhaps your brain becomes stupefied so that you cannot think properly, so that you could not do your ordinary work, you could not concentrate your mind. All of these things grow out of autointoxication and these are only a few of the things that grow out of it. Bad breath,

tainted skin, bad complexion, pimples on the skin, eruptions on the skin, enlargement of the joints and ~~xxx~~ rheumatism are other things that come from this cause.

Here is something I am sure will interest you very much and will help to give you an idea of the reality of this thing. You have wondered sometimes what makes the hair turn gray. Why does one lose his power to think and to reason in old age? The brain often retains its integrity even after other portions of the body have become degenerated so that they are very much inferior to their former ability, but the brain after a while suffers in this way. You very often find an old person who has lost his memory entirely. What is the matter? I called your attention to some large cells in the blood. These cells consume other things besides germs. They consume dead bits or particles found in the body. When the body becomes deteriorated by wrong habits, when poisons accumulate in the blood to such a degree that the body cells are deteriorated then these macrophags, which are the scavengers of the body, whose duty it is to consume dead particles and carry them off seize upon the living cells, the deteriorated living cells as though they were dead cells, seize upon them and destroy them and consume them just as though they were rubbish that needed to be removed. Here you see that very thing going on. Here are some of these macrophags attacking the brain cell of an old woman who died when she was 100 years old. These were found all through her brain. These macrophags were attacking her brain cells and eating them up. This is copied from Dr. Metchnikoff's book. He found the same thing in the brains of old dogs and of other ^{old} animals. This shows how the same macrophags destroy the kidneys. When the kidney has to carry off a great deal of poisonous matters the result is absorption from the colon of poisonous substances from undigested fragments of meat, products of putrefaction of undigested fragments of meat, hams, eggs, etc, that are fried and

rendered indigestible. When these poisons are swarming into the blood in such quantities that the kidneys have been overwhelmed with these poisons then the kidneys become deteriorated to such a degree that these macrophags attack the kidneys themselves and that is Bright's Disease. When the kidneys become worn out, tired out, overpowered by the poisons filtered through them--indol, skatol and other poisons absorbed from the colon which result from long wrong diet, they are the most common cause of Bright's Disease. They prepare the kidney so that the kidney is assailed by the macrophags and this degeneration of the kidney or Bright's Disease is the result.

This is what Metchnikoff himself saw under the microscope and this is the picture he made of it and published in his book several years ago. Prof. Metchnikoff has also shown us why the hair turns gray. The hair is a little tube which contains a great deal of coloring matter and is black. Other hair contains only a little coloring matter and is lighter. Now this shows how these macrophags run up into the hair. This is the hair as you see it under the microscope and here are little particles of coloring matter which give it its color. Here are these little macrophags running up into the hair and each one of these macrophags sends out its arms and steals out the coloring matter. Here are some specks of coloring matter that have already been gathered in, and when a cell ^{gets} ~~these~~ itself full of coloring matter it escapes and goes back into the body and carries the coloring matter with it so it becomes a robber you see. They come on just like burglars who break into the house and steal things out of the safe. They carry off the coloring matter of the hair so when you find the hair getting gray it is because the macrophags are swarming into it and stealing the coloring matter. Then you know these macrophags are getting after you. They may be stealing your brain cells next and carrying them off or they may be attacking your liver or

kidneys next or destroying some other vital center of the body, so one certainly ought to take great care that he does not encourage the macrophags. He needs to discourage the macrophags. How can he discourage the macrophags and encourage the microphags? I will tell you next time about that, how to increase resistance. I am telling you tonight how the body defends itself against disease. Next time I will tell you how to discourage these macrophags and how to build the body up so we will be able to combat these enemies of life and health which are all about.

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HIGH LIFE

Stereoptican Lecture at the Sanitarium Parlor, Battle Creek,

Mich., Thursday, November 12, 1908.

By J. H. Kellogg, M.D.

Ladies & Gentlemen-- I will talk to you tonight about the High Life. Sometime ago a doctor in Chicago sent a lady here for treatment and he sent a letter along with her and he said in the letter, "Doctor, I am sending this lady to you because she is suffering from too much high living. I am sending her up with the idea that your plain diet will help her." I wonder if the doctor thought we lived low up here. This lady had been living too high and he thought she ought to live down a little lower. I told her that we lived high, that we lived on the top shelf; that we had our dining room on the 6th floor and got just as high up as we could in our living.

We had a gentleman here not long ago and he said to me, "Doctor, I want to tell you just what I came here for. I came here to learn how to live. I am satisfied I have not been living right. I think I have been living too high and I came here to learn how to live properly."

A prominent railroad man of Chicago wrote me sometime ago that he was just getting over an attack of the grippe, his stomach had been out of order for a year and he said, "Doctor, I am coming over to Battle Creek to get the habit of living right."

A young man brought his wife here sometime ago. They had only been married about three months. They came into the office and when I went in he arose in a very tragic way and he said, "Doctor you see what is the matter with my wife." "Well" I said, "What is it" "You can see, doctor, look at her! look at her!!" "Well," I said, "She doesn't look very well, that is a fact."

She was poor, emaciated and sallow. He said, "Doctor, my wife is a product of modern civilization." So I proceeded to investigate this product of modern civilization and found it was certainly a bundle of rubbish. The poor woman certainly was about as nearly wrecked as a human being could be and still be going about and it was wrong diet, wrong living, and wrong habits of life that were responsible for it.

When we take a square look at the fact that the whole civilized portion of the human race is degenerating at a frightful rate it ought to cause us to pause and consider what is the cause. One cannot visit London or any other of the old world cities without being tremendously impressed with the great number of degenerated people he meets on the streets. In East London, for example, you could hardly see anyone else going along. I have many times visited East London and stood on the corner to see the people passing by, and I found I could hardly see one good wholesome looking specimen of the genus homo. It is surprising indeed how almost universally the marks of degeneration are to be seen. The British Government has awakened to the fact that there is something going wrong. They appointed a commission not very long ago to investigate the matter of degeneration of the English People and they found sure enough that there was a most tremendous and a most terrific degenerative process going on. They investigated the public schools. They found in one high class girls' school 34 young women out of 36 had crooked backs, deformed spines--34 out of 36. They found among the children of the public schools that there were nine tenths of them more or less deformed, had some difficulty of the eye, misshapen ears or some other difficulty.

In almost every civilized country marks of degeneration, these stigmata of degeneration are to be seen everywhere. In this country it is indicated by the enormous increase of insanity. 50 years ago there were

only 600 insane people in the million and now there are 1800 insane people to the million, and in England there are 3,000 insane people to the million. Now that means something my friends. There are more than 500, 540 to be exact, idiots and imbeciles to the million. We are losing our senses pretty fast aren't we? At the present time there are 1600 idiots and lunatics to the million, that is, 1800 and 1600 you see make 3400, which is more than one third of ten thousand. At the same rate in 50 years more we will have 10,000 idiots and lunatics to the million. That would be 1%. In 50 years more it would be 3%. In 50 years more it would be 9%. In another 50 years 27%, and 50 years more 81% and 50 years more it would be 243%, but we could not go so far as that. We would have to stop before we got to that. So within 265 years from the present time we will all be idiots and imbeciles if we do not stop. If something doesn't happen to us before we get there, at the present rate we are going--this is not a fancy my friends, it is an actual fact, we are becoming insane at a terrific rate. Last year I was talking to the Secretary of the Illinois State Board of charities, Prof. Graves, talking this very thing over with him. "Yes" he said, "It is terrible. Why, we have down in Illinois 10,000 lunatics in the insane asylums, and I have recently been collecting statistics, making compilations and computations to see if I could ascertain how many there were outside of the insane asylums and to my astonishment I found there were more than 50,000 outside and we have only got 10,000 inside: havn't caught the rest yet, but they are there and I wouldn't be surprised if they would find 100,000 when they get the whole truth of it." What is true of Illinois is still more true of Michigan, Connecticut, Rhode Island and other eastern states where the degenerative process has been going on a greater length of time. The older the country the more degenerate the people. Out west in Kansas, Nebraska and other western states you will find that the people are taller than they are in New York, a good deal taller than

they are in Michigan. We have noticed that for a good many years. Nurses coming from the west, from Kansas and Nebraska and other western states are always taller than people who come from the east, considerably taller and larger. The people of the west have a more outdoor life than the people of the east. The people of the east ~~live~~ live in cities mostly. More than half the population of some of our eastern states are to be found in the towns. Go out west and it is not so. There are no very large cities there. The people are living in the country or in small country towns so they have more fresh air and less of the city habits which are the great source of this degenerative process. There seems to be somehow the idea that what is called the high life is enjoyable and that the higher you go up the more fun you will have. Now that is perfectly true if you only have the right conception of what high life is, but it is not true concerning the popular idea concerning high life.

When I was in Mexico some years ago, passing along one of the main streets in Mexico City I noticed a sign across the road which struck me at once and impressed me very much because the words were in English. The sign said, "High Life Restaurant", and I looked in and the only thing I could see was a whole lot of cigars, champagne bottles, whiskey bottles, etc., and I began to understand what high life meant. I went down the street a little further and I found a high life tailor, so I found the words, "High Life" down there in that country meant something similar to what they supposed high living people in New York did. Over in Hungary, in Budapest, Hungary, some years ago, I noticed the same thing, "High Life Tailor Shop", "High Life Restaurant" "High Life Millinery" etc. There seems to be an idea generally extant among the people that the fast living, the artificial living, the so called high life, is the most enjoyable sort of life, but no delusion could possibly be greater. A good many people who come here to this institution have

confessed their disillusionment and have said very frankly that they were awfully mistaken in supposing that they were really having a good time. Now what had they been doing? They had been sitting down at the table just to have a good time, sitting down to the table just for the fun of it. I have known people to sit down and eat a good supper and then four hours later go to a picnic somewhere and eat four times as much as they ought to think of eating, and what for? Simply because it had a good flavor and tickled their palate.

Some years ago I had a call from the Governor of Michigan, a former Governor--Governor Bagley, a large tobacco manufacturer of Detroit. He was just coming back from Chicago where he had been to attend a great picnic. Some years ago you remember when General Grant came back from his trip around the world he went to Chicago and ^{they} had a great picnic for him, and Governor Bagley went to that picnic and he said they sat at the table for five long hours eating and drinking and gourmandizing. The Governor was suffering from gout, as he ought to be from such habits as that, and by the time he got to Battle Creek he couldn't stand it any longer so he got off the train and came up here to see if we could do something for him. The Governor said, "I want you to tell me if you can what ~~you~~ I can do to get rid of this gout. I never go anywhere but I take along some calchium pills, so you don't need to prescribe them. They used to keep it off, but they don't work any more. Now tell me, if you can, what will cure the gout." "All right," I said, "I can cure you. I can tell you what to do" The Governor said, "Now look here Doctor, I don't want any fooling or experimenting about this. The last time I got a prescription for gout I went to Dr. Farrand, in Detroit, and ~~xxxx~~ I said to him, "Now Doctor I want ~~you~~ to give me something for my gout" and the Doctor said, "All right". He wrote a prescription for me,

He passed it over to me and I passed out the door and down the street, but I didn't get more than a few rods when I heard the Doctor shout out to me, 'Governor! Governor! come back' I went back and said, 'What do you want Doctor' He said, 'If that does any good let me know for I have got it myself.'" He said he threw the prescription in the street. "Now Doctor", he said, "I don't want any experimenting. I want to pay you for giving me some good solemn advice, something you know is good for the gout." "All right" I said and I told him first of all to stop smoking. That would hardly do for a manufacturer of cigars who had a large cigar factory in Detroit. It wouldn't do for him to stop smoking cigars. "Well," he said, "I will have to think about that." "Next thing stop your beefsteak." "Well" he said, "I couldn't live without beefsteak." "Well" I said, "Governor, I am afraid I can't do very much for you. Come up sometime, stop a few weeks with us and let us show you how to live. A man doesn't have gout unless he eats it. You never have gout unless you eat it. The gout is ^{not} something which slips in slyly while you are asleep, that steals in insiduously, but you have to sit down to the table deliberately and eat it and swallow it to get it, otherwise you will not have it at all." He said, "Is that so?" "Yes, that is so" I said, "It is true, for gout is simply toxemia, a disease of poisoning, and the man who has gout has simply poisoned himself by eating food that creates gout, and beefsteak is the thing that does ~~it~~ it more than anything else." "Well" he said, "I will have to think about that. Can't you give me something for temporary relief?" I said, "Oh, yes, we can give you an electric light bath if you say so. You can go in and have an electric light bath and a shampoo and massage and you will feel a little better, but gout is a thing that will not be compromised with. It has got a grip upon you and it will keep its hold upon you until it kills you if you don't stop cultivating gout." But the

Governor thought he would have to wait until a more convenient season. He went home and it wasn't more than a year or two before I picked up the paper one morning and read that Governor Bagley was dead. I knew what he died of. He didn't die of a respectable disease. He died of a disgraceful disease. He died of gout and nobody has a right to die of gout. Gout is a disease that anybody ought to be ashamed of because it means that he has been a low liver, not a high liver but a low liver, that he has been giving up his life to having a good time with his palate; that he has been having fun, if you please, with his palate, playing upon his palate and upon his sense of taste just as one would play upon a piano, a fiddle or a jew's-harp just to get music out of it, to get pleasure out of it, but by and by the time comes when the discords become dismal and the music has long ceased to play. Now the average man sits down to the table, eats everything that comes along asking no questions for conscience's sake or stomach's sake, asking only questions for palate's sake. Is it good? Does it have a good taste? Do I like it? Do I have a good time while I am eating it? These are the questions he asks. ~~Nx~~ Now when a man sits down to the table and eats everything that comes along, that is, everything that is found upon the ordinary conventional bill of fare, if he could realize what he is doing, if he could only see standing up there around those dishes--if his imagination could only picture in the steam that is rising from some of these savory dishes the real things that are there, the veritable demons of disease that are there, he would be so horrified that he would flee. He would flee!

I was walking along the street in London a few years ago and I saw a sign out that amazed me very much, astonished me and surprised me. The sign read, "Second Hand Teeth" and I could hardly believe my eyes at first, so I took the second look and sure enough there it was, "Second Hand Teeth". I said, "This is something peculiar. I never encountered anything like this

before." I went back a third time to look and to make sure I was in my right mind and had not had a delusion, and there it was plain enough, "Second Hand Teeth". I soliloquized as I went along, "How would one enjoy eating a dinner with second hand teeth?" He would be meditating now and then wouldn't he, "What were these teeth eating the last time before I got them? Did they chew tobacco? Did they eat Limburger cheese? What were these teeth eating?" Well, you know it struck me as being a most uncanny kind of thing for a person to be trying to eat dinner with second hand teeth and not the least bit enjoyable, and then when I got to the hotel and sat down to dinner and looked over the bill of fare the first thing I found on it was calves' brains, and the man who sat next to me ordered some. I looked at him and decided he needed some. As I thought it over it occurred to me that after all those second hand teeth were not so bad because they could be washed and made clean but here is a man eating second hand brains and I looked down the bill of fare and there were a whole lot of things second hand. There was second hand liver, second ^{hand} stomach--tripe you know they call it to cover up the real fact. In fact a large part of that bill of fare was second hand. Beefsteak is nothing but second hand muscle. Pretty much of the food on that bill of fare was second hand. An ox somewhere had eaten corn, splendid, sweet, beautiful corn which came down from the hand of the giver, true, proper animal food that was made to be eaten by animals. An ox ate it and that ox died. A man came along chopped him up, distributed him around and people were eating that corn second ~~lx~~ hand you see. A hog ate some corn, ~~rolled~~ rolled it around in the mud for six months or so, then he died and was chopped up in the same ~~waxy~~ way and was distributed about and people ate that corn in the form of a pig, or spare ribs or sausage or hams, sugar cured hams, etc. Now we do not stop to think what we are doing. We have gotten so far away from natural methods in our eating, drinking and all our habits of life that we think it is

perfectly proper to eat these hideous things--really positively horrible and hideous when you stop to think of it.

There was Plutarch, that wonderful old philosopher who wrote an essay against flesh eating and those disgraceful atrocities of the butcher shop, slaughter pens and cook room. He made some very queer remarks about "Those layers out of corpses--the butchers and the cooks." "Why", he said, "Sitting down to such a meal as those people prepare one would feel as the old poet said, 'The very hides begin to creep.'" We find upon the ordinary bill of fare a dozen or more sometimes listed. Sometimes more than a dozen, two or three dozen sometimes, of different kinds of animals--a veritable menagerie of dead beasts, and one is expected to make a selection from these dead things.

Some of you think it is very improper for me to be making remarks of this sort because you have been brought up to eat these things, but I was speaking with a little boy at one of the tables in the dining room the other day. He was sitting at the table all alone. He said he was a little late and I said to him, "Sonny, are you having a good time and enjoying your dinner?" He looked up with a twinkle in his eye and said, "Say, I want some chicken." "Well" I said, "Do you like chicken?" "Yes" he said, "I am very fond of chicken: I like chicken very much." "Look here" I said, "Suppose there was a mother hen here somewhere on the table and a lot of little chicks peeping around looking for their mother, would you want to eat a piece of that dead mother hen?" "I wouldn't like to have them see me," he said. The little fellow saw the impropriety of the thing right away when he stopped to think of the mother hen don't you know. He never thought of that before. He only thought of it as chicken. It never occurred to him that that chicken was alive or that there was any life lost so to speak in the death of that chicken but when I presented it to him in that light he at once began to feel ashamed don't you see. He didn't want to have them see him doing it. He might have

been tempted to eat some chicken but he wouldn't like to be caught at it
 you see. That reminds me of a story a ~~xxxx~~ minister told upon himself up in
 He was going to a house up in the country one day where he had often gone
 before and you know the minister often has chicken when he goes about in
 the country that way. He said he was climbing up a hill and he saw a little
 girl and two or three younger children running after the chickens with all
 their might and saying to them, "Shoo! shoo! shoo!" and he listened to them
 and finally heard the older one crying out, "Shoo! shoo! run for your lives.
 Here comes the man who ate your father." He said he felt very much ashamed
 of himself to think of the murders that had been committed in his behalf.
 Now I am perhaps dwelling too long upon this one particular point, but we are
 in a very great number of ways destroying our lives by our daily habits.

It is not entirely what we eat, but somewhat in the way we sit.
 I was looking around a moment ago taking a note of the people to see how many
 were sitting straight. I am glad to see you straightening up and I will look
 the other way for a moment to give you a chance to sit up straight and I
 think I observed that about three fourths of the people in this audience
 were sitting collapsed, sitting with their chest collapsed. I was talking
 to a man the other day about that and this is the way he sat down in the
 chair (illustrating). It is a very common thing for a person to be sitting down
 in this sort of way, just sitting down in his chair completely collapsed.
 I could not at first succeed in getting him to understand how he ought to sit.
 Finally he said, "I see doctor, I see. I have been in the habit of sitting on
 my back, and that is just it. He had been sitting on his back. If you examine
 the anatomy you will find that nature has provided two prominent surfaces for
 the purpose of supporting the body in sitting. I am not sure but that is a
 mistake because as a matter of fact I don't think that nature ever intended
 that we should sit. I have a sort of theory--I have not explored it so I am
 not able to speak absolutely about it:--I am not ~~absolutely~~ absolutely

certain whether it is right or not--that we were never intended to use chairs at all but that we were intended either to walk about erect or to lie down--recline. If you have noticed primitive people you will see that they are always walking, standing or else reclining, lying down full length, reclining upon an elbow but never sitting. Now the danger of sitting is that we get ourselves under the influence of that awful force, gravitation. Gravitation you know is like sin. It is always pulling us down. It is always dragging us down. It is tugging away at the liver and the stomach and all of these other organs that hang loosely in the body, pulling them down, and the only thing that keeps gravitation from getting our livers clean down into our abdomens is because the muscles contract and hold them up and the muscles of the abdominal walls contract and hold them up. If these muscles are not properly contract but are relaxed gravitation pulls them away down.

I examined a man today and found he had cancer of the stomach, and I had good reason to believe that the way he got cancer of the stomach was this very thing, sitting relaxed so that the stomach was prolapsed, fallen down so that it became a cess-pool and accumulated a lot of poisonous material and retained it until the body got so poisoned that cancer germs could get a foothold. He has got a cancer and he cannot possibly live but a very short time because the disease has got such a hold. This is only one of the ^{ways} ~~ways~~ in which we are going wrong. Let me just say another word about sitting. When one sits in the ordinary chair it is absolutely necessary that he should sit properly. You cannot sit in an ordinary chair and sit relaxed without getting into trouble, ~~xixixix~~ without suffering injury. In the ordinary chair which has a perfectly straight back, to get any support from this chair you can only touch the upper part of your shoulders. If you undertake to support the whole back, to support the center of the back,

you have to do it at the expense of malposition. You have to relax your muscles because ~~when~~ the back has got a bow in it, and this natural ~~position~~ bow is necessary for the proper position of the body. The moment we allow the bow to disappear, allow the back to become straight, that moment the sternum is brought down two inches below where it belongs and then all these abdominal muscles are consequently relaxed.

Sometime ago I heard a Del Sarte ~~talker~~ ^{teacher} say here in the parlor, "When you sit down don't sit so stiffly. Relax when you sit down," and she sat down and she relaxed beautifully. She was all right when she relaxed because the muscles of her back were so short and so strong that she could not possibly relax into a harmful position, but this is not true of the average man or the average woman. If one relaxes he immediately falls into a state of desuetude I think we ought to say, certainly into an abnormal position. Just see the difference. When I am relaxed in this chair just see the position. I gave her a little lecture afterwards. I said, "I don't believe in your doctrine. It won't do to teach such a doctrine as that to the people because these people relax too much anyway. We must teach people to sit forcibly. For example now just see what ~~is~~ happens to me when I relax. When I sit up forcibly you see I look different." "Doctor" she said, "You know ~~xxxxxxxx~~ I never noticed until just then that you were a small man. I always thought you were a large man when I saw you sitting up there, but I didn't notice until you relaxed that way that you are small." So you see it is an especially good thing for small people to practice sitting forcibly. You know when a cat comes into the room ^{it} ~~and~~ puts its back up and makes itself just as tall as it can, and so small people who want to look large should not relax, should not sit relaxed but should stand up as tall as they can and sit as tall as they can. If they will do that everything will be perfectly right.

I think I shall never forget a young lady who came into my office

one day and said, "Doctor, my mother sent me to you about my lungs." I said, "What is the matter with your lungs? Do you have a cough?" "Oh, no, I don't have a cough." "Well, what is the trouble?" She said, "Doctor, when I sit in the chair don't you see I havn't any chest." And sure enough she looked as though she didn't have any chest. I said, "Now look here. Stand up like me. She said, "My mother ~~xx~~ thinks I am going to have consumption because I havn't any chest." I told her to stand up and she stood up and sure enough there wasn't very much chest. I put her through a few exercises, made her bend over, throw back her head, lift up her chest, stand on tiptoe then down on her heels and there she was and she had a splendid chest. The trouble was you see she had been going about carrying her chest behind instead of in front. That was all the trouble. Now you can see any number of people go about in that way dragging the chest along behind and perhaps carrying the hips in front. They have got the thing entirely reversed. This sitting in an improper attitude in a relaxed attitude is one of the most prevalent traits of civilized people. When we are sitting in this way gravitation gets hold of the stomach, liver and other organs and drags them down out of place. A prolapsed colon becomes the hold of hateful, putrefying, fermenting--a veritable factory of poisons, a cesspool of hateful death dealing poisons. I cannot find words that are any too strong to express the facts in relation to that thing. I am satisfied that the evils that come from this particular source are among the greatest of the evils that civilized man has to battle with--the great cause of old age, ~~xxxxxx~~ premature death, chronic disease, of lowered vital resistance, even consumption, is to be found in this chronic autointoxication that is almost universal among civilized people.

I had a letter today from one of the greatest surgeons in the United States, a man whose name everybody knows, a man in New York City, and this is what he wrote me. He said, "Doctor, a very dear old friend of mine who has

very pronounced opinions of his own, not a medical man but a scientific man and a man who knows, however, something about medicine: he has some very decided opinions about certain things and particularly about diet, and he believes that meat is an unwholesome article of food that should not be eaten. He does not eat meat and he believes that flesh eating is one of the causes of cancer and he suggested to me that I should write to you and ask you what your observations have been with reference to that, with reference to the susceptibility of people who are not meat eaters to cancer." Now I was very glad to have an opportunity to write him the facts about that; that I have been watching for forty years for a person who had been for years a non-flesh eater or a flesh abstainer who had cancer and that I have not found a single case but I have met a great many cases of cancer and operated upon a great many cases in the last thirty-five years and I have not found a single case in which a person who has been for a number of years a non-flesh eater who had a true cancer and I have very seldom found tumors in such cases, and I was very glad to tell him that not only my own experience confirmed this idea and that I agreed with his dear old friend, but that Dr. Senn in traveling down the coast of Africa observed the same thing. He found that cancer was almost entirely unknown and not only cancer but appendicitis as well among the natives of the eastern coast of Africa among the primitive people there. These are a great many illustrations of that thing with reference to appendicitis. Appendicitis always comes to meat eaters. There is never a case, or rarely ever a case, occurs in a person who is not a meat eater. In Algeria, for example, the Arab soldiers rarely ever suffer from appendicitis whereas the French soldiers are extremely subject to it. This fact was published not very long ago by the Surgeon General of the French Army.

In France the Government is wise enough to treat its prisoners as the keepers of the zoological gardens treat their bears in Germany.

The keepers of the bear pens in Germany found many years ago that when they fed meat to their bears they became wild, ferocious and uncontrollable, so they don't allow their bears to have any meat and in France the Government of France is taking its cue perhaps from this incident, possibly from some other thing, I don't know, and discarded flesh food from the prison dietary and the consequence is that a man's life is a great deal safer in the prisons of France than out of them. He has a much better chance for a long life. His life is much better and he doesn't have appendicitis, but right in the cities about the prisons where appendicitis is quite rife--they don't have ^{any} among the prisoners. The only cases that have occurred in the last ten years among prisoners were cases that occurred in prisoners who were just received, just recently brought in. Here is another interesting fact. Applying this very same ~~fact~~ principle of recognizing the influence of flesh eating upon character they have prohibited its use in their insane asylums, so in the insane asylums of France the patients are fed no meat. That is a very interesting thing. A great number of insane people shut in the insane asylums of France and all vegetarians and appendicitis is unknown among them. And there is something more. There are some voluntary vegetarians in France as well. There are the Sisters of St. Joseph and the Trappist Monks and certain other orders of the Catholic Church that discard meat from their dietary, and they are absolutely free from appendicitis. In these institutions they have no record of any case ever having occurred. Some years ago I wrote to two Catholic establishments in Kentucky, and they abstain entirely you know from flesh eating, and I asked the prior to write me something of their habits, etc. and I asked this man, "Of what do your inmates die?" He replied that they all died of one disease--old age, and I was very glad that he said disease, for old age is a disease.

I was reading the other day, going through the government reports,

and I found the government recognized old age as a disease; that old age was put down among the other diseases of which people die, and you know one fact in which I was particularly interested, because I ^{have} had some ideas upon the subject for a good many years, was that death from old age is increasing. The mortality from old age is increasing. A larger proportion of people are dying of old age, a larger number of people to the million. Now what does that mean? The first question that I asked myself was, "What does that mean?" Is it that we are getting more old people? Is that the reason for the number of people reported as dying from old age increasing? That means that senility is coming at an earlier age. I thought it meant that but of course did not have the exact proof of it, but the other day I got the proof of it. I received a report the other day from the government statistician who obtained his proof from absolutely authentic sources. He obtained it from the offices of the large insurance companies in the east. The life insurance companies publish what they call tables of life expectancy, that is, a man at fifty years of age probably has about so many years to live. A man of thirty has probably so many years to live and a man of 40 has probably so many years to live. Now the thing which was so tremendously interesting was this: that after 60 years of age the life expectancy is less today than it was 20 years ago. That the man 60 years old today has not as good a chance to live as many years as the man of 60 years of age had 20 years ago. Now what does that mean. That means exactly the same thing as the other report that old age is increasing; that people die before they ought to die. Metchnikoff has told us what that disease is. He has told us it is a colon disease, caused by poisons absorbed from the colon, poisons produced by putrefactive germs, the same germs that cause ~~cause~~ the putrefactive process in a dead animal, The very same germs that give the bad odor and the obnoxious properties to a dead rat dying under the floor. These very same germs abound in every piece of

beefsteak you find at the butcher shop or in every piece of fish, whether smoked fish, fresh fish or dried fish or pickled fish. You find it in them all. You find it in every sort of fish except canned fish. I have to admit that they are not found in canned fish. Fish are canned at such a high temperature that the germs are killed. Ordinary cooking does not ~~destroy~~ destroy the germs. In fish, beefsteak and particularly in sausage these germs are swarming and of course when that flesh is eaten these germs go right along with it into the body and there they take up their abode and grow and increase in numbers. It is stated that at least 300 trillions of germs are produced in the human body every day, that is, of the average man, the meat eater. 300 trillions is quite a number isn't it? That is 3,000 times as much as a billion. 300 trillions is 3,000 billions. That is the number of germs that are produced in the human body every 24 hours. We have ~~maxix~~ found cases here in which we have made estimates and found the number to be up into the trillions. I imagine 300 trillions is pretty large but it may be anywhere from 30 trillions to 300 trillions and these germs are producing poison, all of them and these poisons are absorbed into the body, circulated in the blood and destroy the arteries, harden the arteries. When you are sitting in a cramped position with the chest doubled over and collapsed the upper part of the lungs cannot make any movement at all. The lower part of the lungs can be utilized because the diaphragm here moves up and down and forces the air in and out of the lower part of the lungs, but when one sits in such a position his chest is cramped, and the upper part of the lungs do not expand at all so the upper part of the lungs are not used at all, and that is the reason why so many people have tuberculosis in the upper part of the lungs. A patient comes to the doctor with a cough and says, "Oh Doctor, I am afraid there is something the matter with my lungs." And the doctor always begins his examination at the top

because the chances are ten to one that he will find the trouble in the top part of the lungs, and you see a good reason why women should be more susceptible to tuberculosis than men, because they fasten up the lower part of the chest so it cannot expand and there they are making a faint effort to breathe with the upper part of the chest by lifting up the shoulders and tugging away to get the ribs up a little bit so there is a little chance for the ribs to expand. Some ladies spend so much of their time in crocheting, embroidering and sitting in a cramped position that the upper part of the lungs get very little exercise. It is only now and then when they are singing or walking that the upper part of the lungs get a chance to expand properly, so here is one of the great causes of tuberculosis of the lungs. Now dust, you know, when it is inhaled ~~into~~ goes down into the lower part of the lung. One would naturally think it would gravitate downward instead of upward but here is the place where dust begins to get into the lungs because the lower part of the lung is kept more actively alive, more vigorous and more resistant. The rocking chair is unquestionably a comfortable means of suicide.

I remember one rocking chair which had a very unsavory history. About 25 years ago I visited a very rich family in Switzerland on my first trip abroad. This doctor had a rocking chair and ~~he~~ he said, "This is a very interesting chair." He said, "You know I bought this chair in London for there are no rocking chairs in Switzerland or Germany!" and on the continent of Europe you rarely ever find a rocking chair. It is an invention of the devil I think. I should say the doctor said he bought the chair in a second hand store in London. The man who kept the second hand store said he had bought it of an American clergyman who had died of consumption in London. This doctor took the rocking chair over to Switzerland and I found them happy. The next time I went over there I found them unhappy. He had a cough: he

had consumption, and I found a lady there taking care of him. The next time I went over there the doctor had died of consumption and the lady had been sitting in the rocking chair. She had a cough. She had tuberculosis and she died. Her sister went over to take care of her during the last few months and she sat in the rocking chair at intervals, got a cough, got tuberculosis and she died. There was a niece who was also assisting in taking care of the doctor and she suffer the very same fate. There were six or seven people who sat in that rocking chair and all died of tuberculosis. A great many more die from sitting in rocking chairs in the United States, rocking chairs are so numerous, but really the fault is not in the rocking chair after all. It is in the shape of the rocking chair. Not in the chair itself at all. The rocking chair generally has a ~~solid~~^{hollow} back, the idea being that when one sits down he wants to relax in the rocking chair so he has a sort of tendency to curl down in it and that cramps the lungs and prevents their expansion and so predisposes to pulmonary disease.

Now it is possible to have a wholesome rocking chair, a perfectly healthy rocking chair, but the chair to be healthy must have the back made in such a way as to support the hollow of the back, especially in the lower part so that it will be impossible for the chest to get down, and such a chair is a great deal more comfortable. The majority of our chairs in the Sanitarium are made with a little curve in the back. The rocking chairs that you see here most of them are made in this way, although there are a few heathenish chairs here still, but we have ordered them reformed. Here is a chair that needed reformation, so it has a cushion fastened on to the back of it. This little cushion makes a little bump at the right place and it happened to have a wide seat so this ^{by} cushion reformed it and made it a very decent chair in this way. So when you go home reform your chairs and reform your own habit of sitting. Sit up straight just now for a moment to see what it feels like.

Get the chest clear up, take a good deep breath and hold your chest up and everything will go all right. ~~Then~~

This gives you an idea of what happens ^{when} ~~with~~ tubercle germs are taken into the lungs. They go down through these little tubes and run into these little pockets. Every one of these is a little cell or group of cells and there are many many millions of them: they are not ^{as} large as you see here by any means. They are extremely minute. There are so many of them that if the lining membrane of the lungs were spread out over a broad surface it would cover 2,000 square feet, and it is almost incredible. Here are the lungs of a frog. Here are the lungs of a fish. You never heard of frogs dying of consumption. They may be inoculated with it but they do not catch it. They breathe but they do not breathe enough for individuals constructed like human beings, but there are many human beings who breathe like frogs. You notice a frog that has been down in the mud ~~kokax~~ comes up to the surface occasionally and just before it comes to the surface you notice a few bubbles come up in the water. That is an indication that the frog is emptying his air bag. When he gets to the top he sticks his nose out of the water and begins to swallow. He hasn't any breast bone so he cannot expand his lungs. All he can do is to expand his throat so he sucks air into his throat and pushes it down, and there is a little valve in the back of his throat which enables him to push it into his air bag and fill it up. When he gets his air bag full he goes down into the mud and stays there half an hour. His bag of air will last him half an hour or perhaps all day, if it is a cold day, or perhaps all winter. When the water is frozen up he gets along all winter. Why? Because he does not lead a very active life. Here is a ~~XX~~ bird with lungs so large that they fill a large part of the body, an enormous chest that takes up a large part of the trunk, and its lungs are supplemented by passages which go clear down into the bones so it is always true of the

bird that it breathes to the very tips of its toes. The bones are hollow and these hollow spaces are connected with the lungs and used as enormous breathing surfaces. This bird flies with the speed of a railroad train or an express train. It remains upon the wing hours and hours sometimes flying with tremendous velocity, sometimes as though it were shot out of a gun, a very different creature from a frog. It can soar. Now the frog lives down in a stagnant pool. It croakes. It lives in green slime, water with all sorts of scum over it. The bird lives above the clouds in the sunshine and fresh air and knows the sweetness of the morning skies, but the frog croakes. If you are going to breathe like a frog, ~~xxxxxxxxxxxxxxxx~~ you are very likely to croak like a frog. If you want to sing and soar you must breathe right. You must breathe like a bird.

Now here is the heart. I haven't time to talk very much about the heart^{*} but just one word. The heart is the engine of the body and the life depends upon the heart more of course directly than upon any other organ of the body. The heart is a muscle like other muscles. Think of a business man sitting down in his office chair and not taking any exercise. When he goes out of his office he gets into an automobile, a cab or a car, goes home and eats something steps back into his automobile, cab or tram car, goes back to his office again, never takes any exercise, never uses his muscles, so his muscles get soft and flabby, almost like mush. Now that man by and by will find a train that he wants to catch just start^{ing} and he runs for the train but just before he gets to the cars he drops dead upon the pavement from heart failure according to newspaper reports. What was the trouble? It wasn't running to catch the train that caused the heart failure. That wasn't it. The heart is strong enough to do that and a great deal more than that, but the degeneration of that heart resulted from smoking tobacco and perhaps beer drinking and partly the sedentary life in his office. All these things put together

and his wrong eating, gourmandizing, have all reacted upon his heart. These little arteries feed the heart. When a person's blood is filled with poisons, the result of auto-intoxication, these poisons circulate through these arteries permeating the tissues down to the very final terminal net work of these tissues which are all saturated with the poisons. The arteries themselves become clogged up and after awhile this little network disappears or part of it at least, so there is only now and then one, so the blood cannot get into the tissues to feed them. It is like the irrigating ~~ditches~~ ^{ditches} becoming clogged so the water cannot get to the land to water it. A chalky deposit is formed in the arteries and they become brittle. This is first made into fat but this is so extremely brittle that the arteries are very likely to break so nature changes this fat to lime or stone so as to give the arteries more strength so that the individual may live a little longer. When the arteries become obstructed in this way the heart has to work very hard to get the blood over these obstructions. Then the blood pressure rises because the arteries are hard and when your blood pressure goes up to 200 or 210, or 180, it means there is something the matter with your arteries. The arteries have been poisoned somewhere. When this poisoning process goes on for a long time every part of the body becomes saturated with the poisons, resistance is lowered and this part of the body is particularly likely to suffer.. The stomach has to take the hardest knocks of all. The skin, the cutaneous covering of the body, is not treated anything like so badly as the stomach is. I remember 32 years ago this very fall a young lady came here, was brought from Grand Rapids, and she said, "OH, I can't stand this diet."

"Why? What is the matter?"

"It hasn't any taste to it," she said. The muscles work the other way so I can't swallow it. The muscles work up instead of down. It won't go down."

I said, "What would you like?"

"Well" she said, "I would like some bread and butter, with the bread very thin and the butter very thick and then some mustard on top of it."

That is what she had been accustomed to and that was the only thing she could taste. After she had been here for several days and I wouldn't give her any she was still pleading for some mustard, pepper sauce or something she could taste. I went in one morning and said, "I am going to give you some mustard."

And she said, "That will be so nice of you doctor. I knew you would be kind to me."

I sent up for some mustard. I said, "What do you do with it? You have it in your stomach don't you? I have ordered a mustard plaster put on your stomach."

"Oh Doctor" she said, "My doctor at home ordered mustard plasters and I wouldn't have them and that is why I came here."

I said "Oh, I don't see why you should object to them. You are perfectly ⁱⁿwill to have a mustard plaster on the inside but not on the outside of your stomach. How is that? I don't understand it at all."

After I talked with her for a while she decided she did not want it either inside or outside. I have seen any number of people spreading on their butter at the dinner table a quantity of mustard or putting on their food a quantity of pepper sauce that would make a great big blister on the outside of the stomach. Things that burn and blister and sting as they go down were never intended to go into our bodies or come in contact with them. See this congested stomach, the blood vessels ~~extending~~ standing out looking like an eye that is protruding with inflammation.

Dr. Beaumont, who had an opportunity to observe that interesting trapper Alexis St. Martin who had an accident by which the front part of his body was torn away by the unexpected going off of a gun loaded with duck

shot and carried away a space as large as your hand on the front side of the body including a large part of the stomach, so the doctor could look in and see his lungs, see his heart beating, and see the inside of his stomach. Well he thought he was as good as dead, but he would not die. He insisted on living. When he got well a great portion of the wall had sloughed out and the edges of the opening in the stomach were joined to the edges of the opening in the skin so there was a big window in his stomach, and when he had his breakfast in the morning he had to take great care to see that it didn't escape. He had to have a ~~little napkin~~ napkin bound down over this opening in order to keep his breakfast from getting away. This man was a good subject for study and Dr. Beaumont used to give him things to eat and he would peep in and see what happened. Among other things he gave him mustard, pepper, pepper sauce, ginger and such things, and he looked in to see what occurred and he could see every sort of thing that happened there, and these things irritated his stomach and caused it to become inflamed, and when he took alcohol the same thing happened. Alcohol, ginger, mustard, pepper, pepper sauce, everything of that sort produced a blistered condition of the stomach.

I met a gentleman today who said, "Doctor, I don't think my stomach is doing its duty." I said to myself, "I never heard of a stomach or saw a stomach that didn't do its duty." He repeated it to me several times. I think he expected I would sympathize with him somewhat because of his refractory, negligent or dilatory stomach, but I didn't. I knew very well his stomach was not at all at fault. And it is not only the stomach that suffers but other organs as well. Here is a healthy liver. Here is what is called nutmeg liver. Here is a cirrhotic liver, which has nodules projected out around it. Here is a hobnail liver which looks like the sole of a French cobbler's shoe.

Now here is the fact that I want to call your attention to--the fact that Prof. Boix, of Paris, has been making experiments with dogs, ^{and} guinea pigs

and he discovered that pepper has six times the power to produce gin liver ~~as~~ gin has; that pepper has six times the power to produce gin liver that gin has; that gin doesn't produce gin liver directly but only by spoiling the stomach, destroying the digestion, disturbing the digestive apparatus, then this condition is the result of indigestion.

Here is a cancerous liver, a fatty liver, an inflamed liver. These are all the result of that thing--lowered vital resistance, less power to fight against the causes of disease, the enemies of life. One of the important body defenders we have is the kidney, and this shows you very well how the kidney does its work.. Here is the artery that brings down blood to the kidney with the poisons in it, and you notice the arteries are larger than the ~~xxxxx~~ veins. This is the only place in all the body where the arteries are larger than the veins. It is a wonderful arrangement. The very reverse is true of the rest of the body. We have ~~ix~~ twice as much vein capacity as artery capacity, but here in the kidney it is the opposite. ~~Theyxxxxxxx~~ The arteries are twice as large as the veins, have twice the capacity. The reason for that is so that pressure may be greater in the arteries and the result of that pressure is that the serum of the blood, which has the poisons in it, is forced out into this tube, this crooked, wonderful, convoluted, marvelously rolled up and tucked in in all sorts of ways, and what you see here does not give you any impression at all of the marvelous convolutions that this tube goes through, and the serum passes down ~~the~~ through this very crooked tube, travels a long distance until by and by it reaches the central portion of the kidney and passes along down to the bladder. Now here is a very interesting thing. That serum has some things in it which are good, that old serum of the blood, but there are poisons in it. Along down this tube there are wonderful living cells living workers that select out of the serum ~~ix~~ the good portions, the acceptable nutritious portions and absorb them back leaving behind the poisons to pass along

down and this you see results in the concentration of these poisons, so^{as} they pass along down where the serum portion of the blood is absorbed they become more and more concentrated all the while, so that the solution of poisons becomes more and more concentrated and the consequence is that these cells, these living tissues here, are subjected finally to a very strong, concentrated solution of these poisons. In the blood it is very delicate, but in the urinary secretion here it is concentrated many, many times--100 or a 1,000 times the degree of concentration found in the blood--and the consequence is that these living cells are damaged. They are injured and they consequently become degenerated and destroyed and that is Bright's Disease, so you see the real cause of Bright's Disease is the occurrence of an undue amount of poison in the blood, so the remedy for Bright's Disease is to keep the blood clean. That is the reason why tobacco smokers are almost sure to die of Bright's Disease if they do not die of something else sooner. Every man who has been smoking for several years has damaged kidneys, everyone without exception and every meat eater who has been eating meat for some years is certain to have damaged kidneys because of the great quantity of toxins absorbed from the colon where putrefaction is going on, so the man who has Bright's Disease should not eat meat.

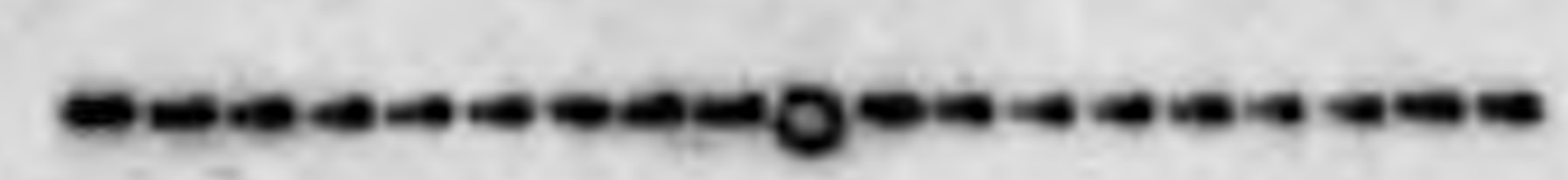
Here is a man who has tuberculosis of the lungs. The reason that man dies is that he is poisoned to death by the poisons accumulating in his lungs. That is what makes emaciation and other symptoms of tuberculosis or consumption--this consuming disease in which the poisons produced by the tubercle germs are brought down in the same way, excreted by the kidneys, and they have such a fearful effect upon the kidneys that 96% of all persons who die of tuberculosis of the lungs are found after death to have disease of the kidneys, Bright's Disease and other maladies of the kidneys, degeneration of the kidneys as the result of the action of this tubercular poison. Then, don't you see, nothing could possibly be worse than to say to a man who has tuberculosis, a man who has consumption and has kidney

disease, overworked, poisoned, damaged, crippled kidneys, nothing could possibly be more absurd than to feed to that consumptive the very thing that is forbidden to the man who has Bright's Disease. Nothing could be more ridiculous than that, but that is the very thing that is done almost universally. The man who has got consumption, he must eat meat, all the roast turkey, roast chicken and beefsteak and things of that sort ~~that~~ and oysters and clams and beef tea boullion, etc. all he can eat of it. That is the worst thing possible to do. I am myself convinced that a large part of the number of people who die of tuberculosis die because of the excessive meat eating which destroys their kidneys at an earlier age than otherwise. This has been found at any rate, that many a man who has gotten well of tuberculosis by the outdoor life with this over meat eating has got Bright's Disease of the kidneys and has died of kidney disease, although he got well of tuberculosis, so you see ~~that~~ it behooves us to live high enough so the kidneys will be well taken care of if we want to live long. We want to sit high, stand high, carry our heads as high as we can if we are going to adopt the high life, and we want to keep just as high up as we possibly can, and we want to practice in all our habits to cultivate things that are really high, and the highest thing we can possibly do my friends is to get just as near to Heaven's ways as possible, find out what God intended us to do. When God made man he established a certain order for him, established a certain dietary and establish a certain environment about him, established certain relations between man and other substances and made food for him intended to support his life, but now then when man turns away from the food heaven gave him, turns away from the food ~~God~~ God has prepared for him and goes down on all fours to gnaw bones with the dogs, to eat the scavenger diet which the turkey buzzard ~~xxxxxxx~~ feeds on, when he turns away from the ambrosia and the fruits and nuts and sweet things on the trees which God

asks us to reach up for, and turns his eyes down, throws himself down on all fours with these lower creatures who subsist upon the things which they have degenerated to, he must suffer some terrible consequences, and he does, and this, in my opinion, is the real source of the degenerative process we see going on about us, and the reason why we ^{have} degenerated so fast during the last 100 years and the last 50 years especially. Our ancestors lived simply. The average man eats day after day, every day of his life, as rich a dinner and as unwholesome a dinner, as disease-producing a dinner, as his ancestors had on Christmas or Thanksgiving, only once or twice a year. He has a roast beef or turkey dinner every day or three times a day, whereas his ancestors only had two a year. So we are multiplying our maladies by wandering further and further away from the natural road. We must return to nature. In returning to nature we are in other words returning to God, returning to the order which God marked out for us to walk in. I hope my friends you will take this to heart, think seriously over these matters I am telling you about. I have not said a word I cannot prove. These statements I have been making to you are based on scientific facts which cannot be concealed and the ~~xxxxxx~~ ~~ix~~ world is wakening more and more. The medical profession ~~as~~ as well as other portions of a community are, ^{giving} ~~taking~~ more thought and attention to this matter and are coming to recognize that the habits of live, the things we eat and the things we drink and the way we conduct ourselves are really the foundation of our longevity, of our appreciation of our lives. The correction of these evils is the thing we must see to if we expect to stem this tide of degeneration that is growing heavier in the civilized world. I thank you for your attention.

LECTURE

At Sanitarium Parlor, Battle Creek, Mich., November 16, 1908,
at 8:00 P.M. , By Mr. Horace Fletcher.



Dr. J. H. Kellogg:

Ladies & Gentlemen: You are to have tonight a long and ^{anticipated} dissipated treat. Twenty years ago I was riding on the cars one day and I happened to run across my old friend, Major Pond, who, as you know, was a whole lecture bureau. Major Pond said to me, "Doctor, I have got Mr. Beecher aboard and I want you to meet him." I said, "Nothing would give me greater pleasure." So he introduced me to Mr. Beecher--Mr. Henry Ward Beecher. Mr. Beecher finding out I was a doctor said, "I would like to talk with you about myself. There is something very curious about my experience. Now I think I have had about as much reason to think I have led a successful life as most men, about as much reason to feel satisfied with what I have accomplished as most men, but nevertheless I have now and then coming over me a strange melancholy and I don't care very much about this world or the next and I feel it is not natural and I would like to know what the reason is." I said, "Mr. Beecher, let me see your tongue." He put out his tongue and it really looked as though it needed the city scavenger after it. I said, "Mr. Beecher, I believe your digestion is not perfectly sound." He says, "You are entirely mistaken, you are entirely mistaken sir! There may be something the matter with my liver but my stomach is perfectly sound. It is all right: my stomach will digest anything." Three years later he died of appoplexy. I had a letter from Mr. I. K. Funk today, of New York, head of the Funk & Wagnalls Co., and he

told me of a similar experience. He said, "Twenty years ago I was talking with Mr. Beecher one day about diet. He was one of my friends, and he said, 'It is not necessary to preach to me about diet, for my stomach has an upper and a nether millstone. It will grind anything that gets between.'" I think Mr. Beecher's idea of his stomach was the popular idea of the stomach at that time and perhaps the idea of a great many people at the present time. There is still a notion that the stomach will grind anything that comes into it; that all a man has to do about food is simply to swallow it and get it down between the millstones as quickly as possible. I am astonished to see how many people there are today that seem to be possessed of that notion. It is like a lady who caught another lady feeding a baby a pickle and she protested, and the other lady said, "Why, he has never choked on it yet." Her idea seemed to be that anything that can be swallowed all right ~~xx~~ can be digested, but Mr. Fletcher discovered some years ago that the stomach has a duty to do and his study of the stomach has developed some wonderful new things that are threatening--promising I might say--to revolutionize the whole science of nutrition, and it is already doing it, and I think there is no man living who has done so much to revolutionize modern ideas, or old ideas, of nutrition or malnutrition, and has set so many people to thinking as Mr. Horace Fletcher, and you will have the pleasure of hearing him tonight. (applause)

Mr. Fletcher:

Ladies & Gentlemen: I may say in reply to Dr. Kellogg that the very largest encouragement that I have had during these ten or twelve years I have been making a study of the question of digestion has come from his splendid encouragement and through his co-operation, and many of the things that have slipped into my knowledge of the subject have originated with him, so that I speak for both of us in this study of the last few years. He gave

you a little incident in connection with the ~~life~~ of Reverend Henry Ward Beecher. I may give you another one. Only about four years ago I met in Brussels the authority who was writing the article on nutrition for the Encyclopedia Britannica, who was looked upon as the great oracle of knowledge of nutrition and metabolism and whose teachings were everywhere and were accepted as gospel truth. I brought to him a report from Professor Chittenden of Yale, and had the copy of the report showing that what he had been teaching was not only incorrect but actually poisonous. We had a discussion about it. I very modestly put forth the report of Professor Chittenden. There were several others in the discussion and he was not at all pleased. Finally he left the room in a somewhat impatient manner and went upstairs and he said, "I should think that a man who is as robust as I am, who is in as perfect health as I am, would not find it necessary to change his habits at this time of life. Within three months of that time he was stricken with paralysis or appoplexy and ~~lay~~ for two years lay unconscious before his death came from a disease which everybody knows, which all bacteriologists at any rate know is due to an excessive amount of protein. I would not have mentioned that fact if Dr. Kellogg had not brought forward the incident with reference to Henry Ward Beecher, and it is the case with so many people that they think they are in good health and in good condition when, as a matter of fact, they are very near collapse. And the symptoms of relapse are lack of energy--that tired feeling--and many other symptoms of that sort that are looked upon merely as common occurrences that must come to everybody but that are actually symptoms of collapse and then when people arrive at the point where there is a real collapse then they begin asking all sorts of questions and inquiring in all directions to find remedies. I think within the past twelve years we have discovered a remedy for many of the disorders of mankind, and we have discovered it not in the text ~~books~~ ^{books} of the physiologists

not through chemical physiology, not through any of the artificial means of studying the subject, but we have found it right within ourselves. This was discovered some ten or twelve years ago and the number of experiments that have been brought off to test it has been so conclusively in favor of the fact that it is a true discovery of a great natural protection--they have been so many in number and so confirmatory of each other that I think I may safely say here tonight, and I think Dr. Kellogg will indorse what I say, that we have within ourselves a means of protection against all of these disabilities, against illness, against a lack of energy and practically against old age up to a certain extent, and during these ten years that we have been investigating the subject and getting an accumulation of evidence we have all the time been trying to accomplish--and I think we have done so to quite an extent recently in separating digestion into two parts, voluntary and involuntary.

Voluntary digestion consists of two details, the mental and the dental, ^{The field of} Voluntary digestion only occupies about three inches of the alimentary canal, namely, in the mouth. The field of involuntary digestion is all of the rest of the alimentary canal, approximating something like thirty feet. The personal responsibility that we have is in the field of voluntary digestion, ^{herself} Nature has given us three inches and has [^] taken on thirty feet of the problem. The trouble has been formerly in considering this question that we have been paying no attention to the voluntary part and have been doing all sorts of speculating about the involuntary part, but now we have concentrated upon that little department, that small field, and we find that by an understanding of that and the use ~~of the use~~ of the protective functions that are there that we are able to bring about perfect digestion and assimilation and all of the pleasures that come from what we now call dietetic righteousness.

I will explain to you as briefly as possible and describe this field of our responsibility and the functions contained therein. In the first place,

without using the blackboard, I think I can give you a very good illustration of the tongue and of the portions of the mouth that are approximate to the tongue about which it is desirable to know. This (illustrating with his hand) represents the tongue, the fingers the flexible portion of the tongue and the heavy part of the hand the heavy part of the tongue. This represents the roof of the mouth and this the soft palate hanging down behind. On the tongue right here are five little projections, in fact they are very large as compared with the small space of the mouth, but there are five of them and they are called the circumvallate papillae. Around each one of these is a little trough or depression and within each one of these depressions there terminate an endless number of taste buds. This little row in ~~maxxax~~ horseshoe form is placed just in front of the place where the tongue fits against the roof of the mouth. It fits ~~ix~~ against the roof of the mouth just at the point where the hard palate and the soft palate separate. This is the relation in the mouth, the tongue moving about in this way and pressing the food out against the teeth and pushing it up against the roof of the mouth, but let me tell you what happens in the space in the relation of the juxtaposition of these two parts of the mouth. When ~~axpax~~ food is taken into the mouth--perhaps it may be a piece of bread that is comparatively ~~taxkkak~~ tasteless, that is to say, there is no taste in it until it mixes with the saliva and the chemical transformation begins--but when it is first taken into the mouth the lips close and at the same time this gate at the back of the mouth closes so that the mouth is like an air-tight box. You can very readily see that there is a complete closure at the back part of the mouth by simply filling the cheeks with air in this manner (illustrating), showing that there is complete occlusion, complete closure of the gate, and consequently

when the mouth is closed in that way it is shut off entirely by holding the head down in this way (illustrating) so ~~ix~~ the tongue will hang ~~perpendicular~~ perpendicularly in the mouth, and beginning the process of investigation you will note that as the ~~the~~ saliva mixes with the food material of the bread as it becomes creamy and as the taste develops and as that beautiful taste ~~is~~ which bread has when it is transformed into sugar by the action of the saliva develops, at a certain moment the creamy material will run up the tongue. It is a surprising thing, but it will run up the tongue. If you were to go down to Niagara Falls and should observe some morning that the falls were running up instead of running down you would think it was a wonder of nature and still that is just what happens in regard to the mastication of every morsel of food. The tongue is so muscled that there is a little conduit in the center, in the middle of it, and as the creamy material goes up the tongue and arrives at this gate in the vicinity of the circumvolut papillae there is a slight feeling, scarcely a tickling, but a slight feeling, and there is the invitation to relax and swallow. I can explain to you very easily how that swallowing process takes place, and I think I will do so.

In the first place the reason why we hold our head down in this way is because this is the only position of the head in which we can swallow easily. If you hold your head horizontal in this ~~rather~~ manner--and I advise you to try it now because it will be a discovery to you undoubtedly--you will find it quite difficult to swallow. You have practically to make a contortion when you swallow. If you hold your head up a little like that you find it is impossible to swallow without considerable contortion, but if you hold your head down you find you swallow with greater ease. Some people have argued from that that the natural position of man when eating his food is on all fours, but I think we have outgrown the necessity of that now, but the action of swallowing occurs in that way. This has been proven by Prof. Donders

of the University of Bonn, in Germany, and has been corroborated by Professors Higgins and Hégér that the soft palate, hanging down behind at the roof of the tongue, ~~is~~ from a suction unfastens with an act of pressure, but it is a suction, and that the soft palate is muscled in such a way that it hugs the tongue like that (illustrating) and forms a distinct negative pressure so that when the food arrives at the gate and the gate opens it is sucked back and the process of swallowing occurs. That is done through the larynx being brought forward. If you make a swallowing motion you can feel that the larynx is brought forward underneath the roof of the tongue so as to protect it and the ~~pharynx~~ pharynx is brought into place for the food to be dropped down into to be taken up by peristalsis. Now the interesting part is, and by the way the next time you have an opportunity I would like to have you take morsels of food and treat them in the manner I suggest and note this perceptible involuntary swallowing, note just what I have told you of the food becoming creamy, of the taste developing and of the creamy substance finally running up the tongue to the gate, the opening of the gate and the swallowing. That is the whole process necessary in the act of taking food into the body to insure several things. In the first place it insures the insalivation of the food, the mixture of the food with the saliva in order that the saliva may do whatever it may in the chemical change necessary to digest. In the second place it prevents lumpy food going into the stomach which cannot be reached by the digestive juices, and in the third place, and in the most important part, it allows the appetite to discriminate so that there will not be taken into the body more than the the body needs for the moment.

There is no doubt but what appetite is the language of the body just as in the same way thirst is the language of the body relative to the replacement of ~~the~~ water, and the appetite is such that it will reach out

into unknown foods--foods of unknown composition--for just the materials that are required for the moment in the body; for the amount of protein and the amount of carbohydrates or the mineral salts or whatever else is demanded by the body temporarily there will be a distinctive inclination of the appetite. You want something containing that particular ingredient and if the ~~appetite~~^{food} is only taken as I have described then the appetite will have an opportunity to discriminate accurately and we know that just as much as the body needs has been taken into the body, then the appetite will have ceased and there will be no more desire for food.

Now the question may be asked, "How may we know what is a perfectly normal appetite?" That is a very prudent question, and there is a way by which you can test ~~the~~ it very readily and very surely. ~~Remember~~ Remember that none of the senses which occur below the throat--all-goneness, faintness, all of these symptoms--have nothing to do with ~~the~~ true hunger. They are merely symptoms of some pathological condition of the stomach, some disordered condition of the stomach. Where you want to look for real appetite is in the watering of the mouth and the sense of desire for the gratification of taste. You may say really that the sign of a true appetite is the watering of the mouth. I have been asked many times how it can be tested and I find there is a very good illustration that seems to take well when I have given it to audiences, and that is this. Suppose you have been out playing golf or suppose ~~if~~ you have been out mowing hay or suppose you have been out for a long walk. Suppose you have really earned an appetite. You have given your body an opportunity to demand something and to demand it in the terms of appetite and you are going home and as you go home a window is opened and there comes out of that window fumes of bread being taken out of the oven and you find yourself standing there sniffing ~~the~~ and beginning to whinny like a horse, then you know you have got a good appetite. That is an inevitable sign of a good

appetite, and having a good appetite you partake of the food available that appeals to the appetite and take it in the manner that I have said and what will happen. Only that food will be taken into the body that the body needs and the condition of the body for the reception of food is like this: It is like dry blotting paper. You know dry blotting paper is so attractive to moisture that if you put a corner of it into a pail of water it will suck the water up, lift it up until it is saturated with it. In just the same way when the body is properly fed in the manner that I have described; the food is very easily digested and very quickly assimilated and you ~~know nothing~~ hear nothing whatever of a report from the department of involuntary digestion. But there is another thing to be taken into consideration and these things should be taken together. Always remember that the two departments of preventive hygiene--I won't say preventive medicine--preventive hygiene, that are really important and coming to the fore are the mental and the dental. They are both located in the head and they are both related to enjoyment or otherwise. It has been shown by Professor Cannon, of Harvard University, that any irritation whatever will cause a paralysis of digestion and I may give you a little illustration of this. Doctor Cannon uses cats that have been trained for the purpose and they are very amenable to the test. They are allowed to become good and hungry. When they are sure to be good and hungry and have a good appetite they are given the food that they like best, but this food has been stained with subnitrate of bismuth, which is opaque to the X-ray. This study is made, I should have said in the first place, by the aid of the X-ray. The body itself is luminous to the X-ray, but the food stained with the subnitrate of bismuth is opaque, so consequently when the food goes into the gullet of the cat and is swallowed and goes into the stomach you see by the shadow what is happening within just the same way as

you can tell what is going on behind a curtain when there is a light behind the curtain by the silhouette on the curtain. When the cat is strapped upon the screen he feels just as though he were lying down by the fire. It has become a happy process with him, and by means of the X-ray you can see the food going down by peristaltic action to the cardiac opening of the stomach, that opens, it goes into the stomach and it begins to move about down the fundus until by and by you will begin to see the shadow hesitate at the pyloric gate, at the second gate of the stomach as it were, and there will be an opening there and some of it will pass through, ^{then} the little valvule conniventes which are associated with the assimilation of the food, begin to dip down in this way, five or six hundred dips to the minute, sucking the food up and it all goes on very merrily, but suppose you distract the attention of that cat for a second so his mind is carried away to some distance that whole process begins to slow up, then suppose you irritate the cat until he spits, instead of purring, then the whole process stops. There is paralysis of the digestion and ~~that~~ not only that but you may get the cat good natured again immediately but it takes a long time to renew the momentum of the process, to get started up again, to go on with the process as it were, consequently it may be taken for a fact and a truth that a little squabble at meals, anything like abstraction at meals, anything like anger or disturbance of any kind at meals or anything opposed to the ~~ax~~ happy enjoyment of the food is poison because that very moment the digestion stops and there is paralysis of that digestion. Just that moment the antagonistic bacteria immediatly swarm into it and decompose it just the same way as it would decompose in the gutter and with exactly the same result. The fumes of putrid decomposition are let loose in the body and find their way into the blood and into the lymph ~~xxxxxxx~~ streams and the pabulin of the cells and consequently the cells themselves,

which are so important to us, to the body, are feeding off of polluted nutriment just in the same way as we should find ourselves getting into a bad state if we were living on the side of a stream infected by typhoid fever germs, so consequently any irritation ~~at~~ the table, anything in the way of a scrap, anything in the way of a disturbance or discomfort, in fact anything that is opposed to the enjoyment, to the sweet and wholesome enjoyment of the food is poison. You do not feel ~~xx~~ it at once except in the case of acute indigestion. It has been known, and I think all of ~~you~~ us perhaps have had the experience, that the receipt of bad news will cause acute indigestion immediately. It has been known that an angry word has ~~sour~~ soured the milk of the mother, has given cholera to the child and caused its death so that these things must be cared for very very assiduously.

Remember it is the mental and the dental. Is not the chewing of food an important and a ~~xxxx~~ holy function? Prof. Pawlow in his laboratory in St. Petersburg has shown that the gastric juice flows in response to psychic stimulation, that is to say, it is the enjoyment of the food which turns on the flow of the gastric juice. Prof. Pawlow is a very skillful surgeon as well as a competent physiologist and through his surgery has been able to demonstrate that this is the case, and the result is that the theory which has been established for seventy years or more, nearly one hundred ~~years~~ years now, that of Beaumont from his experiments on Alexis St. Martin, that juices of the stomach were excited by the physical contact with the food, is now exploded, and we know that it is the enjoyment of the food that comes through careful chewing and careful ~~xx~~ insalivation that turns on the flow of gastric juice into the stomach. Prof. Pawlow, and I have this direct from Dr. Kellogg, who has seen the operation in his laboratory, cuts the esophagus of the dog and to the upper portion of it a tube is attached and this tube comes down to the ground or back into the ~~pan~~ pan from which the dog is eating. The

lower portion, which is connected with the stomach, is entirely severed. The dog is given food which gives it enjoyment and it chews it merrily and happily and swallows it, but instead of its going into the stomach it goes right back into the pan and the dog eats the food over and over again and in the meantime there has been flowing into the stomach quantities of gastric juice, and Prof. Pawlow with his skill has made a fistula in the stomach, has put in a syphon so the gastric juice is syphoned off and put into bottles in which it is stored, and we use it to increase our own digestion, and it is very good stuff. I have tasted it and it tastes just ^{like} hydrochloric acid, and I had rather have it than the digestive juice of any man I know of, and there is no objection to it, and there is no objection to the process, and it is interesting to know that the enjoyment of the food is a process necessary for the proper formation of the digestive juice. I think Dr. Kellogg told me that Prof. Pawlow had one dog that worked up to eight hours a day and produced several liters of gastric juice. That dog is a good asset. Of course the food finally has to be put into the dog's stomach for digestion otherwise the gastric juice would soon give out, but it is interesting to know that all that process of which we are speaking occurs right around here in the head. It is right there close to our nose, it is right close to our eyes, right in contact with all our senses, with the olfactory, with the blessed sense of taste, and all we have to do is to wait for a keen appetite which is necessary for enjoyment, then get all the epicurean enjoyment out of ~~the~~ food we can, then stop when the appetite is cut off and we have filled all the requirements of nature and in doing that what have we found? Understanding that and the use of it for a period has given such increased strength and immunity to sickness that it is perfectly surprising. It is surprising to the physiologist, it is surprising to athletes, and we have right here within our midst Mr. Granger one of the staff here who has made a world's record as a result of paying

strict attention to the ingestion of food in that economical manner. I presume his story has been told to you, but it is being told all over the world now wherein he, after a month of assiduous fletcherizing on the foods of the Battle Creek Sanitarium, was able to do the deep knee bending, which is this act (illustrating) 5002 times without cessation, occupying a time of two hours and nineteen minutes/ and being the most prodigious feat of the kind that is known. Mr. Granger is here and if any of you do not believe it he will repeat it for you at any time, or if you don't believe Mr. Granger try it yourself, but it was prodigious, and it has come about through dietetic righteousness. Consequently may we not say that the ingestion of food is a holy function ~~and~~ for it is practically serving upon the alter of our nutrition. It means amiability, it means energy with which to pursue altruistic work, it tends toward altruism because the healthy man is naturally an altruist, and altogether it is criminal to neglect it. It is as criminal to take food in an unhygienic manner as it is to pollute the stream of your neighbor. You are poisoning yourself instead of your neighbor, hence the greater your responsibility. I will say in this connection that as a result of the agitation that has taken place over the world by the attaining of the lowest economy from the taking of food it has practically led to revolutions the world over. I go back and forth between this country and Europe and each time I go to Europe I find there is a very decided spread of the wave of economy that has come about through these investigations. When I get back to this country I find the same progress is made there, and it is now pretty surely established that we have within ourselves the means of control of our own nutrition in such a way as to secure as nearly perfect health as possible, and of course great stress must be laid upon the mental as well as upon the dental. Bear that in mind.

Have any of you any question on any point that is not clear to you or upon any point in your own experience that needs elucidation?

Dr. Kellogg: Mr. Fletcher, I am sure our friends would like very much to hear about what Fletcherism has done for you. (applause) You don't look very much like an invalid and perhaps you will tell us what it has done for you.

Mr. Fletcher: In the first place, let me tell you the most essential thing it has done for me. It is this: I am at this moment and all the time and have been for the past seven or eight years a perfect fountain of love. I love you all whether I know you or not. I love everything. It has given me the most beautiful optimism that any person can imagine and I find the disappointments and the annoyances, if they may be so called, in life have disappeared. ~~As~~ like mist before the sun. They do not exist. Sometimes you will see attempts at that, but they do not affect you in the least and it is of the utmost importance.

As far as my physical self is concerned, some twelve or fifteen years ago I was denied life insurance. I was a very obese person. I could not run to catch a car without coughing for an hour afterwards, and I was in a state of collapse. The men who were my contemporaries at that time have all gone away but one. Only one of them is living and I was fast going. My attention was called to this subject through the adverse reports of the insurance examiners. I was just retiring from business at that time. I had visions of a happy sunset of life and I was confronted with the fact that I did not have the means, the equipment or any expectation of the enjoyment of what I had been looking forward to. I took up the study of the subject myself. ~~xxxxxxxxxxxx~~ I knew that if anything was the matter with me--I had such confidence in nature--I knew if anything was the matter with me it was my own

fault. I knew that the trouble from which I suffered was due to malnutrition and I judged that the malnutrition came from my disobeying some of the beneficent requirements of nature. I took up the problem just as a person would work out a personal problem. I went to the authorities, as I say, and found there confusion and very little attention devoted to this three inches of the alimentary canal, and I said to myself, "If nature has given us any responsibility in this matter it is within the field of our responsibility and hence must be before the food is swallowed." I told them that I had hit upon a cue to the study of the subject, so I stepped aside and took up the study of the subject and kept it up for a number of years. But within three months of ^{that} ~~the~~ time ~~that~~ I began to find out what taste meant. Of course I had to masticate my food and keep it in my mouth in order to study the development of taste and had to observe all the details of the development ~~sixxxxxxx~~ of taste and that led me to my performing just what nature required of me to perform and as the result of that within three months I had lost from 50 to 60 pounds of my obesity. Two of the chronic diseases for which I was denied life insurance disappeared. I had taken on energy that I did not remember since I was a youth and shortly after that ~~all~~ on my 58th birthday in making a test I rode nearly 200 miles on my bicycle in one day and felt myself far better afterwards, and altogether found myself a new man. Then I slept a few hours and immediately afterwards rode 50 miles more before I got any food to test my condition. There was no soreness and practically no fatigue. There was none of the fatigue of sore muscles, none of that at all. I got very sleepy, so sleepy I could not sit on my bicycle so I went to bed ~~ix~~ but in five hours I woke up, after five hours of profound, dreamless sleep I got up, jumped on my bicycle and rode 50 miles as a test of my condition and I have been going ever since that time. That was some eight years ago, and ~~ix~~ ~~xxxx~~ every year since that time that I have been brought up for examination

I have shown increased muscular quality, increased muscular endurance and increased strength, not as the result of any systematic exercise but as the result of dietetic righteousness during that time. I have kept out of the body the poisons which Dr. Kellogg calls autointoxication. I am supposed to have kept out of the body these poisons, consequently the pabulin of the cells has been pure and this is an inference that they have been enriched from pure material and have been going on ~~and getting~~ and getting better and better and stronger and stronger, more like new rubber, whereas in olden time they were like old stale rubber, and anytime I am called upon at a moment's notice to do any stunts of endurance or strength each time I have found myself better and better than before. It was only the summer before last, in 1907, ~~that I~~ Now even after I had come back from fifteen months in the Orient where I had been subject to every sort of variety of food and every sort of variety of climate and where I was under a particular strain during the whole time, as Dr. Kellogg can tell you, coming back and having had no systematic exercise, I was called upon to test a machine--one of Professor Fisher's machines in New Haven, one that had been built while I was away--and I lifted with the muscles of my ^{calf} ~~ankle~~ and foot, in the same way as a mother would boost a child, I lifted 300 pounds three hundred and fifty times consecutively. That happened to be record breaking and caused a good deal of attention, but about a year after that I happened to be at Springfield at the International Young Mens Christian Association Training School College where they train young men from all over the world for positions as directors of gymnasias and secretaries of Young Mens Christian Associations in different parts of the world, and I went up for another purpose. I went up to deliver a lecture, but was called upon by one of the representatives of the institution who asked me if I would not go up to the college and give a

demonstration. They told me the young men there had been attempting the stunts that I was supposed to have performed at Yale and they found them so difficult that they thought there must be something about it that they did not understand, and wanted to know if I would go up and show them. I felt a little bit peaked at first that I should be called upon every time there was a "Doubting Thomas" to do these endurance stunts. It was not very agreeable, but never mind, I soon found out what an institution it was and what a delightful center it was--a radio-active center--so I said that I would be very glad to go there, and ~~xxxxxx~~ I went up the next morning, and after two lectures of an hour we went over to the gymnasium. We went over to the gymnasium and I saw there that they had a lot of apparatus brought out, and then again they urged me to give a physical demonstration, and I finally, after a good deal of hesitation, which increased the incredulity, and I did it purposely because I had made up my mind that I would either fail in a spectacular manner or win in a spectacular manner, so I rather encouraged the doubt for sometime and you could see it written all over the faces of the young men, and afterwards when I accused them of it they admitted the fact, and the look on their faces was ~~xxx~~ as much as to say, "Aha, we found a flaw in the work at Yale. The reason the old man doesn't do it is because he can't." So finally when they had been worked up to a fine concert pitch, I said, "Well, if you will suggest something I will do something," rather in a impatient way, and finally ~~xxxx~~ they said, ~~xxxxxx~~ "Is there anything you would choose?" I pointed to a machine and said, "They had one of those ~~xx~~ machines at Yale. I tried it when I was there a couple of months ago and lifted on that machine with the back muscles 550 pounds, and Prof. Berry came forward and said, "Mr. Fletcher, if you can lift 550 pounds on that machine you will satisfy these young men. I believe 298 pounds is the average for all the students

coming to the university of some thousands who have been tested." 298 pounds was the average of people of my inches and weight in lifting that way, so I said, "I will try it"; so they ~~was~~ brought out the machine. I stepped on it and gave a ^{lift} ~~lift~~ and you may be sure there was a good deal of psychic influence in it, because when they looked at the dial I had lifted 770 pounds instead of 550 pounds. ~~(Applause)~~ (Applause)

Now don't think I am bragging about my personal accomplishments. I am telling you just what mother nature did through me as the result of dietetic righteousness. I am the poor instrument through which she worked and I don't take any of the credit for it. Then I said to them, "Perhaps the dial was not set right. Let us try it again". And I lifted approximately as much again. Then they brought down the football players and their heavy men and nobody came within 60 pounds of me until--and now here is the interesting part of the whole matter. Professor Berry said to me, "Mr. Fletcher, I don't know whether you know it or not but we have got a Fletcher Club among the students here. They practice your suggestions, not to help them in their athletics, for they are not athletic men, but for economy." "Now", I said, "I would like very much to see one of the men." He said, "McGuire" you are one of those men aren't you?" McGuire said, "Yes, Yes, I am. I have been practicing it for six months," and he came down, and McGuire lifted 60 pounds more than I did, showing that it was the method and not the man, and I had a report from Prof. Berry sometime afterwards giving the result of six months of experiments, and he said, "It may gratify you to know that McGuire's men, who are not in training have increased 31% during this period, and the men in training who have had the prescribed dietary and the regulation training table have not increased and in fact they are not quite up to what they were in the beginning. I received a similar report from West Point. Dr. Anderson and I went up there and spent an afternoon with the young men

connected with the different departments of athletics, football, basket ball and other departments, and we met them, and after six months training I got two reports from West Point corroborating the improvement we got at the Young Mens ~~SM~~ Christian Association at Springfield, and from every direction I am getting the same reports of increased muscular endurance, increased energy for work and ease of doing work, simply as the result of dietetic fighteousness. I can go on and give you these illustrations for an hour or more because they have been accumulating in great numbers. One of them happened at Chautauqua last year where Mr. Stapleton, the famous wrestler who was one of the test subjects in Prof. Chittenden's experiments gave testimony to the fact that as the result of what he called fletcherizing continuously for a long time he had been able to ^{more than} ~~xxxxxxx~~ double his ability to lift himself on the ~~sm~~ parallel bars in this way (illustrating) in training. At the time of the beginning of the Chittenden experiments he was able through training to lift himself 24 times and he was a very heavy man, but he said, "Now, without training, I am able to go up on the bars and do it 50 times." Now think what that means to any of you. Think what that means in an emergency. Think what it means if you have your life to save or the life of somebody else to save, but that is very small. These emergency cases are of very small importance as compared with the ease in which you are able to do your work.

Dr. Kellogg has oftentimes testified to the ease in which he does his work as the result of dietetic righteousness. You all know the amount of work he does. It is prodigious. It is scarcely believeable. When it is told away from here one is certain to be set down in the list with Ananias, but it is a fact and he does it so easy and is always good natured. I don't imagine that any of you could perform the work or the feats done by Prof. Kellogg because he is one of a thousand, but at the same time if we can increase the ease with which we can do our daily task we have accomplished a great deal.

Question. In a few words what does fletcherizing mean?

Mr. Fletcher: In the fewest words possible it means waiting for a keen appetite, waiting ~~wait~~ a meal or two if necessary, but be sure you get a keen appetite before taking food, then take the food that appeals to you most of the food that is available and chew it, mind you, paying attention to the enjoyment of it, until it swallows itself and that is all there is to it.

Question. Are you a vegetarian?

Mr. Fletcher: Theoretically I am not. Practically I am. The reason I say I am not theoretically is because I am a ~~bro~~ student of this subject and I am giving attention to everything that nature permits considering that it may be a ~~food~~, but as the result of my experience in careful eating of food I have practically cut out flesh food from my dietary and as I say I am practically a vegetarian. I believe in it thoroughly and I believe in the principles of the Battle Creek Sanitarium, still at the same time I, as a conservator in the subject, do not attach myself to any prescription. I believe from that standpoint that I am a better advocate than if I were a member of any vegetarian society. I certainly believe thoroughly in everything I have ever heard Dr. Kellogg say.

Dr. Kellogg: I shall have to be very careful what I say hereafter in your presence.

Question. What is your age Mr. Fletcher?

Mr. Fletcher: I will be 60 next August. It is not a great age, but since I am ten years younger than I was ten years ago you can multiply that and see what that means.

Question. What have you eaten today. Dr. Kellogg told us the other day what he had eaten that day and we would like to know what you have eaten today.

Mr. Fletcher: Now I tell you, I enjoyed it so much I didn't stop to

see what it was. I will tell you just as a matter of fact that the first food I had since yesterday noon, and I had a pretty strenuous afternoon as I had to give two lectures yesterday at Rochester and I came over on the train last night, I satisfied my appetite after 24 hours of abstinence with a portion of protease roast with tomato sauce on it, and some tomato bisque soup. I had a portion of grapes, a glass of cream, some browned parsnips and a toothpick (laughter). I don't starve myself I assure you and I get all the good I can out of food, but I don't pass anything down into the stomach to be tasted secondarily.

Question. Do you ever eat any meat at all?

Mr. Fletcher: I never do from choice. Sometimes when I am the guest of a house I sometimes enjoy a bit of chicken but I never would want it. It is purely perhaps not to be peculiar. We never have meat in our house at ~~Man~~ Venice unless we have guests. sometimes I am very fond of fish. I may outgrow that but I think I could say now that if a person were to say to me that I could have nothing else but farinaceous foods and vegetables and fruits the rest of my life I would be very happy about it.

Question. How long do you set at a meal?

Mr. Fletcher: It depends upon the company.

Question. Suppose you are by yourself.

Mr. Fletcher: If I am by myself I am in bad company and I do not sit long. When I was under a severe test at New Haven the food that I took at that time was very simple. I did that because of the difficulty of analysis. It is very difficult to accurately analyze foods, consequently I picked out what I knew I was going to enjoy for the whole of a period of a week and my ration for each day consisted of a cereal, the curd of milk and some sugar. I took two meals a day, one at 12 o'clock and one about 6 o'clock

and I required from 12 to 14 minutes at a meal, that is, from 24 to 28 minutes a day in order to sustain myself. At that time I was undergoing the most strenuous tests, all the exercises of the varsity crew doubled besides other work and ordinary activities and during that week I added a little bit to my weight. It was insignificant, but I practically kept my weight. The cost of the food during that week was 77 cents. The time occupied, as I say, was less than half an hour a day. A person beginning to cure bad habits of nervous haste in eating may require considerable time and it may take him a long time to eat a meal, but I think that everybody who has fletcherized consistently for a long time will find that he practically required half an hour a day, fifteen minutes at each one of the two meals if he is altogether industrious, but of course he does ordinarily occupy more time because he is not eating all the time.

Question. If you ever eat meat I don't see how you can ever chew it until it is creamy. I can't fletcherize it.

Mr. Fletcher: What do you do to it?

Answer. I just swallow ^{it} ~~the~~ whole. I haven't eaten any for a year.

Mr. Fletcher: Just like any other dog.

Answer. Yes, I swallow it whole.

Mr. Fletcher: No, I don't mean to swallow it whole.

Question. I don't see how you get it creamy. That is why I stopped eating it.

Mr. Fletcher: I think that is a very wise thing to do, to stop eating it, but I will tell you the attempt to chew meat almost invariably leads to the discarding of it. Persons who have been brought up on meat, who have been accustomed to it, will readily discard it, and that has been the experience throughout. The experience has been that a person taking his food in that careful manner has gradually come to take farinaceous foods and vegetables

and that sort of things almost universally.

Question. How do you fletcherize a liquid?

Mr. Fletcher: "Oh, that is easy. You do that just as the wine tasters taste their wines, and as the tea tasters do it. That is the only way to get the pleasure out of it. That is the way ^{you} ~~to~~ get the enjoyment of your soup. You take it in little sips and you get the delicious taste out of it. If you swallow it quickly you do not get but a passing taste and that is all, but that is easily remedied. To have any taste to them at all they should be sipped just as the wine tasters sip their wine.

Question. Do you think it is inadvisable then to be talking during ~~xx~~ mealtime, to be busy all the time?

Mr. Fletcher: It depends entirely upon the nature of the conversation. If you are enjoying anything that is optimistic, in a discussion that is optimistic that is favorable to digestion, but anything that is in any way pessimistic or controversial is prejudicial to the condition of the mental state ^{so} that causes discomfort.

Question. Is it your idea to eat just when you are hungry only without regard to regular time at meals.

Mr. Fletcher: If the mealtime comes and you are not hungry then by all means do not eat, but the chances are that your appetite will accommodate itself to ordinary regular meals. There is no difficulty in that regard. We at Venice have practically one meal a day. There is one set meal anywhere from twelve to two o'clock according to convenience and that is after everybody has done a days work. Then there is something always in the evening if we wish it but that is ~~only~~ practically the only set meal. In every case where it has been taken up in a house that I have known of there has been a perfect release from the bondage of housekeeping. It has been made so easy

and then when you come to think of the amount of saving compared with the amount which you spent formerly it is astonishing. What I believe to be a very conservative estimate is that in the English Speaking world over 200,000 families are saving from a dollar a day upwards on the question of their subsistence through the publicity given to these experiments. That means something 75 or 100 million dollars a year in the United States.

Question. How many calories do you eat?

Mr. Fletcher: I do not count my calories. In the calorimeter Dr. Kellogg and I had very much the same experience. He has been through the ~~same~~ calorimeter and so was I. I was there for 84 hours once and the number of calories that were measured out was about 1700 I think or 1800, if I remember correctly, but the amount of food I took in the meantime only measured about 1200 calories, and I think Dr. Kellogg had about the same experience.

Dr. Kellogg: I took none at all.

Mr. Fletcher: No food at all?

Dr. Kellogg: Nothing.

Mr. Fletcher: Oh, you didn't?

Question: Mr. Fletcher describe your experience of walking eight hours in the morning with no food at all--the no breakfast plan.

Mr. Fletcher:

I am writing at the present time an essay under the caption of ~~Insomnia~~ "Insomnia and Sleep." The question is, "When shall the pleasure be taken and when shall we work, or how shall we occupy the time?" It is my habit to go to bed as soon as I have a chance, if I am ^{sleepy,} ~~sleepy,~~ sometimes at eight or nine o'clock when I am at home at Venice, then I wake up at any-time from four to five hours afterwards or at one or two o'clock in the morning and have everything all ready and I work from that time until I am tired, say six or seven hours on a stretch. That is the time when the mind is clearest,

when there is no interruption in the stillness of the night, when the eyes are rested and the body is rested and there is no supplementary strain put upon them and I get off a tremendous amount of work, sometimes five or six or seven thousand words of writing. Then, mind you, I don't get up because just as soon as ever I get into my clothes I cannot work. I bolster myself up in bed, have the lights prepared, everything at hand, then when I get worked out and perhaps feel a little drowsy I snuggle down in bed again for half an hour or sometimes an hour, then I get up and I have got the whole day ~~and~~ ahead of me. In that way I have been able in the past four or five years to put in practically two days work into one without any strain and without any discomfort. I think that is of great value, If anybody wants to accomplish much, because it is not necessary that you should carry your work about with you but you can carry study about with you and you have at hand anything in which you wish to make yourself spend those hours that you ~~usually~~ ordinarily would be working or that you would ordinarily consider a period of insomnia in good constructive work. I have been making that a special study for all these years that I have been interested in the subject and I find the best thing ~~whenever~~ for me to do ~~whenever~~ whenever I am tired is to go to sleep at once. If I have only two hours or one hour in which to perform a certain business or a certain piece of work that is important the first thing I do is to lie down and sleep or if not sleep shut my eyes for five or ten minutes and then I rise with my eyes rested and feeling much better. That is only a personal habit of mine. I don't know whether to recommend it. But inasmuch as we are individual problems, no two alike, it is quite necessary for us to be our own guardians and scientists, study ourselves, follow the behests of nature along the line of easiest resistance and she will respond very generously to our conformity with her requests.

Question. What about water? Do you use much?

Mr. Fletcher: The practice of fletcherizing as it is called rather diminishes the amount of water required. Just why I cannot tell. I drink water when I am thirsty and only as I am thirsty without regard to any particular time. I never take water with food in my mouth but if I am thirsty during a meal I take it and I have had no bad results. I should think that the taking of a large quantity at any time, ~~as~~ drinking a prescribed quantity might be injurious to the system. In the Philippines I know that the horrible tortures of the water cure simply mean compelling the patient to take more water than he wants, which is what any prescription is liable to do. That water that you evaporate or that you perspire has to be replaced. That is good advice, isn't it Dr. Kellogg?

Dr. Kellogg. That is true.

Mr. Fletcher: Of course if you go out and walk or go into a Turkish bath or an electric bath ~~and~~ or you go out to play a game and you dispose of water in that way you have got to replace it, but I don't believe in supersaturation of anything.

Question. Then you don't believe in the milk diet?

Answer: I love milk. I lived ten days once on milk-nothing else passed my lips and I got so I was sorry I had grown up and had to go back to the other foods I enjoyed it so much, but I fletcherized it very carefully and the amount required was less than 2000 calories per day.

Question. How about the quantity of proteins ~~ix~~ you think necessary? Do you lay any stress on that?

Mr. Fletcher: I am positive from my experiments in the laboratory and what I have seen as the result ~~is~~ that any excess of proteins over what the body demands is poison. Now as to the amount of protein: the standard that was set up by Prof. Chittenden was the standard that he established through the use of fletcherizing. If you take your food in the way that I suggest ~~ix~~

you will reduce your protein to the equivalent of about 40 or 50 ^{grams} ~~grains~~ per day or perhaps 60, or even less than that.

Dr. Kellogg: Prof. Chittenden makes it 30: I make it less than that.

Mr. Fletcher: Yes I think so. I know my daughter lived 25 years on between 25 and 30 ^{grams} ~~calories~~ of protein per day.

Question. How much would that be in calories?

Dr. Kellogg: Just four times as much. There are four calories to the ^{gram} ~~grain~~, so there would be from 120 to 200 calories .

Mr. Fletcher:

I have never known of anybody suffering from lack of protein because as Prof. Foiln said and as Prof. Mendel said and has ~~wix~~ written that if your body is not fully supplied with protein, if there is not a full saturation of protein in the body you will crave eggs or something of that sort that contains it no matter whether you know about protein or not. There is just as decided a craving for it as there is a craving for water in thirst. It is thirst in other terms.

Question: Do you think it is safe to trust your cravings?

Mr. Fletcher: If you will take food in the way I say it will not be a week before your secretions are running pure. It is just like taking away the pollution at the source of a stream. We have been polluting the body: we have been polluting the secretions by this autointoxication. If we stop taking into the body--stop autointoxication--the stream runs clear very quickly and I think that 36 hours of abstinence from food will make anybody's appetite normal. I won't say that dogmatically, but that is my view and another thing let me tell you, and I am glad it has come to my mind. The person who fletcherizes carefully, assiduously, for a length of time ~~xxxxxxx~~ cannot tolerate alcoholic ~~liquors~~ stimulants. He comes back to the condition of a child where he cannot tolerate it. The appetite simply sloughs off.

One of the physiologists of this country told me when I came to this country to come under examination that he himself, a doctor, had gradually begun to prescribe for himself whiskey. He began with one glass a day but he found finally that was not enough, then he prescribed two and finally about the time I came he had prescribed four. He tells this story on himself. He found out within about three months from the time he began fletcherizing that he had ceased to take his whiskey, had ceased to think about it, had forgotten all about it, and he tells me it is the same among students or others, that all desire for alcoholic stimulants sloughs off, and the same has been noticed in regard to sexual morbidity; where there was a sexual tendency for morbidity, it has gradually disappeared and the normal condition of sexuality has returned so that it seems almost a panacea and why shouldn't it be a panacea? If you get back and find the secret of nature and nature's desires of normality anything and everything is liable to clear up. It is not like a medicine that is a cure-all but it is taking away the source of pollution.

Question. How does fletcherizing affect the use of tobacco?

Mr. Fletcher: I am glad you asked that question. I was a smoker at the time I took up my study of this subject twelve years ago and for some five or six years after I continued the smoking with less of a craving and more enjoyment of it, with less craving but more enjoyment, but about five years ago the desire sloughed off and I have not smoked since. Now we all know that the acme of enjoyment is not wanting, but in regard to food the growing appetite may be agreeable. The gratification of the appetite at a well fixed supplied table may be agreeable but the real enjoyment is the complete satisfaction or in other words the not wanting anything, so when I speak about smoking and about the use of tobacco I enjoyed it with the abnormal appetite. That is one thing I learned with the Philistines, but I enjoyed not smoking so much more that there is no desire to return (applause).

Dr. Kellogg: I am sure we do not want to go away without thanking Mr. Fletcher for this delightful address to which we have listened. If you look over to this beautiful picture on the wall, the gift of Mrs. Senator Henderson, of Washington, who is a very diligent fletcherizer, you will see where Mr. Fletcher lives. I told you about ten years ago he retired from business. He had wealth enough to take care of him for life and he retired to a beautiful home on the Grand Canal, a little ways from the scene you see there, with his wife and his accomplished daughter and his delightful grandchildren. He went home only a few weeks ago and he turned about and came back to this country in this inclement season. He travels from town to town at his own expense, at his own cost, and he has spent to my certain knowledge more than Fifty Thousand Dollars in this campaign in the last twelve years. What for? Not for peace and quiet and well earned retirement which he desires and might enjoy and has a perfect right to and has an opportunity to enjoy, but to educate American heathen in civilized ways of life, and I certainly think we ought to give him a hearty vote of thanks. As soon as I heard that he had arrived in America I wrote him and gave him a cordial invitation to come. I thought I should have to write to him twenty times more or less to get him here and I was really almost out of breath this morning to find he was here already. I suppose he came here to see whether we were fletcherizing or not and I was really glad we had that big sign up in the dining room. I want you to know that a man who thinks that it is worth while to give the best part of his life, the years of his life that he has set aside to have a good time, to enjoy the harvest time of his life, a man who thinks it is worth while to use that time of the closing years of his life in hard work, the hardest work he has ever done in his life perhaps, to help other people for only the reward of the satisfaction of knowing he is going to do some good, I think we ought to remember it at least. How many of you are going to begin to fletcherize? Hands up. All right I see all the hands are up, so you must

begin to practice it. Now I want to know if you have a vote of thanks for Mr. Fletcher.

Voice: I move him a vote of thanks.

Voice: I second the motion.

Dr. Kellogg: It is moved and seconded that we express to Mr. Fletcher our hearty vote of thanks for his delightful address. All who are in favor of this motion stand. The vote is unanimous.

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CONSTIPATION

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

Thursday, December 3, 1908, at 8:00 P.M.

by J. H. Kellogg, M.D.

The alimentary canal is about 30 feet long, the stomach about 5 feet long, leaving 23 or 24 feet for the small intestine. This small intestine is the great digestive organ. It is here that the great part of the work of digestion is performed. The stomach is an antechamber for the digestive process. It is that part of the digestive apparatus in which the food is prepared for the more complete process which takes place in the small intestine. In the stomach the food is reduced to liquid form. The mouth is supposed to do this work of reducing the food to a liquid so far as possible, but it is only mechanical--the work^K of the mouth. ~~Itxxxxx~~ The mixing of saliva with the food and the thorough , the thorough masticating of food is done in the mouth. Saliva and gastric juice both act on the food. The saliva dissolves the starch, converts it into sugar, into maltose, then after this work is completed the gastric juice begins its work and converts the protein into peptone; in other words, dissolves the other digestible elements of the food.

Perhaps I ought to stop right here a moment to consider what the process of digestion is. There are five digestible elements--starch, albumin, fats, sugar and salts. By sugar we mean cane sugar, malt sugar and milk sugar. These are the three kinds of sugar. There are several other kinds but these are the three principal kinds of sugar. Starch, Albumin, fats, sugar and salts--food is not simple you see. It is compound. There are different elements in foods, the most abundant of which is starch. The most important perhaps is the albumin or protein and another important element is the fat.

Then we have the sugar and the salts. Sugar is very closely allied to starch because starch by the process of digestion is converted into sugar. Sugar is in the process of plant growth found first in the form of starch. Then the starch is some of it converted back into sugar again. For instance in the maple tree in the winter time the carbohydrates are stored up in the roots of the trees and in the springtime under the influence of the warmth and the sun this starch is converted into sugar and is passed up into the tree to be made into ~~the~~ buds, twigs, bark and leaves, and the farmer cuts a hole in the tree or bores a hole in it and steals this sap out and then boils it down and makes maple sugar. The same way in sugar cane, the sugar is on the way up to be converted into starch in the seed of the sugar cane, and the same thing is true of the corn. The sugar in the sweet corn when the corn is right for roasting has not yet been converted into starch, so it is very sweet. As the sweet corn gets very ripe it is not very sweet but at the ordinary time for getting roasting ears the sugar has not yet been converted into starch.

Now in the presence of digestion this starch that was made from sugar originally is converted back into sugar as we shall see. There are five food elements, as I said,--fats, albumins, sugar and salts and starch. There are five digestive organs so there are just as many digestive organs as we have food elements, one for each one, but they are not arranged in the same order however--the mouth, the stomach, the liver, the pancreas and the intestines, these are the five great digestive organs, the mouth, the stomach, the liver, the pancreas or the abdominal sweetbread, and the intestines. Then there are five digestive fluids, so we have five digestive food elements, five digestive organs and five digestive fluids. The mouth makes saliva, the stomach makes gastric juice, the liver makes bile, the pancreas makes

pancreatic juice, and the intestines make intestinal juice. Each digestive organ makes a digestive juice, so there are five digestible food elements, five digestive organs and five digestive fluids. The mouth makes saliva, the stomach ~~xxxx~~ makes gastric juice, the liver makes bile, the pancreas makes pancreatic juice and the intestines make intestinal juice. Now we have the whole thing so far as apparatus ~~xi~~ is concerned. Now you see what the several fluids are ~~xxx~~ and the several food elements. The saliva converts starch into sugar, the digestible starch. The first digestible food element is starch. The saliva is the first digestive fluid and begins its work in the mouth, the first digestive organ. It converts starch into sugar. Now the gastric juice converts albumin into ~~peptone~~ peptone and the bile digests fat. Now there are three great important food elements--starch albumin and fats. These are the three most important ones. The saliva digests starch. The gastric juice digests albumin, the bile digests fat. Now what does the saliva do? It digests starch. The gastric juice digests albumin and what does the bile do? It digests fat. Now we have got all of the important digestible food elements digested and we have got some left to spare. Here is the pancreatic juice. What does it do? The pancreatic juice reviews the work. It does just what the saliva does. It digests starch. It does just what the gastric juice does, digests albumin. It does exactly what the bile does; it digests fat. So the pancreatic juice is the most wonderful of all the fluids. It digests all the different food elements--starch, albumin and fats. That is interesting isn't it. And intestinal juice has one office to perform; it digests ~~saxax~~ sugar--cane sugar. The intestinal juice digests cane sugar. It does a little perhaps to some of the other digestible elements but not very much, so little that it is hardly worth noticing. All the different digestive fluids digest salts. The gastric juice digests those salts which are capable of solution in an acid medium and the others digest those salts which are capable of

digestion in an alkaline medium. The saliva is an alkaline fluid, the gastric juice an acid fluid. The bile comes next and it is an alkaline fluid, so we have this alternation, the alkaline first, then the acid and then alkaline again.

Now we are going to talk tonight particularly about the intestinal digestion, but before we can understand that we must ^{know} ~~note~~ a few things more about the stomach. The saliva does not do this work in the mouth alone. It takes the saliva 30 or 40 minutes to do its work upon the food and no one would want to hold a morsel of bread in the mouth twenty minutes or 15 minutes. Even Mr. Fletcher would get tired of that I am sure. After the gastric juice has been secreted after 30 or 40 minutes when the stomach contents become quite decidedly acid with the gastric juice then the work of the saliva ceases. At any rate it ceases upon the outer mass of the food and the albumin begins to be digested. Here is a mass of food made up of starch and albumin. The albumin is in the form of fine mesh work, threads of mesh work and the starch lies in between, so when the starch is acted upon by the saliva and the albumin is melted down by the gastric juice you can readily see that the whole mass is reduced to a liquid state, and that is what happens in the stomach, so the food is thoroughly prepared in the stomach for the action of the bile, the pancreatic juice and the other digestive juices in the intestine which perform the real work of digestion.

Another work which the stomach does and which is very important is to disinfect the food. Prof. Pasteur you know was the real discoverer of germs. At any rate he discovered the great office and function of germs. He became

attached to germs I think. At any rate he attached very great importance to them and he considered germs very necessary^{to} animal and vegetable life. Indeed he went so far as to state it would be impossible for animals or vegetables to live without germs; that germs were essential to life of all forms. One of his students, Professor Roux, questioned this and he proved the professor was mistaken by raising some beans in sterile soil. He took some earth, sterilized it by baking so that the germs were all dead and he planted some beans in this soil, kept all the germs away and watered the beans with sterile water and the beans grew and flourished and Professor Pasteur was obliged to admit that germs were not necessary for the growth of vegetables but he said ~~xxxxxxx~~, "I still insist that germs are necessary for the growth of ~~vegetables~~ animals." Finding germs so abundant in animals, particularly in the alimentary canal, the professor had arrived at the conclusion that they were necessary, but Professors Nuttal and Thierfelder, two other investigators, made a very interesting experiment with some guinea pigs by which the guinea pigs were brought into the world under conditions so that they remained sterile. They were brought into the world by means of a surgical operation and were kept absolutely sterile, and they grew and thrived and flourished without germs.

For myself I never believed germs were necessary for the development of human beings. I used to discuss this matter very often with bacteriologists whom I used to meet on the Michigan State Board of Health some 20 years ago when I served on the Board for 12 years. I met there a bacteriologist who was a very enthusiastic believer in the beneficial work of germs in the body as an aid to digestion. ~~Im~~ said one day to the professor, "Suppose a baby had the misfortune to be born on a mountain-top must it die for lack of germs?" The professor was hardly prepared to say that baby would certainly die, but

still he thought they were necessary. We will tell you more perhaps about that a little later. .

Now we want to study from the bacterial standpoint a little about the anatomy and we shall learn a little of the physiology as we go along of these important organs . First, the position of the digestive organs and the organs of the trunk. This shows the body ~~skoutx~~ pictured in such a way that we see the organs through the ribs, in the open spaces between the ribs, so we can see their relation to the ribs. Here is the lowest rib, the floating rib you see. There are the seven true ribs, then there are the three other ribs which are called false ribs, and the two floating ribs. Here are the three false ribs and here the floating ribs. These lowermost ribs you see fall in a line which marks the lower border of the colon and the stomach lies at considerable distance above you see on a level with the middle floating rib.

Now here is the liver you see lying upon the right side and its lower border is some distance above the lower border of the ribs. The edge of the liver projects out just a little higher up, a little beyond the ribs. This shows the normal position of the viscera. Here on the other diagram you see the position of the viscera when the clothing has been worn tight. I suppose this man wore a belt or something so that the organs were crowded down out of place. You see a great number of people going around with their stomachs hanging ~~xxxx~~ away down here, dangling about, but now we will see some more of these viscera.

This gives a better view of the liver and here is the stomach and colon you see. The colon is right close to the stomach. Here is the gall bladder peeking out from this corner of the liver. Here is the ascending colon, the cecum, the transverse colon, the descending colon, the sigmoid flexure

or S-shaped flexure, and you notice this left splenic flexure as it is called ~~xxxx~~ comes clear up to the diaphragm away up to this point and is fastened there and this corner is also fastened here. A great many people have pains in the right side and pains in the left side that they think ⁱⁿ must be the liver, kidney ~~or something~~ or something of that sort. It is generally due to an extra strain upon this attached portion of the colon. It is loaded down. The colon is perhaps dragging down and it makes a strain upon that attached part of the colon, so there is naturally pain there. This gives you an idea of the circulation, the blood supply and general appearance of the viscera. The liver has been turned up so we can see the underside of it and the stomach also, so we can see the underside of it.

I saw a stomach just like that yesterday and it had been obstructed right here. I found it necessary to take the small intestine here, bring it up, attach it to the underside right at that point there so the food could pass out of the stomach, pass on into the lower organs. I saw this yesterday also. It looked just like this, exactly like you see it here, these great blood vessels and the fat, a little more yellow than it appears here, having the appearance of an apron hanging down in front of the other organs--one of the most wonderful organs in the body. It looks like nothing at all but a fatty membrane but it has marvelous functions. In this man's case an ulcer had formed right here, made an ~~xxxxxxxxxxxx~~ obstruction in the stomach, almost perforated the stomach. In fact I think it had perforated it because there was a little constriction like a puckering string drawn around this point, and this lower portion of the omentum had turned up and made a patch to keep the stomach contents from passing out into the abdominal cavity. That is what had saved that man's life. The only thing in the

world that saved his life was that this wonderful organ, the omentum, had turned itself upward, tied itself to that weak spot and formed a patch and the man's life had been saved. Whenever we find an inflammation going on anywhere in the body this curious apron that looks like nothing in the world ~~is~~ *but* membrane creeps about finding that spot where the inflammation is going on and applies itself to that weak spot. For instance, when a man is getting appendicitis, has pain in this region, you can ~~always~~ almost feel this omentum creeping down there ~~and~~ to protect that appendix. When we find the appendix inflamed we almost always find the omentum there wrapped all around it. That is the reason why people do not die more often from appendicitis ⁱ than they do because this omentum takes care of it. Physicians speak of this membrane as the abdominal doctor because there is not a man on the face of the earth who has anything like the skill and intelligence that that little omentum membrane has because it is so actively engaged in protecting the body from mischief. That is one of the most marvelous functions in the body.

Here is a view of the liver turned over so we can see the underside of it and you see the different lobes, the right lobe, the left lobe--the lobulus spigelius and the lobulus quadratus. These different lobes are of interest because they are affected in different ways, sometimes becoming diseased independently.

Here is the gall bladder. Here are these great blood vessels, the inferior vena cava which brings blood up to the underside of the heart, and here is this great umbilical vein ~~g~~. Here is the portal vein which gets together all the blood from the stomach and intestines and all the organs of the abdomen. The blood from these organs is all directly in this portal vein and carried to the liver, distributed through the liver to be inspected, to be purified, to be acted upon by the liver, before the blood is permitted to pass on to the rest of the body.

Now here is still another view of these organs showing them in a more natural way. This is the way the liver lies and this is the way the stomach is found in its normal position. The liver is concave on the other side you see and the colon and the other organs fit right up under here. The kidney fits up under here and the colon lies up under here. The stomach also adapts itself to this underside of the liver.

Here is the gall bladder. Here is the stomach, a different shape from what you supposed it had, I presume. The greater part of the stomach is vertical. Here is the cardiac portion and here is the pyloric portion and here is the duodenum and here the small intestine begins. Here is the pancreas which lies behind the stomach. Here is the spleen. Here we have still another view of the stomach and the liver and the gall bladder, each one in a somewhat different way. From these different views you get an idea how they look.

Every animal has its own stomach. No other animal has a stomach just like man's except the monkey, the gorilla, chimpanzee and orang-outang which have stomachs so nearly like those of human beings that they could not be distinguished from them. They are practically the same thing. Now for instance here is the human alimentary canal of a cow. We have one cavity here, one pouch, but the cow has four. Here are four organs each of which has its particular functions to perform. Here is the alimentary canal of a rat. A muskrat has this secondary stomach very largely developed. Here is the stomach of a ~~porpoise~~ porpoise. Here are other stomachs of other animals which are too complicated to consider. Different orders of insects have remarkably complicated stomachs. This shows a better view of the colon and something of the small intestine. Here is the small intestine laid aside so we can see these great vessels, the aorta and these

large vessels that supply the different parts of the colon.

Here is the ascending colon, the transverse colon ~~making~~, the pancreas behind the descending colon. This looks very much more natural. This is the omentum which looks here almost as it does in life. Here is a picture which shows the cecum, the appendix, and small intestine laid out to one side, and here is the jejunum. Here is where it comes down from above and this is the very point at which it is attached to the stomach. In the operation I did yesterday I just took a little loop at that point there, attached it to the underside of the stomach and the patient is getting along very comfortably. This gives an idea of the sympathetic nerves by which the intestines are controlled. The sympathetic ganglia running down the front of the spinal column, not in the spine but in front of it, into the abdominal cavity, running ~~down~~ ^{along} down here and sending out their branches to the heart to the liver and to the stomach. See what an enormous number of branches go to all these different organs and following the blood vessels wherever they go throughout the body so you can readily see how it is the heart is likely to be disturbed when the stomach is out of order because these sympathetic ganglia that associate these organs together supply the heart and the stomach and the lungs. You very often find people coughing and suffering from asthma because of disturbance in the stomach. You can see how disturbance of the colon here might have an effect on the entire body, how we might have headache for example from a disordered stomach, pain in the back, pain in the shoulder. I met a gentleman this evening, for instance, who had a pain in the back of his neck and was very much disturbed about it. I didn't have any hesitancy in telling him he was going to make a good recovery. I found he didn't have any cervical vertebrae out of ~~the~~ joint, didn't have any diseased condition there, and it was simply a referred pain. That means there is something wrong with the

viscera, the stomach bowels or some other of the internal organs, and whenever that is corrected this difficulty disappears. Pain between the shoulders generally means a congested state of the liver or stomach.

Pain in the shoulder blades nearly always means some trouble with the liver or gall bladder or colon perhaps. Pain lower down almost always means trouble with the colon or intestine, generally the colon, and pain in the side is more often caused by the colon than any other cause.

Here we have a better view of the pancreas. Here is the spleen over here. Here is the right kidney. Here is where the intestine curves around the head of the pancreas. Here is where the intestine is attached to the stomach. Here is where it is attached to the jejunum. Here is the gall bladder, showing how it is connected with the intestine. The gall bladder, the stomach and the pancreas come in together at the same point right here and empty their digestive fluid into the intestine at this point. This shows the duct, bladder here is the gall ~~bladder~~ duct and here is the duct from the pancreas running in together into the intestine as shown by these dotted lines here. All of these places are subject to disease. You see how people get pancreatic disease sometimes from gastric disease. A person has a diseased condition of the stomach. The gastric juice rapidly disappears from overwork so the gastric juice is no longer able to destroy germs and disinfect the stomach and consequently the germs grow in the stomach and the person gets catarrh of the stomach and by and by this catarrh drifts down the duodenum here and this becomes the seat of catarrh and then the catarrhal condition works up here into the ductus communis choledochus, then sometimes into the liver and the patient begins to suffer from jaundice, and this swollen congested condition of the duct closes up its opening and the bile works back into the pancreas and the pancreas becomes the seat of disease, becomes infected, to

so the pancreatic juice is not properly produced and the pancreas is disturbed in other ways and by and by diabetes makes its appearance, or inflammation of the pancreas, or abscess of the pancreas. I found a man sometime ago who had a great bunch projecting into the abdomen here and we found it was a piece of pancreas which had actually sloughed off and it was discharged and the patient made a good recovery, but the result is not usually so fortunate.

This is a picture of the intestine showing the enormous blood vessels distributed through just a little section of the intestine. This shows what an enormous number of large blood vessels are connected with the intestines. These vessels of the intestine are so large and have such great capacity that they are capable of holding all the blood in the body. All the blood in the body may be gathered into the intestines. That is what happens when a person faints away. When a lady faints away in church it is because the blood has all run away into the abdomen. That is the reason why a person is quickly rallied from fainting by putting them on the floor ~~into~~ a horizontal position. The blood runs back into the head you see, and the more nearly you can get the person standing on his head when he faints away the quicker he will come to. The best way is to bend down as low as possible and that will compress the abdomen and force the blood back into the head more quickly than anything else.

This intestine is one of the most wonderful of all the structures in the body. I have told you about the wonderful omentum. We think of the intestine as simply a squirming tube. I think of the intestine almost as something independent of the body. I think of it as something that has a life by itself, like a great serpent acting as a servant to the body, rendering useful functions. One of the most wonderful things which the

intestine does is a thing discovered by Professor Roger, of Paris, an eminent pupil of the great Professor Bouchard who discovered all about intestinal auto-intoxication some years ago. Suppose a child swallows a small pin and it gets down into the intestine. There it is sticking into the wall of the intestine. What is there to hinder it going right straight through the wall? but there is not the least bit of danger at all that any harm will come from that pin. The child will get along all right. Let me show you why. The intestine knows what has happened and it immediately prepares for the emergency. There is the pin sticking in, and as soon as it begins to stick in the intestine begins to thicken on that side so the pin won't get through. Then something else happens; it makes a little bunch in front. It contracts in front and contracts behind and pushes up against the pin and by and by pushes the pin up into a vertical position and keeps on until it pushes the pin clear over like that, then it lets go and the pin goes on down through the intestine head foremost and there is no harm done at all. Everything is safe. That is not a theory or a fancy at all. That is exactly what the intestine does and it does it every time. When anything with a sharp point is put into the intestine it proceeds at once to handle it so that no harm comes from it. I mention this here simply to show you what intelligence the intestine has. It is not a mere process of solution going on in the alimentary canal but it is a process that requires wonderful intelligence all the while. The food is closely watched from the moment it leaves the mouth at the back of the throat until its work is ended in the colon, the great spacious reservoir where absorption takes place. The food is under intelligent inspection and controlled and watched every moment by most intelligent care. It is only when we violate some of the laws of

health making conditions such that it is thoroughly impossible for normal work to be done that anything goes wrong. Under ordinary conditions everything goes right in this wonderful transformation, or transfiguration I like to call it because it is most wonderfully like a transfiguration when we think of the bread and the apples and the potatoes that we eat, when we take these things into our bodies and they are by this marvelous process going on in the intestines converted into blood and from blood into tissue, so that what we eat today is tomorrow walking about and talking, creating and doing things. I assure you my friends that this transformation of food into living bodies and into thoughts and acts is the most wonderful thing that we come in contact with in our daily experience.

Now here is a picture that is intended to give something of an idea of what is going on in the alimentary canal during this process of transformation. This is a picture of a cat. Mr. Horace Fletcher told you when he was here about the experiments of Professor Cannon of Harvard, how he had a cat swallow some bismuth along with milk so the work of the intestine became visible because bismuth is visible under the X-ray. The cat is transparent under the X-ray while bismuth is opaque so we can see what the bismuth is doing. This shows some bismuth after the cat had swallowed it. You see here is the little loops of the cat's intestines and by watching the cat constantly the professor was able to learn many wonderful things in relation to the process of peristalsis which is one of the very interesting things that there had been little known about before. This shows the intestine uncontracted and the professor observed that the intestine contracts in ~~skat~~ sections, which contracted here and contracted there leaving an open space between. The intestine divides itself into sections and contracts all along the line in alternate sections. This picture shows these sections contracted. This line shows how that section joins this section over here and the contraction

occurs next at this point, then a moment after it is contracted again at this point, so this section joins here and that section becomes a part of this, that is, a part of this comes here and a part of that goes there and in that way the food is pushed along. It is not a contraction occurring at one point that travels along like a wave in that way, as we formerly supposed but it is a contraction all along the line, and the food by this means moves along all at the same time. It all moves along at each contraction. Along the whole course of the alimentary canal the food moves. Whenever this contraction occurs that is the way it should do.

Now it is found that this process occupies different times. It goes on ^{at} ~~in~~ different rates in different parts of the alimentary canal. For example, from the stomach to the cecum occupies seven hours. Then after the foodstuff reaches the cecum, that large capacious outlet of the lower portion of the intestine, it remains there 14 hours and does not move at all, that is, in the cecum and the ascending colon it remains 14 hours. That is so absorption may take place. Then three hours more are occupied in moving the food remnants after all the useful parts have been absorbed along the remaining portion of the ~~alimentary~~ alimentary canal, the transverse colon, the descending colon, the sigmoid flexure, the rectum and so out of the body.

Here we have something that looks very amusing. some years ago I was showing a picture like this through a microscope to a lady and she says,

"What are these?"

"Germs", I said, "Germs."

She said, "How big are they?"

I said, "If 20,000 were arranged in a row the row would be an inch long."

"Oh, I am not afraid of these little fellows."

These little fellows are only dangerous because of their number and

because of the wonderful rapidity with which they grow and because of the terrible poisons which they produce which are among the most deadly poisons known to man, some of them, not all of them. They are extremely minute but they can grow with enormous rapidity. For instance, one germ doubles every 15 minutes, and continue that process and think how many there would be in 96 doublings. There would be some million of millions of millions of millions. You would have to go up to 9 or 10 periods of ciphers to write the number of bacteria which would be produced and the space which they would occupy. One twenty-thousandth of an inch thick in cubic contents, one twenty-thousandth of an inch in size, you can easily estimate how much that would be, one with ten periods of ciphers attached representing the number of germs, so you see it would amount to some cubic miles, the number of germs produced in 24 hours from a single germ at that rate, but they never do that because germs require food and they cannot get food enough to grow so fast and besides that they manufacture poisons which are deadly to the germs themselves and that is another protection which we enjoy, but with such marvelous capacity for growth ~~and~~ the wonder is we live at all. The only reason that we do live is that we have power for fighting germs. We have power for combating them; we have capacity for dealing with their poisons. We have in our body certain organs the purpose of which is to destroy these poisons. The liver is one germ-destroying agent which kills germs which are found in the blood. The mucous membrane in the intestine is another organ that fights germs and germ poisons, the thyroid gland is another, the suprarenal capsules another, the pineal gland of the brain is another, and every lymphatic gland in the body is a poison-destroying organ, a germ fighting organ .

These are different kinds of germs found in the intestine. These are typhoid fever germs, the germs which produce typhoid fever. Without these germs you could have no such thing as typhoid fever. They get into the stomach and there is active gastric juice there. The gastric juice destroys them and they do no harm. A person who has strong gastric juice in his stomach can drink any kind of water without getting any harm. That is why everybody does not get typhoid fever in an outbreak because some people can digest typhoid fever germs. If you have got a good strong stomach you don't have to be afraid of typhoid fever germs but if you have ~~hypaxixixix~~ hypopepsia, hypochlorhydria, then you had better be looking out for typhoid fever germs. You cannot afford to risk it. When you go through Chicago you must be careful not to drink any Chicago water for there are always typhoid fever germs in Chicago water. Don't drink any kind of water which comes from natural sources. Never drink any ~~kixix~~ water which comes from ~~ixax~~ lakes, rivers or natural sources of that kind because such water is almost always certain to contain some of these dangerous germs. If not typhoid fever germs some other germs.

Here is another picture of typhoid fever germs which shows you a more magnified appearance, how they appear under high magnifying power. They have a great number of little appendages and these appendages are in constant motion so typhoid fever germs are able to travel about. You see they look very much like devilfish, like an octopus. Here is one and here is another. Everyone of these is a typhoid fever germ that has multiple legs and these legs are in constant motion so that they are able to swim about and you think they are animals when looking at them but they are not. They are vegetables.

Here is a picture which shows how we used to study the intestine and the stomach years ago before we had better means. We used to have to put something into the stomach and then dilate it to see how large it was. Then we would ~~peruss~~ ^{peruss} it and find out where it was, put water into it and splash the water about, feel the movement of the water and in that way we were able to determine the lower border. This shows in this case where the lower border of the stomach was and this shows where the colon was. This shows how the stomach was extended from that point to this point, an enormously extended stomach, and the colon was just down beneath it, but now we have better means. If we have a person swallow some yogurt buttermilk or ordinary milk with some subnitrate of bismuth along with it and then examine the patient with the X-ray or take a photograph of the X-ray we can see just where the stomach is. This shows a picture taken in this way just the other day. This was the appearance of a normal stomach that has not yet lost its motility, the muscles of which are still able to contract, and it shows how the stomach has contracted here. The stomach is contracted upon its contents and this represents the contents upon which the stomach is contracted. The stomach is not a flabby sack. This is the pyloric portion where it turns up to join the small intestine. This is the prepyloric valve where the foodstuff comes down and as it is liquified it passes into the pyloric portion where it ~~xxxxxxx~~ is forced through just as the bulb of a syringe may be contracted, and forces the contents--liquid contents--on in the same way. In this case the patient's abdominal walls had lost the power to support the abdominal viscera and you see at once ~~xxxxx~~ here is the real cause of enteroptosis, because people suffer so much when they are on their feet, so they must have something to hold them together. That is why so many ladies cannot get along without their corset laced up tight because

things are ~~malapassdxxx~~ jostling about you see, jostling all around and they need something to hold them together, and you see the importance of developing these muscles so they will be able to perform their duty, holding the organs up in the proper place.

You can actually see the stomach and know where it is. This shows a diseased condition, a tumor or a cancer of some kind, and we are able to discover the facts, so we are not so much in the dark as we once were in relation to gastric disorders.

This is a diagram showing the colon and its relation to the skeleton. Here are the hip bones you see up here and here is the cecum lying at this point. Here is the appendix, the ascending colon, the sigmoid flexure and the rectum. This represents a little operation^{er} that has been devised by Doctor Lane of London, one of the leading surgeons in one of the large hospitals there. Here is where the small intestine enters the cecum. Dr. Lane, in order to relieve patients suffering greatly from intestinal auto-intoxication where the colon becomes a sack and is no longer able to contract upon itself so as to carry its contents onward as it ought, conceived the idea of attaching the small intestine at this point you see so the food would not have to pass this long way around but would simply pass this short distance or a short cut you see, like cutting out a bend of the Mississippi River by one of our great generals in the war.

Dr. Lane not only makes this attachment here but he connects it in here so the food passes down this way. I remember very well a case upon whom I performed this operation a few years ago, a woman whose skin was yellow as leather, tan color, a lady about 45 years of age who came here with her daughter who had a very remarkably white skin while she herself had never had a natural movement of the bowels since she was a girl. She

She could not remember any time in her life when her bowels had moved without medicine, not once. The daughter was a tall, well developed young woman and there was a great contrast between her and her mother. You wouldn't hardly think they belonged to the same family. We had not yet learned of the use of yogurt, colax and some of other things we are now using in treating this class of cases. I was in despair. We had used all the means we knew of at that time. We had used the old fashioned ~~skatixx~~ enema, electricity and all those things and they had all failed in certain cases and in this case they apparently did no good whatever. This woman was suffering constantly from headaches and was in a most wretched condition so I performed this operation, cutting off the intestine here, so it could not make any further trouble and there ^{was} a most wonderful transformation in that woman. The bowels moved the next morning after the operation and regularly two or three times a day from that time on. In three weeks she had bleached out so that she was the same color as her daughter, had a handsome skin and she went home and has remained now for two years in excellent health.

Dr. Lane, who had a very extended experience in this operation found that sometimes the intestine ^l contents would back up into this blind portion of the intestine, and there being no circulation around this way, the circulation being from the intestine down this way, he found sometimes it would back up there and make trouble, so he began gradually cutting off this intestine. I saw him in London about a year and a half ago remove all this part of the colon, cut it off there. I said, "Doctor you are cutting off so much of it, why not cut off the rest of it?" He said, "I believe I will." I had a letter from him a little while ago saying he was cutting it all off. I was quite persuaded I would have to do some of these operations myself but I have not had to resort to that operation and I don't ever expect to have to do

it because we have found other and better means. The wonderful discoveries of Metchnikoff and of Combe and of Tissier and others have ~~has~~ put us in possession of means by which this operation can be avoided and I am very glad for if there is anybody in the world who dislikes surgery it is myself. I never do surgical operations when it can possibly be avoided. When the colon becomes distended and the contents come down here and lodge in the colon and remain there it is dragged down here, clear down to the very bottom of the pelvis, lying ~~down~~ down on the rectum. Many a person suffering in this way is constantly distressed with a nagging sensation as though there was something in the rectum which should be discharged from the body when it is in the cecum instead. The pressure comes from accumulations in the cecum. Not infrequently I have found the cecum just in this position sometimes lying clear over here in fact, and not infrequently I would find the appendix would be inflamed and adherent away up here and the cecum would be projecting away on beyond it because of chronic inflammation.

Here is the transverse colon you see that should be passing across here arched upward, but you see it is concave. It is collapsed. Why? Because it is elongated, and the whole intestine when it becomes distended is elongated also and so has to fall upon itself in order that there shall be room for it. See what happens here in these angles. Instead of having a broad opening so the contents can pass around in that way it is cramped and stricture often occurs at that point so that whenever there is material passing around this angle here it causes pain and the patient often complains that a few hours after eating he feels pain or shortly before movement of the bowels there is pain upon the left side. That is because of the fecal contents passing around through this narrow opening. It often amounts to

a stricture, so there is a mechanical obstruction to the movements of the intestine.

Here is another case of deformity. Here is an enormously enlarged caecum, a prolapsed transverse colon and other deformities. Here is still another one. I have found several cases just like this, one just the other day in which the transverse colon was so elongated it laid away down here. This portion is narrowed at the angle here, then there is an accumulation, an enormous accumulation. Here we have the same condition only worse, but now I see it is 9 o'clock and I will finish this subject next time and I will tell you what happens when these cases occur and what are the causes of intestinal inactivity, of intestinal indigestion, one of which is constipation, another form colitis, and others which are so common as to be almost universal among civilized people, and I will tell you the proper cures, some of the causes and the cure. I think it is important that everybody should know something about it.
