

Health Training.

A Stereopticon Lecture at the Sanitarium

Parlour, Battle Creek, Michigan, Thursday, October 15,

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by

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I have just been over to the Annex talking to some Presbyterian preachers. I told them a story a Methodist clergyman told me. The circumstances happened to a friend of his. A friend of his was talking to some boys in school and he wanted to impress those boys with the importance of Methodist preachers to the world, and he chose for his text:

"Ye are the salt of the earth."

And he wanted the boys to understand that Methodist preachers were especially referred to in that text. So he began with talking about salt. What is salt? And they all knew what salt was. "Now what is salt for" he said to the ~~many~~ boys." And they all said together, "To keep good victuals from spoiling." It went on for sometime and he explained that Methodist preachers were doing so much for the world to keep the world from spoiling and make it better. "Now boys, will you all tell me together what our Methodist preacher is for." And they all shouted out at once, "To keep good victuals from spoiling." I tried to convince those people that it was their duty to take hold to help the campaign for race betterment; that if anybody is going to keep the world from spoiling, it is the duty of the preachers to do their part, for that really is their proper job. Doctors, I suppose to make their living by helping people who are already sick, and the sicker the people are, the better for the doctors, of course, the more business. So it naturally would not be expected that doctors would be the only ones who would be especially interested in helping to prevent sickness.

Now I am going to talk to you tonight on a continuation of what I was saying a week ago tonight, about how the body resists disease. Now I propose to

talk about health training. When you talk about health culture, the idea which is generally received, is that health culture means some sort of gymnastics, living out of doors, going fishing or hunting or doing something to cultivate ~~the~~ and develop the ~~body~~ body and that is all right. I do not mean to say that hunting and fishing are all right. I don't believe in that, but the outdoor life and the general culture and development of the body, that is a part of health culture but it is not the whole thing. The foundation rule of this institution, the main thing we undertake to do for people here is through health culture, health training. The doctors found out long ago and the people found out much longer ago that medicines do not cure. I remember a story of a Irishman who called upon a doctor and the doctor gave him something and said to him, "Take this home and take one of these pills three times a day." And he took the medicine home and his wife persuaded him not to take it, but to give it to the dog and he gave it to the dog and the dog promptly died. He met the doctor on the street a few weeks later and the doctor asked him, "Well How are you getting along?" "Well," he said, "I am fine sir, but the dog is dead." And some of you perhaps remember of a cholera outbreak in Staines some years ago when people were dying very fast in the community, and they finally made up their mind that the doctors had poisoned the wells in order to make business for themselves. It was a most outrageous suggestion, for doctors never do things of that sort at least, so the people ^{each one} ~~had~~ had received different medicine. The doctor in his desperation had been giving everybody something new for they were all dying so he gave everybody a new kind of medicine. He tried a new thing for each new patient and these patients or their friends, their survivors came together in a great group to this doctor's house and they made him swallow something out of every bottle and the doctor promptly died, at least so the newspaper said. Now I don't mean to say that doctors purposely, maliciously poison people, far from it. There is no profession in the world that gives so much gratuitous effort to the world as doctors do. If a doctor hears of a ~~man~~ sick baby ten miles off and he knows he will never get a dollar. He will get up in the middle of the night when he is half dead for want of sleep, harness his horse, get out

his carriage and ride through the stormiest, coldest winter night to help save that baby's life. Thousands of doctors are doing that sort of thing all the time, so there is no class of men in the world that give more time freely and generously than the doctors do. But the world and the doctors are perhaps chiefly to blame for it. The idea that drugs cure! Now it is not the fault of the doctors, it is not the fault of the profession that this idea has prevailed, because it is an idea that was handed down to us from ancient time and it is one of the old sanctions that it is our duty to get rid of the worst slavery in the whole world, and the worst slavery that ever was, my friends, is the slavery of men to preconceive pre-established opinion, to well establish opinions. We must not differ from them. The doctors have had this idea perhaps more strongly than almost anybody else, no not quite as bad as the lawyers, the lawyers have it so terribly bad, I don't think they will ever get over it.

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If you ask a lawyer his opinion on any legal question he won't give it to you straight away. He has somebody go and look up and see what somebody thought about it, to see the established opinion about that thing. Then he will report to you in a brief and charge you twenty-five or fifty-one hundred dollars so with clergymen; in recent years clergymen have been breaking away from the old ideas and the old theological notions are going to the wall very fast, too fast I am afraid; so with doctors. Doctors have been getting light and light first came up from the laity. The people who were the victims, we may say, in a certain way of the doctors' mistakes and of the errors of the medical profession, have seen light first of all. The great reforms that have been made in medicine until very recent times have come from the laity. It was the laity, the common people, that first discovered that water was a valuable remedy so it was one of Nature's most important and most potent remedies. It has taken more than 100 years for doctors to begin to appreciate water and they do not appreciate it yet. The scientific use of water began more than 100 years ago with Dr. Currie in Liverpool and he wrote an admirable treatise upon the use of water. He was the first man who ever used a thermometer in the treatment of fever. John Hunter invented the medical thermometer and Dr. Currie of Liverpool was the first to use the medical thermometer in the treatment of fevers. It is very curious how water was first introduced in the treatment of fevers. A Dr. Jackson was a doctor in Jamaica for a while and while ^{there} he saw a great many people who had yellow fever. Yellow fever was rife there as it has been during ~~all~~ ^{all} the hundreds of years since but it is going to be blotted out after while. Thanks to the discoveries of recent times in relation to the cause of yellow fever. He noticed that when a native took sick with yellow fever his friends took him to the seacoast and took him on the sand and poured water over him. When he came back to England he came down with yellow fever himself ~~and~~ on shipboard, contracted the disease just before he left and he made the sailors draw buckets

of water with ropes from the sea and pour it over him as he lay upon the bed and he recovered so when he got to Liverpool he told the story of his recovery and of the treatment of fever by these untutored natives of Jamaica and Dr. Currie became very much interested in it. Scarlet fever was at that time very prevalent in Liverpool and Dr. Currie's own children came down with scarlet fever. He had no faith in the drugs that had been recommended and used for centuries for this disease. He had no faith. He knew they did no good so he treated his children with water. That was the first time I know of that civilized people had the advantage which the savages had been enjoying some time immemorial of having the natural treatment of fever with the natural remedy, water. His children recovered and made such splendid recovery and the observations which he made of the influence of the water when poured over their bodies upon the temperature were so very surprising and interesting and so wonderfully rational that he gave it out to the profession and he treated many cases of fever in that way and Dr. Rush of Philadelphia, one of America's greatest and most noted physicians, one of the signers of the Declaration of Independence, Dr. Rush made a trial of the same remedy in the treatment of yellow fever and with most excellent results and he used water in various other ways and a sort of water cure revival was started in the United States and physicians in different parts of the United States began the use of water and little water cures started up all about the country but they soon disappeared, not entirely, however. A few lingered on and this institution which was started almost fifty years ago was one of the later results of that idea created by the observations of Dr. Currie and Dr. Jackson. Something was due also to the work of Priessnitz, the Austrian peasant in Austrian Silesia, an ignorant man absolutely untutored who could not read or write living out there in the mountains far away from the center of civilization, he a sagacious observer noticed that water was useful in the treatment of animals. In fact, it seems the thing began in quite a romantic way. When he was a boy about ten years old one of the

travelling locksmiths came along. There was not enough business anywhere in any one center to keep a blacksmith or locksmith busy and as locks and hinges were made by locksmiths in those days, they used to travel through the country. This man in travelling through the country stopped at his father's house and it happened just at that time that one of the cattle in the fields, a valuable cow, had backed up against a sickle and cut the cords of her leg just above the hoof and the animal was really so badly crippled they thought they would have to kill it. This man said, "I have a magic by which I can cure it" but he would not allow anybody ^{to} see him do it but he allowed the little boy, Vincennes, to go along with him to carry a couple of sticks and a basin of water and some cloths. His father said to the boy, now notice very carefully the words that he says because he is going to repeat some magic words so the boy went along and carried the water and the sticks, etc., and the cow was found in the pasture and the towels were wet in water and wrapped about the cow's foot and the sticks were crossed over the bandage and then the magic words were said. The little boy took careful note of these words and when he went back repeated them to his grandfather and so the magic working locksmith went on. The boy's duty was to change these cloths every day and very carefully cross the sticks over the bandage after it had been made. Twice a day the cloths had to be taken off, re-wet and applied to the foot and the cow actually got well so there was great faith in the magic and the boy had learned the words so that people began coming around from all about to have their pigs treated and their dogs and cattle and horses and the boy began treating the horses and the cattle and pigs and many of them got well. He treated them by means of cloths dipped in cold water and repeated his magic words.

He treated them by means of cloths dipped in cold water and repeated his magic words. By and by people said, "This must be good for us as well for the pigs, horses, and the cows. In fact, the boy himself got hurt. One day when he was out hauling logs down the mountain side the horses ran away and a great log rolled upon him and crushed in his side and the doctor said his case was hopeless, that he would always be a cripple but the boy had seen the good effects from water so he dipped the cloths in water and laid them upon his side, wrapped them around his arm. and His ribs had been pulled out of place and he got hold of a chair and pulled his ribs into place and herocially went to work to heal himself and in the course of a few weeks he was well again. Then people began to flock around from all about and pretty soon there was a row of people in front of his father's log cabin every day waiting to be treated. The boy treated them in various ways and by and by he found that a sponge was more convenient than a wet cloth so he had already gotten the name of the boy with the magic work and that is what brought the people in there. Then he began to use the wet sponge instead of the cloth. The story I am telling you seems almost too romantic to be true, I expect to you, but I am quoting as nearly as I can directly from the life of this man, Vincennes Priessnitz, which is now published and I have it in my library. I think the story is true. The facts were gathered together while he was still alive and I have visited the place where he did his work and found so much of it true that I think it must all be true. In using the sponge he would dip a sponge in the water, say the magic words over it, then apply the water to the injured part. If a man had gout, for instance, he would make him sit

down in a chair and with a sponge he would drip the cold water over his foot and rub the toe where the trouble was for hours and in eight or ten hours it was declared that the very worst cases of acute gout would be brought to a successful issue so the boy very soon got the name throughout the whole country of the boy with the magic sponge. The doctors began to be very much incensed because people they had pronounced incurable and ready die, some of them went up to this boy's cabin and came back well. There was a good deal of commotion so it was sent out that the boy had an evil spirit, that he was using bright magic to cure people and so he was arrested. He was then grown up to be a young man and he was arrested, taken down to a neighboring village and put in jail. I saw the very place where he was incarcerated and visited the village. He was kept there for some little time. Finally, he was let out on the promise that he would no more use the magic words but he was allowed to use the magic sponge still. People thought the magic was in the sponge and it was years and years before the real fact came to the surface that the real magic was in the water and it was only after thousands and thousands of people were flocking every year to this ~~hospitel~~ humble place, sometimes as many as 1500 people at one time found their way to this little hamlet away up there in the mountains close to the border of Russia. People went from this country and from South America and from all over Europe and after while physicians began to travel to Graafenburg and various European Governments sent the surgeon-generals of their armies to learn about this simple method. The surgeon-general of France was sent over there and similar officers from various other countries. There was great opposition on the part of the medical profession. He was an ignorant peasant that was curing incurables and the people were flocking there from all over the world. Members of royal families went there, Lords and Ladies and people of high degree, and he was getting so famous that the opposition became very intense. Finally, the Austrian Parliament appointed a

committee to visit him and ascertain whether he was a charlatan or not and this committee brought back such a glowing account of this man's work and of his honesty, integrity and the reality of his cures that the Austrian Government issued him a special diploma permitting him to practice the art of using water so he had no further trouble with the doctors. Now that was really the way in which water became introduced into medical practice. Priessnitz did not discover it. Priessnitz simply, when he began to use water, after he got a little older, he found a great number of practices in common use among the people of that mountain region. He found that people who could not sleep had the habit of wetting their stockings and putting these wet stockings on and then putting dry woolen stockings over the ^{cotton} wet/stockings and going to bed and going to sleep. He found that was a common practice. He found people who had fevers were wrapped up in wet sheets. In fact, in that country when a hog is sick they wrap him up in a wet sheet or a sheep and give him a regular body pack. There are pictures I saw them at Graafenberg of hogs with moist bandages around them such as some of you wear every night and cattle were being treated with these moist bandages. It was a very common practice among the country people. They used the same methods for themselves. Their methods were very crude. One method of relieving sleeplessness was to wet the nightgown in water and then put it on and go to bed. It was found to be a very efficacious remedy but the water was used very extensively long before this time. John Wesley the founder of the Methodist Church was well acquainted with the use of water. He wrote a little book entitled, "Primitive Physic" and in this little work he recommends almost every one of the water cure measures we use here in this institution, at least representatives of all the various methods, the fomentations, the morning cold bath. I remember one of those prescriptions for a child that had the rickets. There isn't any better one except a proper diet. He said if the child has the rickets it should be dipped in the cold water in the morning immediately after awakening and should be new dipped every morning for a year. Then he said the

child would be found well. Now the cold morning bath is one of the finest things for a child that has rickets. There is no doubt about that. He recommended water drinking and a large number of other remedies you might imagine we devised ourselves. I have a book of his published more than 100 years ago. I think my book is the seventeenth edition of his work entitled, "Primitive Physic". Our reforms have come from the common people. We have come at last to recognize this thing that the body is the real curative agent, that the healing power is not in a bottle, that it is not in a pill or in a remedy or in a bath rub but it is in the patient himself. The healing power is within the patient which operates the cure and if a man is ever cured it is because he has got well in him. It is because he has *Vis medicatrix naturae* within his body that is capable of restoring him to health and if he has not got it he cannot get well. People say sometimes, "Why don't I get well faster" and I sometimes say, "You haven't *Vis medicatrix naturae* enough. You have spent your *Vis medicatrix naturae* in big dinners and suppers and in other ways so you haven't got it and you will have to go along slowly" and we have got to recognize that is the only way for a person to get well, is to adopt the method of the old prophet who said, "Cease to do evil and learn to do well." Change of habits is the most important thing a person who is chronically ill can possibly do because the man who is chronically ill is sick because he has cultivated ill health in the great majority of cases. Now acute sickness comes from the outside but chronic sickness is a home product. It is cultivated at the dinner table and the supper table. It is developed right in the home by unphysiologic habits. Now what we are seeking in this institution is to find the physiologic way, the biologic way and then walk in it. Sometime ago Professor Cattell the editor of the Popular Science Monthly, one of our leading scientific men, called here and we had dinner and he met me in the office immediately afterward and I thought he looked as though he was not very well satisfied with his dinner. At any rate he said, "Doctor Kellogg, I want you to tell me what your basis is. What is your basis?" "Why", I said, "What do you mean?" He said, "You don't have any meat here. You don't eat

meat. I see you had no meat of any kind on the bill of fare. I want to know why. What is the reason for this? " I said, "Our basis is physiology." " Physiology" he said. "Why do you exclude meat if physiology is your basis? Is not meat food?" "Yes", I said. "Meat is food for some animals but man and I personally and the rest of our folks here belong to the primates, to the great class of animals known as primates. Now you are a scientific man and you know that the primates are represented by man and the higher apes and I would like to know if you can mention to me any primate besides man that eats meat." Well he thought a little while. "Well, no. I don't know that I can", he said. "Well, do you know of any primate that ever lived or any primate represented in the fossil remains of the crust of the earth that ever ate meat that you know of?" "Well, I don't know that there is," he said. "Well, I am a primate and I don't see that I have any business to eat meat when no other primate ever ate meat. Meat is the diet of carnivorous animals like the lion, the cat and other animals that are adapted to a meat diet. I am a primate and my alimentary canal and my digestive apparatus are not adapted to a meat eating diet and I have no instinct to lead me in that direction." A young cat that has never seen a mouse when it sees it for the first time will lay hold of it and eat it but give a baby a mouse, for example, and see what it will do with it, especially a girl baby. See what will happen. Give any sort of animal to a man or woman that has never been taught to eat meat, that has never been inducted into the meat eating process by slow degrees and you will find there is no instinct leading to the catching of an animal and eating it. There is no natural instinct in the human body to slay and eat but it is perfectly natural to take an apple, a peach or plum or a cherry or any other kind of fruit and place it at once in the mouth and eat it.

It is perfectly natural for a baby to pick a cherry ~~if~~ of a tree if it is held up to the tree and is near enough to the cherry so it can. So we see there is no instinct in man to eat meat, it is unbiologic, unphysiologic and the whole purpose of this institution as I said, is to find the physiologic way of eating and of living in all particulars, then follow that. Now the principal work of this institution is to train people into correct habits so far as we know what they are. Now what is the advantage of training? I am going to illustrate that to you in a few moments by some pictures on the screen here, but first just a word about what is to be accomplished by training. You know when an architect builds a house he does not build that house so that it is just barely strong enough to hold together. That is the kind of houses they make sometime for exposition purposes, perhaps some houses like that at the exposition at Chicago I remember, and some of them fell down before the fair was over. These pasteboard houses are only for exposition purposes, but the house that is intended to be used ~~for~~ to last, has put into it a surplus of strength. There is a large margin of safety put into every beam, every pillar and every part of the house from rafter and every sleeper, every part of the house has put into it, a large margin of safety. Now that margin of safety is the thing that enables the house to last; that is what makes it possible for a house to indure. A pasteboard house looks just as well when it is first made as a house of oak or a house made in a substantial manner, but the house made of oak will last for centuries because it has a margin of safety which provides for the wakening influences of time. Now the human body is made on exactly the same plan. Take for instance, the lungs as an illustration. We have in the lungs a capacity of three hundred cubic inches. Now of this three hundred cubic inches, we use less than thirty in our ordinary breathing. We take in less than thirty cubic inches and breathe out less than thirty ~~xx~~ cubic inches when we empty our lungs. When we have taken an ordinary breath, if we take a very deep breath in addition expand our lungs as fully as we can, we can take in 100 cubic inches more and if we breathe out an ordinary breath, we can breathe out one hundred cubic inches

more and there is left in the lungs still after we breathe out all we can, 100 cubic inches more, so we have nearly 300 cubic inches of air space in the lungs of which we only use about thirty under ordinary circumstances, but we may increase the lung movement by special effort so that we can breathe out 130 cubic inches more than that, 230 cubic inches we can breathe out and in in cases of emergency. That is, we can breathe out and in seven or eight times as much air as we ordinarily do breathe. Now what is the reason for that? Because we sometimes need more air. Oxygen is the element of the air that furnishes power to the body, just as oxygen is the thing that makes the power in the furnace. Fuel would be of no use without oxygen to burn it, but the oxygen combined with the fuel releases the heat stored up in the fuel, the sunshine that has been crystalized there centuries ago perhaps in the case of coal and the heat then makes the steam in the boiler and that makes the pressure and the pressure of the steam runs the engine that turns the generator and makes the electrical current that comes shining out again here, giving us the sunshine that has shown upon the earth perhaps one hundred thousand ago or more. Now that ~~XXXXXXXXXXXX~~ same sort of alchemy is going on in the body. Food is fuel and oxygen burns the fuel and releases the energy which is in it. Every muscular contraction, every thought of the brain, every movement of the body, every contraction of the heart, every heart beat means ~~an~~^{the} expenditure of energy and the consumption of oxygen. Now when one is quiet, he needs but little oxygen and when we come to exercise, the ~~xxx~~ vessels of the muscles swell out and the muscles receives, when active, as much blood as when idle, sometimes as much blood and we have to take in six or seven times as much air in order to supply that working muscle, in order to keep the blood that is going through the muscle supplied with oxygen. We do not have to take in ten times as much air because when we are actively engaged in vigorous ~~XXXXXXXXXX~~^{effort}, the consumption of ~~XXXXXXXXXXXXXXXXXXXX~~^{oxygen is more complete}. The utilization is more perfect and consequently we are making better use of the air and do not have to take in so much in proportion, but the thing I want to impress upon your mind is this: large margin of safety in the lungs. Now a person who gives tuberculosis--I know a man in this city who had trouble with his lungs some

years ago and he lost one lung. This man came to this town thirty years ago to me to examine him and I found one lung completely gone, collapsed, not from consumption of the lung, but perhaps tuberculosis of the pleura. Perhaps he had pleurisy and had to have his chest tapped, and so he lost the use of one lung completely. That man is still an active business man in this city. He looks as well as he did thirty years ago and he has lived thirty years with one lung. Why? Because he had not yet used up his entire margin of safety. Now he cannot run. If he tries to run, he is out of breath before he has gone ten steps because that one lung is not capable of supplying the body with the oxygen necessary. He has lost half his margin of safety, so he is crippled. Now the same thing is true of the heart. The heart ordinarily beats at the rate of about once a second. This heart beat can be enormously increased. I remember a some time ago, a young woman came into my office and her heart was running away so fast, I could not count fast enough to count her heart beats, so the only way I could ascertain how fast her heart was going, was to get a large sheet of white paper and get out my pencil, then with my pencil with one finger upon her pulse and my pencil keeping time, I just made dots upon the paper with each heart beat you see, and I made dots for half a minute and counted up the beats, and found in half a minute, 150 beats. That meant three hundred heart beats a minute. That is five heart beats every second. You see that is going some as the boys say. The heart can contract five times a second and keep it up hour after hour, hour after hour. That was the most active heart, I think, I have ever encountered. Well I still had some doubt. I said, "This may be a sort of fluttering of the heart and not really beating." So I took a sphygmograph, an instrument which records the entire heart beat and I got the tracing. I ~~found~~ timed the strip of smoked paper that run through the instrument, and I got exactly the same results, 300 heart beats a minute, and somewhere I have the graphic record of those heart beats. Now that shows you what wonderful extra capacity the heart has. This is the margin of safety of the heart, so ~~xxxxxx~~ as to provide for an emergency, such as when you have to run to catch a train, or when we are otherwise compelled to ~~xxxx~~ ^{require} extra ~~xxxxxx~~ work of the heart

as in a fever and under some other circumstances. Now what I have said about the heart and the lungs is also true about other parts of the body, about the kidneys, for example. The kidneys are eliminating about three pints a day. I recall a case in which a man called ~~gaxx~~ here to see me about ~~hx~~ his son. He said he thought he might have some kidney trouble, and he would like me to investigate his case. "All right," I said, "bring a twenty-four hour specimen." A ~~dayxxxxxxx~~ couple of days later, I looked out of the window and I saw this gentleman coming along with a dray, saw him standing on the dray and a bushel basket there, and he pretty soon came into my office and the man assisting him, brought in a bushel basket full of two quart jars and there were fourteen quarts of this twenty-four specimen. The young man came to see me then and I had a talk with him, and I said you must drink a good deal of water. "Oh yes," he said, "I do. I take a pailful of ~~water~~ to bed with me every night and a tin dipper, and every little while I wake up and take a drink." And this boy, of course, had to drink even more water than his kidneys eliminated. Now I mention this so you will see what a tremendous margin of safety there is in the kidneys. So with the stomach. I saw an account of a ~~fight~~ sometime ago of a man who had eaten fourteen pounds of beefsteak at one meal. I believe one of the former mayors of New York ate eleven pounds of beefsteak at a contest at which men had their hands tied behind them and they had to go after the beefsteak in regular biologic fashion. Some of you perhaps have seen such contests or heard of them at any rate. That is the way they eat beefsteak; that is the proper way; that's the way the dog does it. Well the stomach was able to digest all this beefsteak. The capacity of the stomach for digesting is simply marvelous. It is ~~mlimited~~ not so much in the secretion of digestive ferments as in the capacity to handle, to contain and to handle the foods. An interesting experiment made sometime ago by a German professor shows this very well. He took a tube and passed the tube into the dog's stomach, then passed water through that dog's stomach until he had passed 2000 liters of water through this dog's stomach, 2000 liters, that is more than two thousand quarts for a liter is a little more than a quart; 2000 quarts over 500 gallon was passed through this dog's stomach.

Then he tested this water for the presence of pepsin by adding a little HCl to it, and tested its digestive power and found that dog in one continuous session had produced pepsin enough to digest a dog once and a half times its same size. That shows what a marvelous capacity the stomach has, what a great margin of safety. I am not going to say that this margin of safety is to provide for big dinners, because some of you may take lessons from that suggestion and feel that it is perfectly proper for you to make use of this margin of safety. I am sure there are very few people who have not ~~gana~~ already gone beyond their limit in that particular. The purpose of this margin of safety is not to enable one to consume great dinners. That is not the purpose of it. The purpose of this margin of safety and of the margin of safety of the heart, lungs, skin and all the other organs of the body, is to enable one to endure for a long time, the ravages of time, that is what it is for because as times go on, as we grow older, time is working our destruction just as time is wearing upon the hearth, upon everything that ~~is~~ exists upon the face of the earth, and is tearing it down, is destroying it and Old Father Time is right after every one of us and the margin of safety is to enable us to stand up against this destroying influence of time, and the larger our margin of safety, the longer we can stand this corroding influence of time. That is the reason why when we test an old person for example for his lung capacity, it is not equal to that of a young person. Here is a young man who has a lung capacity of 300 cubic inches, perhaps, a tremendous lung capacity, a much larger lung capacity than that has been shown by some. Now when that young man gets to be 75 years old, his lung capacity will be somewhere about 180 ~~ax~~ perhaps, not 300. Why? Because the muscles have shriveled and shrunken, the elastic cartilages which must bend when the lungs have expanded have become ossified. You cannot imagine how much surprised I was when I had an X-ray examination sometime ago and found my cartilages were not ossified yet, so I concluded I was still young, so there is still hope for me to expand my lungs, to increase my lung capacity a little. Ossification generally begins along about 40 or 45. In some persons even earlier than that. I was examined the same day with a young man who considers himself a healthy man--a young man not quite forty, I think thirty years

and ~~xxxxxx~~ his cartilages were ossified very much more than mine, So as I said, I felt quite proud of that fact and it cheered me up considerably because I was brought up to believe that I would not live till I was twenty. It was said that certainly I could not live till I was thirty. So When I found myself still with some evidence of use at 63, I am hoping that I can live on for a little while longer.

Now this margin of safety is the thing that keeps us alive. I remember very well sometime ago, a man came here and I found he had a tumor of the kidney. He was a circuit judge from Ohio and a man of considerable prominence and a very able man and a most excellent man, one of the most charming men I ever met in my life and I was very sorry to find he had this terrible tumor that was giving him terrible pain. He was suffering all the while. It was shortening his life, in fact, and it was necessary to remove the whole kidney. After the kidney was removed and he recovered from the operation, he came to my office and he said, "Now Doctor, I belong to the 'one kidney' club. There are five of us" and he mentioned four friends of his who had had the same operation, and he said, "Now I want you to tell me just what how to live because I know I have got just one kidney and I cannot have this operation repeated and I have got to take awfully good care of it." So I marked out a course for him to live and he followed it up to the letter. This operation was performed some twenty odd years ago, and five or six years ago, the judge came back to see us. He had enjoyed good health; he was a man over fifty at that time and he had been enjoying good health for more than fifteen years and he came back here and I couldn't do anything more for him this time, because arteriosclerosis had begun and that kidney had become worn out with the extra work it had to do, and his renal efficiency was away, away down and all we could do was to make him comfortable. I could not say very many cheerful things to him ~~as~~. He improved a little while he was here, then he went home and I knew he had but a very, very short time ~~as~~ left, but if he had had now the other kidney, you see he would not have been reduced to that extremity. We have three times as much kidney capacity as we absolutely need. That is, a man can live with two-thirds of one kidney. He can lose one kidney and lose one-third of the other

kidney and still live. There is a limit, however, to the kidney capacity and after the whole margin is used up, then he must die. Now what has this to do with Sanitarium treatment? The thing I want to impress upon your minds here, is that our whole business here in this institution is to increase the margin of safety so as to increase the life expectancy, so if possible to lengthen out one's days by economizing his safety margin.

Here is a man using tobacco ~~and~~ for instance--I have often met such men and labored with them. I was exorting a man a few minutes ago, just before I came in here. "Doctor," he said, "I know you would get after me. I just told a friend of mine as soon as I met you, that you would just go for me about my tobacco." I said to him, "A man who is in public life, I think he ought to set a good example to other folks, especially when he knows better." Well a man, who uses tobacco as this man has, sometimes said to me, "Well it doesn't hurt me any. If tobacco ^{would} hurt me., I would stop its use at once. Of course, I am not such a fool as to do a thing that would hurt me, but it doesn't hurt me at all. I have got used to it so it doesn't do me any harm." But there is where men are deceived. A man does not know that tobacco is harming him until after his margin of safety is consumed, you see. It is only after his margin of safety is all gone that he begins to appreciate that it has been doing him harm. The same thing is true of alcohol. People say, "Oh it doesn't do me any harm. Why if cocktails hurt me, I wouldn't take them, but I really feel good after them. They seem to do me good, so I am going to keep on till I find it is hurting me and then you may just believe, I will stop right off." But when a man gets to the ~~time~~ point where he discovers that he is being damaged, that the margin of safety is gone ~~and~~ ^{an} irreparable ~~damage~~ injury has been done and he says then, "What the use of trying to do anything." You see, the prospect must be pretty bad for a man who has reduced his margin, ^{but} ~~the~~ margin of safety can actually be increased. ^{I know it,} ~~xxxxxxx~~ I have seen it done. I might tell you another little circumstance, an experiment done in Germany sometime ago which was very interesting to me as it showed the recuperative power of the body. A physiologist did a very cruel experiment upon a rabbit. He opened the rabbit's body and ^{he} cut ~~and~~ off half its

liver. Three months later he re-opened the abdomen of that rabbit and found the rabbit had a liver just as big as it was before. The rabbit had reproduced the half of the liver that had been removed. Then he said, "Let us see now what will happen if I remove the other half." So he removed the other half of that rabbit's liver and at the end of three months, opened the abdomen and the other half had been reproduced. So you see that rabbit had a brand new liver. It had actually been reproduced. It is marvelous what vitality these internal organs have, what wonderful things they will do. We sometimes have occasion to do operations upon the stomach, and Prof. Cooper (?) who has made special study of this subject tells us that when the stomach has been operated on and portion of the stomach wall, the mucous membrane containing the glands that make the pepsin and the acid have been removed, the stomach actually goes to work and reproduces those glands. The skin cannot reproduce glands in that way, but the stomach can. These internal organs--quite a number of organs in the body have this recuperative power.

A missionary down in the Sandwich Islands some years ago, told of an interesting observation he made. They had down there a curious kind of land crab that is very particular in its habits. It lives upon the shore in little crevices in the rock and it goes down to the seashore every morning to get breakfast. The land crab, as I said, is very particular about its habits. If it gets a leg dirty, it does not wash the leg,--it does not understand about the use of water for such purposes, but it deliberately nips it leg off. It is not worried because it knows that in six weeks it will and then it will have another nice new leg as good as the other one was, because the crab carries around a series of leg buds under its shell. The same thing is true of lobsters. They get to fighting and tear off one another's legs in the most reckless manner, and in a few weeks the legs are reproduced again just as good as ever. Well a missionary saw this land crab run down to the shore one morning and watched him. He fell off the edge of the rock and fell into a mud puddle and he crept out upon the dry ground and surveyed himself for a moment. He saw that every leg he had was soiled. He proceeded immediately to nip off every one of his legs and slowly

dragged himself home into the rock by his nippers and in six weeks he came out with a brand new set of legs. And now you can take an earth worm and cut it in two in the middle and one half of that worm will grow on a head and the other half a tail, so you have two worms instead of one. Now if you take one of these curious little pollets?~~af~~ out of the sea and chop it into mincemeat and sow it broadcast into the water, every single one of those little bits will attach itself to a rock and become a full sized Pollet(?)so you see there is a marvelous recuperative power in nature and we have some of it in ourselves. We cannot ~~kixx~~ lose arms and legs as the lobster and crab can, but we can actually improve our livers, stomach and other internal organs which has to do withour animal life which are of the greatest vital importance to us. Now you want some further proof of that applied to the body itself. I will tell you a case:

v-p

We had sometime ago an elderly man who came here who had serious bladder trouble. He had stones in the bladder that had to be removed. When he came to take the renal efficiency we found it to be only 35% of what it ought to be, only 35%. Instead of being 100 % it was only 35, only about one-third of what it ought to be. I said, "Your case is too serious for operation. You have not nearly margin of safety left in your kidneys to carry you through the operation. The anaesthetic will kill you. I would not dare give it to you so we treated him carefully and patiently and waited for three months. At the end of that three months his renal efficiency was increased to 65% instead of 35 and we did the operation for him and he went sailing through it beautifully and today he is enjoying splendid health. I have seen this many a time. Whenever we are preparing a patient for an operation we always take the renal efficiency test because the anaesthetic is probably the worst part of the operation. An eminent eastern surgeon made the remark sometime ago that surgeons never killed patients. ^{is} It ~~was~~ always the anaesthetic that does it. It is certainly very rare that the operation itself is responsible for death now days. It is the anaesthetic. That is the dangerous part of the operation so before we give an anaesthetic we always know the renal efficiency and with great care we find it is possible to build people up, to increase their renal efficiency untill they are able to bear the operation and that we are constantly doing here. If a patient's renal efficiency is low, we refuse to do the operation untill it is high enough so it is safe to have the operation done. Now don't you see that this increased renal efficiency is just as useful for a man as a means of extending his life as it is of a means of carrying him through an operation because old father time is operating on us all the time. The inroads of time are being made upon us continually and the time will sometime certainly come when the margin of safety of some vital organ will be consumed and then it will be impossible for us to live longer. The vital chain will be broken. Now you know the strength of this chain is only

the strength of the weakest link. The weakest link determines the strength of the whole chain because when one link breaks the whole chain is broken and if one link only has half the strength of the other links when that link breaks the whole chain is broken and is useless, so it is with the body whether it is the heart link, the lung link or the brain link, the stomach link, the kidney link, or any other vital link in the chain of important vital organs in the body, whatever one it is, when that link breaks the golden cord is broken. Well, now let us have a few pictures. Death comes as the result of a complete breakdown of the forces of the body. Just a few pictures to show you how to cultivate an increased margin of safety. See these children at play. Those children are building up their margin of safety. If one of those boys was put into a cage and kept there he would have a very small lung capacity. When he was twenty he would not have more than half of the lung capacity he is going to have if he engages in active, vigorous outdoor sports. It is noted in Colorado that when the horses come from the east and get into those mountains they are short of breath and not worth very much for some time. They have to be there about six months before their chests ^{expand} ~~xxxxxxx~~ and their lungs have become sufficiently large so as to enable them to breathe and work in that region. Now these boys are building up their margin of safety and accumulating this capital of health that will carry them through the hardships of life. Here are a lot of girls learning to swim. We have classes for the children of the town in some of our swimming pools during the summer. I have a little playground at my house to set a good example for the town in getting them interested to do something for the children and after some years of effort in getting the thing done, I arranged a playground in my own back yard and you see a couple of hundred children there every day in the afternoon in the summer time. I open my playgrounds when the schools close in the spring and close them again as soon as school is opened in the fall so we keep the boys and girls off the streets and give them an opportunity to cultivate good health and vigorous bodies and a large margin of safety. Grown people can improve with exercise. I have been telling you how the lung capacity can be

increased. These air cells expand. The chest capacity increases. I remember some years ago a society girl came here with almost no lung capacity at all, only about three inches and six months later she came into my office and was very proud because she could expand--there was one good reason why she could not expand in the first place. When she came in here she could not expand her waist one-eighth of an inch because of her dress. She ~~told~~^{showed} me that she was so thoroughly reformed in body and in dress, also after wearing her usual dress she was able to expand her lungs so as to increase her waist measurement seven inches. Now that is worth while. She increased her lung capacity you see and her margin of safety so with the heart. The heart does an enormous amount of work. 124 tons it lifts every day. The heart beats in an ordinary life time not less than a billion and a half times, once a second. Figure it up and you will see that it is not less than a billion and a half. If one lives to 67 or 70 years of age the heart will beat two billion times and every time it makes a lift. If the heart is weak its lifting power will be consumed, will be used up long before perhaps any of the rest of the body is ready to go to pieces, the heart will go to pieces. We have with us constantly here persons whose hearts have collapsed long before they ought to. This weakness or collapse of the heart very clearly shows itself in the swelling of the ankles perhaps or in shortness of breath. Such a person cannot walk up stairs, cannot hurry without developing this weakness of the heart. I remember an experience I had a good many years ago. I had been living a very sedentary life, had been so busy about my studies and work in my profession that I had utterly neglected to exercise. In fact, I had never had any chance for exercise, never played any games in my boyhood. I began to take up a man's duties when I was ten years old and worked regularly ten hours a day and earned my two dollars when I was ten years and six months old working in a shop. I had to work my own way through the world and through my education so I have been very closely confined. Unfortunately I went into a printing office and learned the printers' trade when I was a very small boy. I grew up indoors, never had any outdoor life

at all and about thirty years ago I found myself with such a weak heart that when I walked downtown I had to get a cab to bring me home. I remember one time I got downtown and I could not possibly walk up that little hill for I was completely out of breath and I could not find a cab so I had to hire a dray to bring me home and I felt so humiliated at having to be brought home on a dray that I said, "I am going to cure this thing." So I began regular systematic exercise. I had been prescribing exercise for other people but did not take it myself; I made up my mind that it was time for me to begin to take my own medicine so I assigned myself the duty of leading the exercises in the gymnasium myself and for three years I led the gymnasium exercises morning and evening and I got me a bicycle and I believe I brought into Battle Creek the first bicycle that ^{was} ever seen here and I rode the bicycle. I used to go out, first I could ride a little distance. I remember my first trip after I learned to ride the bicycle. I had learned sometime before but I had not been riding at all. I rode just around the drive a couple of times. I was so out of breath and my heart was so fluttering about nine o'clock or ten o'clock in the evening that it was three o'clock in the morning before my heart was quiet enough so I could go to sleep. It was running away at the rate of nearly 200 a minute. I mention this so you can see I was really in a somewhat serious condition. I said, "I have got to keep at this thing until I build up my heart for I have no capacity" so I kept at it until I was able to drive my bicycle ten miles through these sandy country roads and keep up with a smart horse. Then I began to feel a little better about it. I kept up my exercise several years until finally I was able to lift up 750 pounds of dead weight and could take a 200 pound man off the floor, put him on my shoulder and carry him off. I worked at it persistently every day for I believed that was the only way I could hope to save my life. While I have not had an opportunity to keep up systematic exercise, especially for a number of years, still I had an interesting experience last winter that made me thankful that I had done something in that line. I was in swimming at a place where they told me there was no undertow but a storm came in and there suddenly came a big tidal wave into shore

that picked me up and carried me off to sea and I found myself way out where the water was fifteen or twenty feet deep and such great big rollers coming in eight or ten feet high that there was no possibility of getting back and I saw at once that it was simply a question of endurance. I could keep myself floating but could not possibly get in shore for the back rush was so strong that it kept carrying me further out all the time so I gave my attention simply to keeping up. I knew it was a matter of endurance. I kept my eye on the big rollers and when they came near me I made a plunge for the top and I was able to keep myself afloat until they were able to get out from shore and bring me in. I have thought of it a thousand times.

v-m

I had all I wanted to do I can assure you, for when I got in I don't think that I could have endured the situation more than one or two minutes longer, but I had just enough strength to bring me in. Now I am telling you this story so you will see the margin of safety is the thing that saves one's life. If I had not taken the bicycle exercise thirty years ago, and if I had not kept up a certain amount of exercise since, I certainly would have gone to the bottom and I would not be here now. Now it is the margin of safety that carries us through emergencies, not always that kind of emergency. It may be a fever; it may be a hard cold; it may be an attack of influenza; it may be unexpected exposure of some sort, some hardship or some extra strain upon us. It is this margin of safety that saves us, so it is of the highest importance to every one of us to have just as strong hearts as we can get. How are you going to get the heart strong? By exercise. The heart is a muscle and the only way to get a strong heart is by exercising the muscles of the body in general for the heart works when the rest of the muscles work. When a muscle is at work hard, it requires ten times as much blood as when it is idle so the heart must do that amount of extra work to keep the muscles supplied. That is the reason why exercise is so large a part of the work here in the institution, exercise after break-

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fast and after breakfast, between meals, after dinner and after supper. I expect some of you think we overdo it. I am sorry everytime I look into the gymnasium that I do not see more people there. There are a great number of people here missing one of the best things we have here. We have recently, by the way, introduced another kind of exercise and that is weaving. Some of our people say, "I don't like to caper around in the gymnasium, I want to do something useful." We have just started a new department of manual labor for people who want to do something useful. We have got two or three rooms down here in which you can weave a net. If some of you gentlemen should take a notion to weave a net and take it home to your wife as a surprise, it would be an evidence that you could make yourself useful in the family. The young lady who has charge of this work is very skilled. She is in our normal school and is giving instruction in net weaving and basket making in order to pay her expenses through our normal school. She is a very excellent young woman and I am glad to recommend her highly as a teacher and as a young woman. She has been engaged in this work before in another institution and is very capable. The charge is very small, only fifty cents a lesson. A lesson may last an hour or two as you may have opportunity and you have the use of a room, and the lady was showing me tonight, a very beautiful net she had woven. It only takes a little while to weave a net that sells readily at the stores for four or five dollars and at the same time you have excellent work. Special pains is taken to make the work effective as a means of exercise by keeping the chest high, then in using the arms, the lungs are made to work and when the lungs are made to work, the heart is made to work so the heart is steadily strengthened. Now many people cannot exercise as freely as they would like, especially people who come to the institution here, they have not the power to take as much exercise as the body really requires, so we have the Mechanical Swedish movements and it seems invaluable. The shaking and vibration and all the various movements, ~~each~~ each one has a special value. Here you see some of the other movements. Here is a movement which is really a very useful thing. It helps to drain the blood out of the abdomen where it has been stagnating and kneading machines and the friction machines are also useful. Here is the manual training and the slloyd work. Some years ago we had this department in which we give special attention to woodworking. This was

very fashionable in Sweden and particularly in Denmark, and we imported the superintendent of this kind of work for the schools of Denmark, a man who had ~~given~~ attention to this work all his life, what is known as sloyd and I found it really very helpful. I remember one lady I met in Nashville, found her ill in bed with heart trouble. She was so feeble she was given up as a hopeless case. The doctors said she could not live very long. I looked the case over, thought there was a chance to help her perhaps, and brought her home with me at her request. It was a very delightful thing to me ~~which~~^{six} weeks later to find this woman standing at one of those benches making some dainty little wood models and at the end of three or four months she went back home. Her heart was not well, of course, she still had the same organic trouble there, but her margin of safety had been ~~k~~ enlarged so that she was ~~xxxx~~ able to live ten or twelve years longer. It was only recently that she died and she had ten or twelve years of the most useful life, not only for herself but for the community. I am sure the sloyd had a great deal to do with it. It was very good for that woman to have something to divert her mind as a healthy attitude of mind has so much to do with recovery.

Now this band ~~xxxx~~ you see here connected with this machine goes around the trunk, over the liver, stomach, colon and the shaking movement stimulates the activity of these organs and the circulation of the blood through the organs and it very often relieves^a miserable heavy distressed feeling in that region of the body as nothing else will do.

Here are the vibrating bars. This is wonderfully effective in relieving neurasthenic sensations, nonsensations and chilly and creeping sensations. These are all wonderfully relieved by these vibratory movements. The vibrating chair especially is wonderfully resting also. The languor and the depression that neurasthenics often feel are frequently relieved entirely by spending a few minutes in the vibrating chair. Here we have the manual Swedish movements in which movements are administ~~xxxx~~ered by an operator. These are especially useful for persons who have acquired special weaknesses as weak abdominal muscles, who have weak ~~xxxxxx~~ hearts so that they are not able to take a large amount of ~~xxxx~~ exercise. Here are other of these movements, showing the various movements. People who cannot take exercise enough in a voluntary way, need these exercises

to train them up to more vigorous exercises. Here is a manual movement which is very valuable, indeed. In this movement, the patient holds his leg rigid and the operator raises it. In this way, the muscles of the leg and of the back, in fact, of the entire trunk are exercised. Their abdominal muscles particularly are brought into place. The weak condition of the abdominal muscles is one of the conditions which is most commonly present in patients who have led sedentary lives and is one of the most damaging of the acquired weaknesses of the body. Here are some more of these manual movements. These are active passive movements. We have the strength testing machine. If any of you have not had your strength tested and your chart made, you certainly ought to have it done so you may know how much you have improved while you are here. This is testing the strength of the thigh extensor muscles. ~~R~~^A band is put around here you see, the *lower end* of the limb here as near the end of the bone as possible; then the leg is forced back, the extension muscles of the leg are in that way tested. Here is a test of the flexor muscles of the forearm being taken. One of the most important kinds of training is the training of the body to correct posture. This is the correct posture for sitting in an ordinary chair, but the back is not supported. This space should be filled in so the back will be supported. This can be arranged by putting a cushion in the chair but it is better that the chair itself should be made with a forward curve of the back and the back should be inclined forward so that the body can rest against the back. A correct position in standing can be acquired by a very simple manouver. Simply stand with the head, shoulders, hips and heels against the wall. Also the hands against the wall; then the head is bent backward sufficiently to raise the chest from the wall; then the person steps out from the wall and the body is in exactly the correct position, so a person can get a correct standing posture without any training.

Here is a folding exercise table which we find very useful. It is here ~~in~~ the horizontal position and various exercises can be taken in this way. Here is the table in its inclined position. The head is down. By this exercise, one leg is raised and the head is raised. This brings the abdominal muscles into very very strong action. Here is the horizontal table with the patient using the muscles of the back in vigorous fashion. Here with the head lowered and the hands resting upon the bars for support,

the legs are thrown upward, then separated and closed. In the position the abdominal muscles are exercised, also the muscles of the trunk. Here is a splendid exercise for curvature of the spine. By putting the body into this position, the muscles of this side are made to contract, so as to correct the curvature. Here is another exercise which strengthens the muscles of the back which are very strongly used. Here is an exercise for the leg. The leg is drawn up, then forced back and forced out. In this way, very strong action of the abdominal muscles is accomplished. Here are some breathing exercises with the body in an inclined position to allow the blood to run down out of the liver and stomach and other internal viscera. Here is another breathing exercise with the hands placed under the head. This is a strong exercise for the muscles of the trunk. The feet are supported by this strap and the body is extended beyond the end of the table and you see it is a very vigorous exercise suitable only for strong persons. This is a very important exercise, lying in the reclined position, the hands placed at the lower part of the abdomen, and in connection with breathing, the hands are drawn upward and the viscera are lifted up into normal position. This little handle and cord are for the purpose of lifting the body up at first. After a while the muscles become strong enough so the body can be raised to this position without the aid of the cord. Here is an exercise for persons who are not strong enough to take exercise with the head down. Here is the same thing with the body raised. The body can be more easily raised ~~xxxx~~ in this position than with the head down. Here is a very vigorous exercise for bringing all the muscles of the trunk into play. This shows the different positions in describing the ^{full} circle. It is really a very vigorous exercise, indeed. I do not know of any one exercise which is more effective in correcting weaknesses of the trunk and abdominal viscera than these exercises by the table. I am going to tell you something more about training sometime, ~~xxx~~ but will let you go now as it is bedtime. I thank you for your attention.

End.

Commencement Exercises of the Normal School of Physical Education
at the Sanitarium Chapel,
Battle Creek, Michigan,
Wednesday, August 19, 1914 at 8:00 P. M.

Dr. J. H. Kellogg:

We are fortunate in having with us tonight to give the principal address on this occasion one of the leading educators of the United States, a man whose work in special lines of educational research has made his name familiar not only in this country but in foreign lands. I take special pleasure in introducing to you tonight Prof. J. H. Keith, the President of the Oshkosh Normal School of Wisconsin who will speak to us on the subject, "Social Demands on Physical Education." (Applause)

Professor J. H. Keith:

It is always a pleasure to be with young people who are graduating. They are filled with a consciousness of power which is new to them and this sense of power comes from the fact that they have measured up to standards which others have set for them. It is a peculiar pleasure to me to be here tonight with these young people who are finishing their work because I feel that they are going to be the means of bringing to the boys and girls of this next generation a great many things which I did not get and which I have regretted all because I was born too soon in the history of the world and so I thought I would speak to these young people tonight on "Social Demands on Physical Education" speaking of the lay an not as an expert in that field at all and speaking possibly on behalf of the tax payer upon whom the great burden of expense will ultimately fall if we make of physical education what most of us would like to make of it in public education in this country.

Private philanthropy may be, to be sure, provided here and there a gymnasium and equipment but it will be scarcely as a drop in the bucket until facilities for physical education become an integral and/required part of the work of our great public school system. I feel justified in speaking tonight on "Social Demands on Physical Education" because these young people ought at this time to look upon their work in its widest possible relation. The thing is through its relation. Physical education is not a thing by itself. It is not as the name seems to imply, a kind of education that can go on or that ought to go on apart from other kinds of education but it does mean that we are to give a different sort of emphasis to a certain element of education, an element that has always been present whether the school room and the teacher provided for it or not and to take this very vital thing and make of it a subject, a study, a school exercise, call it what you will of value equal to anything that the curriculum of the school has ever maintained. I shall endeavor to be brief in what I have to say because I know that you feel that the weather conditions are not the most favorable for any extended discourse and yet I want to make certain definite points which these young people can carry with them and which to my way of thinking stand for the most important of the social demands on physical education. Now first this physical education if it is going to make meet the expectation of we tax payers has to be a constructive thing. It cannot be merely an imitative thing. It cannot be merely a something which is copied from here and there and elsewhere and put together in a sort of jumble. It has to be a constructive thing from the first. It must have a plan in it. It must have a system in it. It must have a beginning in it. It must have a movement and it must progress toward an end. I can remember a span of twenty-five years ago when I entered a normal school and quite to my surprise I found that every little while the class exercise would be broken into, we would all be required to stand and go through certain gymnastic exercises. This very important and influential normal school in the middle west was trying to do something along this line but it failed and in that very school within a few years that dropped out.

Why? Why? Because the little gymnastic exercises that we thought were invented prematurely to overcome the lack of ventilation in the school building itself were not sufficient to justify their continuance. I have seen many and so have you of the Turner Halls or Turnverhs in this country flourish for a while and then die out. Why? Because there were not enough. They did not have the system, the unity, the plan to make them really constructive things. Each of these took a little bit of a section or segment of physical education and treated as if it were the whole round of it only to find that it was inadequate and therefore a failure. Physical education must be a constructive thing because what we have to face more definitely now than ever before in this country of ours is the production through education of efficient individuals. Now there is nothing that men do or that man has done in any field of human endeavor or achievement that does not rest back upon the body as a basis and consequently we must make this body as nearly perfect as it may be. in order that we may have the highest degree of efficiency in other things and this efficiency after all is not so difficult to understand. It seems to me that when we use that term, "efficiency" we mean the highest possible success in doing anything, the minimum of effort lost notion, the minimum of waste so physical education has as one of its major problems the formation of a constructive plan or system by which the very highest degree of successful doing may be possible by the body. Now physical education is not vocational education nor is it to be confused with it but it lies at the basis or rather it underlies all vocational education. There could be no vocational education without a certain degree of motor skill. It is the business and province of every aspect or section of vocational education but it should be a certain specific set of skills to the highest point of efficiency but now back of that must be the general motor development on which as a basis a vocational education can be built.

And one no sooner starts on his than he is confronted with difficulties. I am speaking now of two boys who happened to live on the other side of the street, one a boy of 13, short, compact, well built, highly skillful in all sorts of motor accomplishments, active, always doing something. He brought over to me the other evening and showed me a hunting bag he had made in which to carry works for my inspection. He had run this up on the sewing machine, fixed it up as best he could. Now there is a boy that will ^{take} a certain kind of treatment in physical education and profit by it and he can do all sorts of things in a gymnasium with profit and advantage to himself. Down the street about a block ^{of} is another boy the same age. He is within one half inch as tall as I am, a gangling, spindling shank fellow with a hollow chest, grown so rapidly within the past year or fifteen months that he doesn't even recognize himself when he looks in the mirror. Now there are two boys of the same age in the same class in school yet demanding radically different sort of treatment in physical education, in geography, in history, in arithmetic and practically everything else so the problem is not as simple as it would seem at first and I think the only way out is for us to get certain types or classes of individuals pretty thoroughly fixed in mind and arrange the work that we are planning for those different types of individuals in accordance with their needs and not give to all the same thing and that you see at once makes our problem difficult. This idea that mass instruction is so ingrained into our American way of thinking that we overlook or tend to overlook constantly the individual and yet we cannot have all individual instruction. It would be too expensive, I believe, for the people of this country wealthy and prosperous as we are to undertake and so it seems to me that the only refuge for us is in finding certain types or classes of individuals within groups that can profit by different sets of exercises.

Now I showed as my first point that this physical education must be constructive. It must have a plan, a system. We cannot take the Greek ideal because of our civilization is essentially different from the civilization of the Greeks and

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their ideal of physical education while it is in many things of suggestive value for us cannot be taken as an ideal nor as a pattern nor can we take the German type which has developed in reference to the national needs and national ideals and all look toward the formation of individuals who on the physical side will make wonderful soldiers, the German type having in it many elements of value cannot become the American ideal nor do I think that the world has yet produced through any country or people a system of physical education which we can take as our ideal. The American ideal of physical education, I believe, is yet to be worked out. The public is ready but the idea is still to be worked out. That leads me to my second point which is that this work in physical education must be concrete and real and as vital if it is going to take hold of boys and girls. It was Herbert and his disciples who taught ~~us~~ their school masters that there was something to be attained through instruction other than knowledge. This thing Herbert called ^{it many sided} interests ~~but~~. He went even farther than that and he said that the aim of instruction is to develop many sided permanent interests. The Herbertian would say it is not how much history this boy knows or this girl knows on finishing the eighth grade. The really important question is whether or not this boy or girl wants to know more history, whether through ^{you} what we have taught you have developed that desire to know that permanent abiding interest there which will make the child his own teacher. Now there is something in that idea for physical education. It must be vital. It must touch life, the life of the boys and the girls. It must be related to their way of looking at the world. It must be related to the things which they are interested in doing, in achieving. You all know that these running games appeal to children at a certain age and at a little bit later the running game has lost its charm in large measure and another type of game has taken its place but still even though we change the type of material it seems to me that the public has a right to demand that this work in physical education shall not stop with the school itself but shall have such a close and vital connection with the lives of these boys and girls that it will persist and therefore that it will lead

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them when they have left the school room, when they have gone into their routine occupation in life, lead them still to constantly recreate themselves for the work by building up and keeping to its highest efficiency the body and through these exercises and through these games it can be done. I have some friends who look with a good deal of disdain and disgust and certain business men of our acquaintance who go away to the ball games in the afternoon, who will hurry through their work on the day to get their desks cleared up and closed by three in the afternoon and then jump in^{to} their motor car and go out to the ball game. Follow those people to the ball game and see what they are doing. They are not merely onlookers. They are not merely rooters. They are really playing that game. If you can just watch one of them and see how he gets into all these plays. Why that is the next best thing to playing base ball is being in this country on the sidelines and getting into every play. That is a matter of recreation. A man forgets his business. It would be better if he did something else to be sure but that certainly has its value. If now through physical education these business men could be so trained as boys that when they get through their days work they would go out and play base ball with their own children, with the children of the neighborhood instead of seeing base ball games. How much better that would be in its influence on the boys and girls of that community and how much better for the men themselves. It is a strange thing how we grownups with our interests get out of touch with the interests of boys and girls and I believe that it is only as we become children again that we are really having recreation or re-creation because that is the way we ought to pronounce that most excellent word. The gymnasium is not enough. The apparatus is not enough. You must get closer to the boys and girls than that. The physical education must get down into the disposition of the individual, must get down into his muscles as a matter of habit or rather as a matter of mental attitude. My third point is that physical education must constantly make for democracy. Trade made the city and the dollars keeps it. The dollars perpetuate it and when men build cities they

build them on the basis of the economic idea and another idea of rearing children. Consequently, whenever you find people gathered together in cities you find conditions that do not make for democracy. Even industry has lost its educative value under the sway of the economic ideal. With the absence of power machinery the apprentice system broke down utterly, irrevocably and nothing has come to take its place. Now our feeling of kinship is based upon the fact of common experiences. I believe that physical education has in this a great opportunity, that is, it can possibly become the social cement for democracy in the future by providing that community of common experiences on the basis of which common mindedness rests. All of our coming together is based upon common mindedness. We agree which means that we think alike, not that we should always think alike because there is a value in different ways of thinking. There is an element of stimulus but we must have a common ground on which we meet. With the breaking down of the play traditions in this country one of the strongest ^{bonds} ~~points~~ of people disappears and I believe that it is a part of the work of physical education to re-establish people, tradition, and to form a body of common experiences which will tend to weld all people into a homogeneous mass and thus make for democracy rather than for suicide which is a thing ^{that} ~~which~~ successful business seems always to work towards. Then physical education must be ethical. You say I have already implied that we are going to get beyond the gymnasium and beyond the apparatus, that we are going to get close to the lives of these boys and girls. You can do that only through play and through games. Now these plays and games are essentially a matter of relationship of one to another. They have certain principles of fairness, of equity, of justice, of right, of the square deal bound right up inseparably with them. Now physical education therefore must be ethical. It must train the consciousness of these young children into a higher sort of thing. It must train this desire for success for our side into a subjection to a desire to have the best man or the best team win. It must train this desire to have success for our institution into subjection to a desire to have the square deal in every play, the honest, honorable thing. Now I have been interested in athletics for a good many

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years and the thing that has wrecked athletics more times than any other thing that I have known of is these very natural desires for success that were in- subordinated to the higher ethical ideal. I would never give a snap of my finger for a boy or a young man on a foot ball team who did not with all his being want his team to win and naturally I would not give anything for him as a man if he could not subject that desire to win to a higher ethical ideal and the pressure is so constant and insistent where ever competitive sports obtain. the motive for shading the thing just the least little bit or turning it this way or that way or the other way, of edging it just the least bit and the moment you begin to edge it the least bit these boys and girls know that you are dishonest and you become thereafter a teacher of dishonesty, skillful, crafty, perchance but nevertheless a teacher of dishonesty. Now physical education from this point of view may be one of the best things that can come into the lives of boys and girls or it may be one of the worst things. I have known mothers who have come to me with questions about their children, both boys and girls, ethical questions arising out of their games and plays. We had a volley ball contest with all the grammar schools of our city. We have had it for two or three years and we have to watch it all the while to see that something is not done through this desire to win that would spoil the whole thing. I believe that rivalry and competition have their place. I think there is a stage in the lives of children when individual rivalry and competition is a legitimate stimulus. When these boys who live on the next block about the age of ten or eleven wanted to race bicycles around the block against time it seems to me that is a perfectly legitimate thing but certainly that ought to become group competition and two years later when you take these boys with their bicycles and suggest relays, one riding around to that corner stopping his bicycle and another ^{getting} going on that same bicycle and going around and thus working in teams of three and four, they find just as much fun in it and the competition has become a group competition. Now the reason for making the transition to group competition just as soon as you can is the fact that group competition

seems to me to have a higher ethical value than individual competition because it has is a more social thing and so just as largely as possible we should like to have the competitive side of physical education to be between groups because it will develop, in my judgment at least, a higher ethical attitude. Now another thing. We who pay the taxes, we who are the fond mothers and fathers of these boys and girls that are growing up to take our places have to face with great chagrin but with truthfulness that this modern life of ours that we ourselves live day by day has in it many vices, many excesses, many deceptions to which we do not wish to subject our children but which we are in a measure powerless to keep from them unless they can get some other ideals than those which come from their homes and from the social groups connected with their homes. Now I am speaking honestly and frankly about this. Now what we would like to have physical education do is to inoculate these children of ours with certain ideals of physical education so that they would not become a prey to these vices and become a prey to these excesses of our modern life. I feel that can be done. It is the simple law of substitution in psychology and I have seen it done over and over again. I have seen a boy come up to college and get the first real contact with the world he ever knew in his life through playing foot ball and if my boy comes up to college as weak and flabby as some of the boys that I have seen when he found the chance to play foot ball, if he breaks both arms and both legs in the game I should rather have him with both arms and both legs broken and having had some real contact with the world than to have him with both arms and both legs full and a snob. For many boys the first real opportunity they have to subject their own desires to the welfare of a team comes through that thing. For many boys the first opportunity they have had in their lives to work for the glory and credit of an institution lies in that so in order to keep their place on the team, in order to win glory for the institution, led clean, wholesome lives. Now what we should like is to have these teachers of physical education inoculate our children so that our excesses and our vices and our dissipation will not

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destroy them and weaken them. I have tried to say these things rather plainly and yet as directly as possible and may I summarize what I have been saying. Physical education must be first a constructive system, a plan, not a hodgepodge in this, that and the other copied from here, there and elsewhere and thrown together simply because it happens to be the best we have and interesting more or less to us and we trust it will be interesting to the children. Secondly, this physical education must be concrete and real and touch the vital life interests of boys and girls. Third, we must constantly aim for democracy by building up play traditions, game traditions and laying a basis in community of experience for subsequent ethical action and democratic principles and four, it must form these life long dispositions in children so that they will constantly seek to recreate themselves and thus keep bodily vigor at a maximum and five, it must be ethical and six, it must, if possible inculcate our boys and girls against the vices of this world and if physical education can do these things and measure up to these five things that I have tried to set forth to you, the tax payers of this country will gladly pay for whatever expense the working out of these things may involve because they are all fundamental in the matter-of making of Americans.

(Loud applause)

Dr. J. H. Kellogg: I am sure we have all been greatly interested and instructed in the admirable address to which we have listened and I hope that the lofty and comprehensive ideals that we have set forth will so impress themselves upon the minds of all the students of this school that they will never be forgotten but will have a molding influence upon their lives. This school has now been in existence only a few years but it has been growing year by year and the attendance has been growing not only in numbers but, I trust, in quality and we have come here tonight at another annual commencement exercise for the purpose of bringing before the public the product of the work of this school. I am sure we ~~will~~ shall be glad to hear some words from Dean Hastings who is chiefly responsible for the school work.

Dr. W. W. Hastings: President Kellogg, members of the Faculty and

Senior class, Ladies and Gentlemen:

It seems fitting in presenting before you the members of the Senior class for graduation to say a few words with reference to one phase of leadership or one quality rather of leadership, namely, optimism. Lest I trespass upon your time more than seven or eight minutes I will confine myself as usual to a manuscript. "Optimism is the fruit of Faith." (reading paper)

(Applause)

Dr. J. H. Kellogg:

The speaker of the evening made this very clear to us, I am sure, that the world is waiting for a better type of man and a better type of woman. That is what we mean by race betterment, the bringing about of this better variety of man and woman. The world is waiting just now for a new human race and I sincerely hope that some of the members of this class will be among the forerunners of the pioneers of this new race. This is what this Normal School of Education is for, to train men and women for the new race and to send them out as missionaries of race betterment. The Faculty have recommended the following persons for graduation from this school. (Reading the names) By the authority of the Board of Trustees of this institution I take great pleasure in placing in the hands of each one of these graduates a well earned diploma. (Applause)

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A Stereopticon Lecture at the Sanitarium Parlor, Battle Creek, Michigan,

Thursday, August 27, 1914.

at 8:00 P. M.

by

J. H. Kellogg, M. D.

I am going to show you tonight a beefsteak that is five years old and is getting better all the time. It is not customary you know to eat beefsteak with your fingers. That is the way one ought to do it if it were natural food. One can take an apple and eat it without knife or fork or crack a nut and eat it without knife or fork. All the natural foods we can take just as they come from the hand of Nature and eat them but we have got to have a whole paraphernalia to disguise beefsteak so as to make it possible for us to endure it and I hope some of you will not be able to endure it when you get home. A lady said to me the other day, "Doctor, I am not going to eat any more pork anyway." I said, "Why not?" "Well", she said, "After hearing you talk about it I can't stomach it." Now the beefsteak that I have here is a demonstration of the value of the process of fermentation as an antidote for putrefaction. There are two ways in which all kinds of organic things, animal things and vegetable things, in which all of these living things are decomposed. One is fermentation and the other is putrefaction. Now there are three kinds of substitutes in animal and vegetable form, fats, carbohydrates and protein. Now protein is the albuminous substance such as the white of egg. Lean meat is protein. Gluten is protein. Fish and all sorts of lean flesh represent protein. Fat we are familiar with. It includes all kinds of oils, animal and vegetable oils. Starch and sugar are carbohydrates. These we are perfectly familiar with. Now starch, sugar and

fat ferment and when they ferment they form acids but albumin or protein, lean flesh, anything of that sort, when it decomposes, putrefies and forms ptomaines, toxins and poisonous substances, these are deadly. Some substances produced in this process of putrefaction are as deadly as the venom of snakes. Perhaps some of you know that the South American Indians dip their arrows in the decomposing flesh and when they shoot one of these arrows into a man or an animal the creature dies in a very short time. Now we are ready to deal with our beefsteak. First I want you to notice that this is tough. Well, it isn't quite so tough as I thought it was. You see it is pretty tough. It will tear but it is a good tough beefsteak of a healthy kind. Tender beefsteaks are not wholesome, are not healthy. A beefsteak gets tough when the animal dies. The flesh of a living animal is so tender that you can crush it by simply pinching with the finger but when an animal really dies and gets rigor mortis or death stiffening then the flesh becomes tough and it never becomes tender again until it rots. Now don't forget that. When beefsteak rots and is well advanced in decomposition they call it prime beef. Prime beef means simply rotting beef. The custom in Germany is to hang the goose outside of the door on the sunny side of the house and when the neck breaks and drops off then it is ready to eat. Now this beefsteak was just a little high when it was put in here but it has got all over it. It has a slightly acid odor and there is no taint about it and if you look at it closely you will see that it has a pink color of beefsteak, a little faded out because it has been in buttermilk so long. This shows that putrefaction cannot take place where fermentation is going on. Putrefaction cannot take place in the presence of fermentation. When there is active fermentation there can be no putrefaction and that is what we mean by a change of flora. We mean to get rid of the putrefaction flora that is raising havoc in the colon and is producing such an unsanitary condition there and produces putrid stools, horrible smelling gases and horribly loathsome bowel discharges. These putrefaction processes accomplish this. The same things that give a dead rat its peculiar nauseous properties, the very same germs are working in the colon when a person has a bad flora and these horrible germs

produce poisons which irritate the mucous membrane and produce colitis. Colitis is simply due to infection, to the presence of this putrefactive flora. Now when we talk about changing the flora we mean to get rid of these putrefactive germs and to get fermentative germs in their places, to get sour milks germs, germs that produce lactic acid, germs that produce acetic acid, to get acid-forming germs or fermentation germs introduced in the place of the putrefactive germs. That is not so easy to do always. Some people observe, when this change is going on, a good deal of gas and they complain about it. People often say I find your food often makes so much distention and gas. Now that is because the flora is changing. When fermentation is taking place there is always some gas produced. That is one of the characteristics of fermentation is the production of gas and that is to indicate that the change is taking place. This gas is a harmless, odorless gas. It is entirely different from those putrid gases that are produced when the putrefactive processes are taking place so much for the germ. I am going to change the subject and we are going to talk to you a little while about tobacco. I am not going to sing to you that very charming song about tobacco, a poem written by Charles Lamb a good many years ago. It was his lament, his farewell to tobacco. He used tobacco just as long as he possibly could and by and by his heart began to get bad and his kidneys were getting bad and his doctor said, "You have got to stop smoking or you will die quick" so he made up his mind he would have to stop and he wrote a poem, his farewell to tobacco and it began after this sort:

" For thy sake tobacco I would do anything but die."

And he was not quite ready to die for tobacco but there are some people that even go farther and are willing to die for tobacco. I met a man not long ago who said, "If I knew I was going to die a year or several years sooner I would smoke just the same because of the pleasure I derive from it is so great I think I could afford to suffer sacrifice a few years of life." Nobody but a tobacco smoker whose brain was thoroughly benumbed and besotted by this awful drug could express such a sentiment as that. The idea that for a mere animal pleasure considered from

the most generous standpoint possible, a mere animal pleasure, for a merely temporary thrill and tingle a man is willing to throw away several years of life without any consideration of the duty he owes to his country, of what he owes to his people and owes to his family, he is willing to throw his life away just for the sake of having a little pleasure. Well, Charles Lamb would not do that. He was willing to give up tobacco rather than die. A good many people come here in the same situation. They have gotten where they must do one thing or the other, they must die or stop using tobacco. That condition comes to every tobacco smoker sooner or later and there can be no doubt at all that every man who smokes, whether he is what you call a heavy smoker or a light smoker, these are entirely relative terms; what might be a light smoke for one man would be a heavy smoke for another, it makes no difference. He is shortening his life. He is doing something which is a damage to him, that he perhaps will never recover from. Here is the tobacco plant. It doesn't look so very dangerous, does it? But that plant furnishes food for no creature in the world except the tobacco worm. The tobacco worm can thrive on tobacco. The tobacco worm is provided with special means by which the nicotine and poisons are disposed of so that it does not appear to do it ^{any} ~~taxa~~ harm but man has a higher function in the world than to serve the purpose of a tobacco worm. He has something else to do so it would seem a perfectly proper thing to leave the tobacco plant to be eaten by the tobacco worm which can eat it with impunity. I have understood that goats can chew tobacco leaves without deadly effects but I am not so certain about it. Now everybody knows that tobacco is a ~~bane~~ ^{bane} for ~~beasts~~ ^{boys}. I don't believe there is a mother in the world but dislikes to have her boy smoke. I don't think there is an intelligent father in the world that is anxious to have his boy learn to smoke. I was talking the other day in New York City. I met quite a distinguished gentleman ^{there} at the Yale Club. I went down to have a consultation with the Panama Exposition authorities who asked me to prepare an exhibition for a Race Betterment Exhibition and I met a number of distinguished gentlemen there at the Yale Club and one of them that was sitting at a table got out a cigarette

and he said, "Well Doctor Kellogg, would you object to my smoking?" He knew I didn't approve of smoking and I said, "I am not afraid of anything except what I do myself." Nothing, I said, harms me except what I do myself. I thought he would take the hint from that and perhaps he would not smoke but these tobacco smokers get to be very obtuse. He made up his mind to smoke ~~th~~ just the same notwithstanding the hint I gave him that it would harm him if he did it. He said, "Well, now Doctor, of course, we all know that tobacco is not good." He said, "We old smokers, all of us, advise our sons not to smoke and we say to all the boys now don't smoke, don't smoke. It is a bad habit and you ought not to get it. It does harm to everybody. There is not a bit of doubt about it and he went right on puffing his cigarette just the same. It is admitted then by everybody that tobacco is bad for boys. Now why is it bad for boys? Tobacco is no worse for boys than it is for girls and no worse for men than for women. It is no worse for women than for men and is no worse for girls than it is for boys. It has just the same value for each one because it is a poison and almost a universal poison. It is a poison to all animals except the tobacco worm. I have heard it is not poisonous to the goat but I am not sure about that and it is poisonous to vegetables as well. That is a curious thing that has not been known so very well until comparatively recently but the smoker of tobacco will poison plants. It will poison ^{buds} ~~bees~~ that are just about to expand

The smoke of tobacco will poison plants, it will poison bugs that are just about to expand. It has to be used with great caution in the greenhouse by the greenhouse man. If he over does it when he kills his green flies with the smoke of tobacco, he hurts his plants as well very seriously. Now the reason why it is bad for boys is because it stunts growth and development. When a boy smokes, he is dwarfed, he does not get his full growth. Now think what a terrible poison tobacco must be if when a boy smokes a few cigarettes a day or two or three cigars a day, his growth is stopped. Now why is his growth stopped? Because tobacco is a deadly poison and it can be easily seen in the boy smokers in colleges and smokers in schools, in fact it has been proven again and again by statistical comparisons, that young men who smoke do not grow as rapidly, that there is a marked difference and this diagram shows it here. The weight of non-smokers was 24 per cent greater than the weight of the smoker. These were obtained at Amherst and at Yale by a study of the experience of Amherst College and of the Yale University. Now in the height it was found that smokers did not grow as fast as non-smokers. Non-smokers outstripped the smokers by 27 per cent and in chest ^{growth} ~~test~~ which is a very important vital measurement and a very important means of measuring one's vital capacity and vital power the chest growth increased in the non-smokers 42 per cent more than in the smokers. Then when we come to lung capacity, the lung capacity of the non-smokers increased 75 per cent more than the lung capacity of the smokers. Now these figures were obtained with students, with young men of about 18 to 21 years of age who were just finishing their development into manhood, just spreading out and expanding into their full manly development and the smokers were dwarfed. Now why were they dwarfed? Because nicotine and the other poisons that are found in tobacco are such bite poisons, such deadly poisons that they paralyze all the vital functions, all the processes of life are more or less damaged by them. The kidneys, the liver, the digestion, the heart action, the blood making function and every other function of the body is damaged by them.

But you say, "Why don't we see this effect in man; if this is true?" Because men have already got their growth. Men have already attained their maximum weight. This peculiar effect of nicotine cannot be manifested in men because men have already attained their full height and their full weight and have attained their full chest capacity and so there is no opportunity for this effect of tobacco, the poisonous effects of tobacco to be shown in arrest of development. It comes in a more subtle way in men, adults, men and women, all grown people have something which corresponds to this increase in size, to this growth which is known as margin of safety, that is what it is called. We call it a margin of safety in architecture, the boy is ~~ruined~~^{growing}, he is adding to his weight, he is adding to his height and adding to his growth, he is continually expanding and developing from day to day and by and by he reaches his full growth but now he does not stop with that full development but goes on developing for some time after he has obtained his full structure. Everybody knows that a boy of 21 although he may be as tall and large and weigh as much, has not the strength and has not the endurance of the man of 28, an why? Because this man of 28 has gone on developing after he has stopped growing in height, after his bones have reached their full length, he still went on developing, his muscles grew larger and stronger and firmer, his heart grew larger, the brain keeps on growing, in fact the brain keeps growing until about 40 years of age and his lungs are all the time developing and expanding and all the vital powers are increasing continually until finally they reach the maximum and that maximum is so great that it is far beyond the momentary needs of the body. For instance in lung capacity, lung capacity is about three hundred cubic inches, now when we take an ordinary breath and breathe in an ordinary breath if ~~you~~ we make a great effort, we can take in 100 cubic inches more and when we breathe out an ordinary breath we can then by an effort compress our lungs so that we can breathe out 100 cubic inches more, then after we have breathed out all we can, there is still left in the lungs, 100 cubic inches of air that we cannot get out, so you see we have three hundred cubic inches of air in

addition to the 24 or 25 cubic inches of air that we breathe out and and in. About 2/3 rds of a pint is the extent of the tidal air. We take in at each breath two thirds of ^{a pint air of} ~~the~~ air and breathe out about two thirds of a pint of air but we have in addition to that about 300 cubic inches more of air space in the lungs, at least 8 times as much as we ordinarily use. Well now that means that we have an enormous margin of safety. Why is that? Well that is ~~the~~ so we can run to catch a train sometime, that is so that we can hurry to get out of the way of cars, so that we can run up stairs or make violent exertions to save our lives or somebody elses life, or do something which it is desirable to do because when we use our muscles to their fullest capacity, we have to take into our lungs 7 or 8 times as much air in order to carry away the poisons in the body as ~~they~~ we do when we are lying still. 7 or 8 times as much air is taken in. Our muscles may increase their activity at least 10 times or one thousand per cent, they may increase their activity about ten fold and we have to have seven times as much ~~air~~ when we do that; we do not have to have ~~seven~~ ten times as much air because the air is used to a great ~~efficiency~~, utilization of the air is more efficient when we take a great deal of it during violent exercise. Well we have increased the margin of safety and the heart capacity. The heart is able to do 5 times as mush work as we ordinarily require of it. The liver is able to do many times the amount of work that is ordinarily required of it and the kidneys are able to do 15 or 20 times the amount of work ~~ordinarily~~ required of them, the skin is able to do in one hour as in a case of a man working hard in a harvest field on a very hot summer day, the skin will do as work in one hour as it ordinarily does in a state of rest in the whole 24 hours, so you see there is a great margin of safety in the skin. It can do 20 times as much work as is ordinarily required of it. So it is with almost every function of the body. There is enormously greater capacity for work that we are utilizing. An experiment was made with a dog sometime ago. The doctor put a tube down into the dog's stomach, then passed a stream of water into that dog's stomach and out ~~again~~ until he had taken out of that dog's stomach

a barrel full of water, and he found the amount of pepsin in that water was enough to digest a dog 20 times as big as the dog that made the pepsin. The dog had produced pepsin enough to ~~pre~~ digest 20 times his own weight of flesh. So you see what an enormous margin of safety there is, what a great margin of capacity. Now the smoker is not stunted in his growth because he has already got his growth but the smoker is damaged by the destruction, the using up of his margin of safety, that is where the smoker is damaged without knowing it, for instance, he has a heart capacity 5 times as great as he uses. Now he smokes and smokes and smokes and smokes ~~two~~ two or three or four or five or ten years, then if he is tested by an effort to run by running a race or by the necessity ~~by~~ for making a special effort of some kind he finds suddenly ^{short} that he is ~~out~~ out of breath. What is the meaning of that? The meaning of it is simply that he has lost half of his margin of safety. His heart now is able to do only two and a half times the ordinary work required of it ~~and~~ instead of five times the ordinary work. Now the same thing is true of the kidneys. Why, at the institution here we have a test that we call the renal efficiency test, by means of this test we can tell just how much work a man's kidneys are able to ~~do~~ do in comparison with the amount of work they ought to do, so in this way we can tell from the very beginning of the depreciation of the kidney structure and ~~function~~ function. Now when we test a smoker we always find his capacity has diminished, very often to 50 per cent of what it ought to be. Sometime ago we tested a man who had stopped smoking some years before, he had smoked but he had stopped smoking, he appeared to be in perfect health, he thought he was in perfect health but when we tested him we found his kidney capacity was only 50 per cent so he had lost half his margin of safety don't you ~~ea~~ see. More than half because a man ~~cannot~~ get along with only one third of his original kidney capacity, a man can live with two thirds of one kidney, that would be one third of his original kidney capacity, so when a man get down ~~to~~ to thirth three and one-third per cent, that is the minimum and the margin of safety, the other 67 per cent is

lost you see. This man had gotten down to 50, so you see he had used up all but 17 per cent of his safety margin. He has exhausted and lost three-fourths of his total safety margin, that meant that man would be an easy prey for Bright's disease, the time comes when some vital organ fails in every one of us and that is the reason why we die finally unless we die by accident, is that some one vital organ failed. We don't have a chance to go to pieces like the deacon's one horse shay as we ought to, that is the way we ought to die, the whole body go to pieces together but we die by the breakdown of some one vital organ, kidneys, liver, heart, lungs or some other one part. Now with reference to the lungs. A study of this subject at the Phipps Institute in Philadelphia, where hundreds of postmortem examinations are made of persons who die of tuberculosis every year, the records of this institution for the last 15 years have shown continuously and increasing every year have shown that tobacco users are more than twice to have tubercular consumption as persons who do not use tobacco. They find that tobacco users are twice as liable to consumption, to pulmonary consumption as non-smokers and you see the reason why. Here is a very plain indication of it that the lungs are damaged by the use of nicotine to such an extent that growing boys who do not smoke increase their lung capacity in a ~~year~~ years' time 75 per cent more than smokers do and consequently we may say that the smokers use up their safety margin 75 per cent faster than the non-smokers do and that is the reason why they get tuberculosis early. So I might go on with every organ of the body and show you how the safety margin is consumed by the use of tobacco and that is the reason why the smoker does not know tobacco is hurting him until he has been irreparably damaged. You see a man who is smoking, "well I suppose tobacco does hurt some but it doesn't hurt me. You know what is one man's food is another man's poison and so we are all different. Tobacco doesn't hurt me, Why, if tobacco hurt me, if I were sure it would hurt me, of course I have sense enough to know that I ought to stop and I would stop." Now you see that man is going right on using tobacco until all his safety margin is gone but he won't stop using

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tobacco until he finds his heart margin is all gone, until he is short of breath so as he cannot run to catch a train, or cannot hurry a little in going up stairs, to his office, he gets out of breath, then he begins to think something is the matter, then he goes to the doctor, the doctor, "You have cardiovascular renal disease". That is a good long word, isn't it? But it is very significant. Cardiovascular renal disease, the heart, blood-vessel and kidney disease, that is what that means, the heart is diseased, the blood-vessels are diseased and the kidneys are diseased, well there isn't very much left of that man, there is very little left in this world for him, he has got to die pretty soon, all the medical skill in the world cannot save his life, because his machine is used up, it is damaged and it cannot be repaired. All that can be done is to help him to eke out a crippled existence. Now what a terrible sacrifice that man has made, just to temporarily pickle himself with tobacco. He has thrown away his safety margin, a thing more precious than gold because it cannot be reproduced. Now here is a very important fact that I wish that everybody might know and I hope you will pass it on to those who do not know if you have an opportunity. It has recently been demonstrated that nicotine stimulates the activity of the of the suprarenal glands. These are glands located just above the kidney. I had to remove a kidney today which had become the seat of a cancer and I had to remove it and ^{attached} to the top of this kidney was a little cap that looked very much like an old fashioned Englishman's cavalryman's cap and it was called the suprarenal capsule.

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These suprarenal capsules are very important glands. It has recently been discovered that nicotine stimulates the action of these glands and causes them to secrete a substance which constricts or contracts the blood vessels. This substance raises the blood pressure. This substance is known as adrenalin and it is such a powerful substance that we find it of very great use. If you put a little drop of it upon the skin the skin becomes perfectly bloodless. The other day one of my ~~sisters~~ assistants telephoned me from the surgical ward that a patient had been brought in that was suffering from hemorrhage, a large bleeding surface, not a large blood vessel but a great number of little vessels were bleeding and I immediately telephoned him to put on some adrenalin, a towel saturated with adrenalin, This secretion which is from the suprarenal capsule. The hemorrhage stopped right away. There has been no hemorrhage since. It stopped immediately and we often use it for that purpose and find it extremely valuable. It is useful because it protects the blood vessels. Now it may do harm as well as good. When you have a hemorrhage it is a good thing to apply adrenalin to make the blood vessels shrivel up and shut up tight so that the blood cannot flow but that is not a good thing to have done on the inside of a healthy body. When this nicotine increases the formation of adrenalin so that it causes a contraction of the arteries, that makes high blood pressure and by and by hardening of the arteries, a condition known as arteriosclerosis and angina pectoris a very common disease in smokers. There was Mark Twain who smoked himself to death. He smoked all the time, went to sleep with a pipe in his mouth and the poor man was simply a victim of tobacco. He didn't die of overwork. He didn't have to work too hard. He was well to do. He was a man of leisure and could command his time and do what he liked but he smoked himself to death so thousands of men are doing that every year. Business men talk about their business being so heavy and they have to work so hard. The hard work they have is the elimination of nicotine, of the nicotine they are taking in. That is the hardest job they have. Many a man expends more vital energy in getting rid of the effects of tobacco, getting rid of the

poisons that he inhales through a cigar than he does in his business, a great deal more. High blood pressure is one of the most common results of tobacco using. Doctors all over the world are finding it out. They appreciate it now since it has been pointed out by the eminent French physicians who first investigated the subject so we know that every man that has high blood pressure his doctor tells him to stop smoking. Well, usually the man says, Now doctor, have I got to stop entirely? You know I smoke a light cigar." Well the doctor makes a compromise and says, "Well, you may smoke a very light cigar in the morning, not more than three times a day, as light a cigar as you can get." He does that to make a compromise. The doctor smokes himself perhaps and he doesn't dare to say at once, "No, you must not smoke a bit, you must not smoke at all. You must not associate with smokers because if you do you will have to inhale some of the tobacco smoke and that is bad for you. Second hand smoke is just as bad as first hand. Now see what happens to a man. Here was an experiment made. At the start he smoked a cigar and at the start his blood pressure was 120. Five minutes afterwards it had fallen a little because the first affect is to weaken the heart. Then it has zig zagged up and down a little for a few minutes and at the end of twenty minutes it was up to 130 and in five minutes more it was 135 and five minutes more it was 140. In other words, his blood pressure had gone up 20 points and that thing occurred in thirty minutes, twenty points in thirty minutes. Now that is the common affect of cigar smoke. A single cigar will raise blood pressure twenty points in thirty minutes but we see men with blood pressure way up to 200 smoking. It is a very common thing. A great many men come here still smoking and we find their blood pressure way up to 200 and they do not know that tobacco is doing them any harm at all. No one has ever told them. It is a most deadly drug. I received this advertisement the other day. I put it up here so that you will have an idea of what tobacco is good for. People say, "Well the Lord made tobacco. If He didn't make it to smoke what is it for?" So I received an advertisement from a man in Detroit the other day, "Not only will Thompsons Rose Nicotine made from tobacco, nothing but tobacco in fact, kill insects and parasites but it will eradicate rats and mice or any household

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vermin. All that is necessary is to put a few drops on a cracker and place in the proper place and away from children and valuable pets. The rat or mouse will seek water shortly after eating the cracker and consequently die outdoors. There is a rat eating a biscuit that is spread with Thompsons Rose Nicotine. It is his last meal but he doesn't know it. This shows the rat after the meal. Now we might have a man here smoking a cigar and it might be his last cigar but he doesn't know it and this might be after his smoke. That is the very thing that is happening all the while. Thousands and thousands of men and women are dying of the effect of tobacco smoking, not men and women in this part of the country but a good many in some parts, in Central America particularly. In Mexico women smoke almost as much as men. Now see what Justice Brewer the late chief justice of the United States Supreme Court says. "The cigarette is the American abomination. No cigarette victim can climb to the top of the ladder." The cigarette is more harmful than whiskey. I believe that is true. I believe that it is doing more real harm. Joseph H. Thompson, ~~MAN~~^{coach} of the football and track team of the University of Pittsburgh said that their athletes do not smoke. They are not allowed to smoke. They cannot smoke and hold their positions very long. "Only half as many smokers as ~~are~~^{non} smokers are successful in the try out for football squads. In the case of able bodied men smoking is associated with ~~loss~~ of lung capacity amounting to practically ten per cent. Smoking is invariably associated with reduction of scholarship in schools." Here is a quotation from Thomas A. Edison. "Found near my office door sweet Some degenerate retrograding toward the lower animal life has lost his pocket. He may have ~~be~~ same by calling on the store keeper. Thomas A. Edison. He stuck that notice outside of his office door. Here is another great inventor Hudson Maxom, inventor of the Maxom gun and many other things. "If all boys could be made to know that with every breath of cigarette smoke they inhale imbecility and exhale manhood, that they are tapping their arteries as they are letting their life's blood out as truly as though their veins were severed and that the cigarette is the maker of invalids, criminals and fools, not men,

it ought to deter them some. The yellow finger stain is an emblem of deeper degradation and enslavement than the ball and chain." That is that man's view of tobacco and he has a right view of it. Mr. Harriman said we might as well go to the insane asylum for our men as to employ cigarette smokers. Judge Ben Lindsey of Denver says, "The cigarette not only has a grip upon boyhood but it invites all other demons too, to come and add to the degradation. Seven billion four hundred and twenty-six million eight hundred and ninety thousand four hundred and three cigarettes were smoked in the United States in the year 1907. Think of that. Three billion, 41 million, five hundred and seventy-three thousand six hundred, six hundred and sixty-eight cigarettes were smoked in the United States in the year 1903, according to the report of the commissioner of internal revenue. Cigarette smoking is increasing at the rate of four hundred million a year. Fifty-five billion, four hundred and two million, two hundred and thirty thousand, one hundred and thirteen cigarettes were used in the year 1908 in the United States alone. See what an enormously rapid increase from three or four billion five years before to fifty-five billion ~~in-the-course~~ an increase of more than one thousand per cent. There is certainly something terrible in the way this habit is going in the world. In that great country of China that has recently been delivered from the opium habit, from this opium curse, by their own effort, by government edict for allowing the use and the raising of opium, Americans have ^{swa}fermed in there with cigarettes and are selling them all over the country and setting the whole population to using c igarettes with the belief that it is a harmless thing whereas it is a most terrible poison. ~~It is~~ A smog, ^{forgetting that} A man who smokes in public or in the presence of ~~non-smokers~~ A non-smoker who has equal rights. Prof. Burt C. Wilder of Cornell University. Prof. Wilder was a student of Aggasiz and one of the foremost scientific men of this country. He has made a careful study of this question. He knows what is in tobacco. He has nothing to do with it himself and he ^{has fought} ~~is-fighting~~ it most earnestly during the many years he has been a professor of science in Cornell University. He was in favor of forbidding its use. There are a few colleges in the United States

that forbid the use of tobacco by students, a few colleges. There ought to be more. This name that has been coined by Professor Wilder "smog" you can readily see its origin from smoker and another word that has in it "og". It seems a very appropriate name "smog" a man that smokes in the presence of non-smokers in a public place. What right have smokers to defile the air of our streets, parks, our public squares and our public places? What right have they to do it in a public place? If a man desires to smoke and smoke himself to death and will do it in private, he has a certain quasi right to do that so that we might not be able to interfere. I hope the time will come, however, when the government will interfere for a man is of value to a community and a community has something to say whether he shall commit suicide or not even if it is by what he considers a pleasant process of smoking. We ought to have laws that would compel smokers who will smoke to smoke in private secluded places. It is ashame that a man who detests tobacco cannot go into any public place without the liability of having great puffs of tobacco forced into his face and being compelled to breathe this horrible blast of poison. I believe we will some time get cigilized enough so that the smokers will be confined to their own precincts and the smoking in public will not be allowed. I think we ought to educate a public sentiment of that sort. We are gaining a little ground. There was a time when you could not ride in any car without being exposed to tobacco smoke but now the smokers must smoke in their own compartments and in their own cars. There is really getting to be some little sense of decency. There ^{were} ~~was~~ at one time laws against the use of tobacco in any public place, One of the old blue laws of Connecticut required that smokers as soon as he should see anybody coming down the street should immediately ~~sessit~~ retire to some secluded place or get out of sight. He was not allowed to smoke in the presence of another person on the public streets. I hope that everyone who is here will take hold and help us in this campaign for Race Betterment which is waging war against tobacco. We must educate men and women with the ~~believe~~ belief that men and women who learn the real truth about tobacco and its universal harmfulness and its absolute inability to accomplish any single good thing for anybody, in the hope that people who learn these facts

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will be glad to renounce the use of this dreadful drug. We always find people apologizing for tobacco. A man says, "Oh, I am nervous." I was talking with a doctor some time ago who said, "I smoke on my wife's account. When I don't smoke I am so cross my wife cannot stand me and I smoke to keep myself good natured enough so that my wife can endure me." I thought there might be some better remedy than that. Two or three doctors were smoking and they offered me a cigar and I didn't take it and I began to inquire of them why they smoked. One of them said, "I never smoked until I was forty and then I got a little throat trouble and the doctor told me smoking would help it and I am inclined to think it did. I still have it but I always feel better after I smoke. He hadn't been cured yet, you know. He was like the lady who recommended somebody's patent medicine. She said, "I can recommend it as very excellent for nerves for I have taken more than forty bottles of it" so he was continually cured but never got really cured. Another doctor said, "I had water brash and I am smoking for that." I told them it reminded me of a story I had heard told of an Eastern college where smoking was not permitted. The professor called around one evening and found a lot of boys in the room smoking. He smelled the tobacco coming out of the room. He came and knocked on the door quite loudly but there was a great silence and he rapped the second time. Then a timid boy said, "Come in." He came in. There was no tobacco in sight and there were no pipes in sight but the room was blue with smoke. He said to the first boy, "Why are you smoking sir?" He said, "Please professor, I had a terrible headache and I smoked in the hopes that it would relieve it." He said to the second boy, "Why are you smoking sir?" He said, "Please Professor, I had the sore throat and I smoked to help my throat." He came to the fourth boy and he couldn't have any very good excuses left ~~as~~ as they had all been used up so he said, "Please Professor, I have corns."

I thank you for your attention. END.

Address of Welcome to the Members of the American Electro-Therapeutic Ass'n

at the Sanitarium Annex Parlor,

Battle Creek, Michigan,

Wednesday, Sept. 15, 1914,

by

J. H. Kellogg, M. D.

Mr. Chairman, members of the Electro-Therapeutic Association:

I assure you it is a very pleasant task to welcome you here to this institution and to this city. We feel very proud that this national association has thought it worth while to come to this little country town to hold its annual meeting. We shall do our best to make it as pleasant as possible for you while you are here. I assure you that there is no place in the whole United States, perhaps no place in the world where you could be more welcome than at this institution. I hardly think there is any place where the work of this Association is more thoroughly appreciated and the principles that it represents are more daily utilized and appreciated than at this institution. I was just thinking as I was coming over from the operating room, where I was somewhat detained by an important operation, of the difference between the status of electricity today and of electro-therapeutics and of what it was forty years ago when I first began to study it. I remember very well when I finished my medical course at Bellevue College thirty-nine years ago last spring and began to look about for some way to make myself familiar with scientific electrical applications for therapeutic purposes I found it very difficult to find anybody who knew anything about it. I found a number of people travelling about the country giving instruction in cranial diagnosis by means of electricity but I finally discovered Dr. George M. Beard of New York City

and spent some months with him and had a very interesting experience. I worked with him in his office and at his dispensary. When I took charge of the institution here, after leaving New York, it was not a very large establishment at that time. I think we had twelve patients and two or three small wooden cottages. I should say, to tell the truth, that there were twenty patients the day I took charge but there were only twelve the next day, and you can draw your own conclusions as to the reason why. However, I brought in the first battery that was used on the premises of the institution. It was quite a curiosity and when it was found out by the doctors that we were using electricity in the institution it was looked upon as rather quackish. In fact, I found Dr. Beard himself was not in very good standing because he was using and recommending electricity and I heard electricity denounced a great many times as simply a species of quackery. The medical profession in general had no faith in it. It was only used ^{by} for a few scientific men and it was generally used empirically and, in fact, even Dr. Beard made some use of electricity in quite an empirical way. After I had gone through his booklet and finished the course of instruction in electro-therapeutics, he said to me, as I was leaving him, "Now, doctor, there is just one more thing I would like to say to you before you leave and that is, in the use of electricity for the treatment of the sick it is of the highest importance that the patient should have confidence in it; for if the patient does not have any faith it won't do him any good," and the way in which electrical applications were made in those days I think that was really true. We had no voltmeters or milliamperemeters. We had no means of knowing except by trying out the strength of our battery and, of course, it was necessarily the case that our work was more or less empirical. Tesla (?) came over a few years afterwards and brought his milliampere meter and he began to use electricity in a more scientific way. I remember a meeting of the International Congress that was held here and I think it must have been about twenty-eight years ago. There was quite a discussion in the gynecological session about the use of electricity for fibroid tumors. Tesla (?) read his

paper and two or three of us had been doing something with electricity. Dr. Massey had been using it in Philadelphia and Dr. Franklin Martin of Chicago and I had made a beginning here and we had a very interesting time discussing milliampere meters. One doctor, I think Dr. Martin, gave an account of applying over a thousand milliamperes to his patients and had not seen any very great results. On investigation by doctors who were a little curious and had not succeeded in applying such currents as that and insisted on knowing what kind of battery he had, In getting a description of the battery it ^{was} quite clear that the patient could not have had more than 75 or 100 milliamperes at most for the battery was not capable of producing so much as that, so we were wandering in the dark. I remember astonishing Dr. Massey once by turning on the current more and more and more until I had turned on about 1500 milliamperes and the patient still made no complaint. The ampere meter showed 1500 milliamperes but as we discovered some time afterwards the manufacturers had not yet found out how to callibrate the milliampere meters so the patient did not have really more than 250 at most. So we were wandering in the dark, and it has only been by the patient labors of such men as compose this Society that we have finally gotten to the point where we know something about what we are doing in these applications, and I think the time is certainly not far distant when the medical profession will give this branch of therapeutics still more generous recognition than it has yet received. Certainly none of us can complain that electricity is ignored at the present time for some of the most eminent therapeutists in the world are giving their whole time to the use of therapeutic measures based upon electricity. The development of the X-ray and the high frequency current has brought this form of therapeutics into very high standing everywhere. I think one reason perhaps why progress is more rapid than in the early days is because we have been so much accustomed to look abroad for all progress instead of working out our own progressive measures, but in electricity at least we certainly have a good deal

to be thankful for. We do not forget that it was one of our distinguished fellow countrymen who first harnessed the lightning and reduced this wild element to a tame condition, so to speak, which make it possible for us to utilize it, but it has taken the labors of many hundreds of men to get the lightning thoroughly tamed and bring it to a point where it can be actively, practically and safely employed. I think perhaps sometimes we forget too that the high frequency current for which we are very grateful for accomplishing such great results really was first observed in this country. I remember an afternoon I spent with Mr. Edison some thirty-eight years ago in his laboratory at that time at Newark, N. J. I had an opportunity to see Mr. Edison again last winter and I found he remembered the incident very well. He had been working all the night before and was working still in the morning. He was anxious to make a study of a new current which he discovered which he called the Odyllic (?) which was very peculiar. He afterward called it the grasshopper electricity. At that time the only thing known about it was that it travelled through the air. He fixed up an arrangement of a coil about two feet square with a little point in the center of it and another coil of the same dimension nearly ten feet away and he was able to show that he had a current of some sort that would leap from one of these electrodes to the other through the air, a distance of ten feet. The question he was interested in was to find whether this current had any heating power. He labored for several hours and he did not discover that it had any heating properties and whatever, and we were talking the experience over last winter with Mr. Edison and he remarked, "Yes, I discovered the high frequency current but I was so busy I did not have time to follow it ^{up} but so others took hold of it afterwards and developed it." So the first observations of the high frequency current were made in this country and it is only because Mr. Edison had so much on his hands in the development of the electric light ~~that~~ that this current was not developed in this country. However,

However, we owe to Mr. Tesla of New York a great deal of the development made in this line. Now we know the high-frequency current is a most potent means of applying heat to the interior of the body; but I must not occupy much of your time.

I assure you we are very grateful to have you here and feel very proud that you are able to feel at home in this institution, and we hope you will. Perhaps if you had been here thirty years ago, you could not have felt so much at home. I just recall an experience I had thirty-one years ago when I was called before my County Medical Society and put on trial because I was endeavoring to develop a new school of medicine known as "rational medicine." It was charged against me freely. We happened to have some narrow-minded men in the profession who thought the use of electricity, water and other natural therapeutic means was so quackish that I ought not to be tolerated in the society; but after a couple of years investigating the matter in which every three months we had a meeting and I had a chance to ventilate the subject, the final vote taken on my case left me in the society. I am obliged to confess, however, it was only one vote that kept me in and that vote was my own vote. However, we had a chance to ventilate the whole question of therapeutics pretty thoroughly and the next year the society was so thoroughly converted that they elected me president of the society by a unanimous vote, so I have been comparatively regular or orthodox ever since. We certainly had some trials in those days because these natural therapeutic means have found their way into the profession from the laity.

It is a peculiar thing that so many of the natural means of therapeutics have come from the laity instead of from scientific laboratories, but I think we have got beyond that stage and at the present time the new developments come from the laboratory as they ought to and come by a road which leads to their more prompt recognition than in olden times.

I am very glad to welcome you here and hope you will feel entirely at home and if you find some things missing here that you are accustomed to, we

will try to make up in other things that may be agreeable.

I thank you.

Chairman: Gentlemen, I am sure we appreciate this ~~welcoming~~^{is guests} and the opportunity we have had of coming here as Dr. Kellogg suggests. Certainly it is a great mark of appreciation of this society and I assure you it is a great privilege ~~as~~ we have of being here. It is a privilege to have met a man like Dr. Kellogg who can stand up before you here and talk about electricity and electro-therapeutic measures and physical methods as though he was devoting his entire time and attention to them. However, you find the greatest surgeons of the country come here to see him operate, and with the same idea that he is devoting his entire time to surgery. Then if you have the opportunity that I have had of talking with him about metabolism, etc. and have him show you through the laboratories he uses for the metabolic studies, you will be convinced that he must be devoting his entire time or a great deal of it to this subject of diet, and when you realize that with all that he has managed and developed this wonderful institution, all of which is moving smoothly and in which there is a general feeling of satisfaction by patients and workmen, you are bound to admire and respect the accomplishment.

End.

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Oct 12 1914

WHY LAUGHING IS AN AID TO DIGESTION.

Gentle exercise is beneficial to good digestion. Digestion is a very complicated process. There are two essential things. First, the mechanical action upon the food, and the second is the chemical action upon the foods. The hand puts the food into the mouth. Then the teeth masticate the food, chew it, to reduce it and grind it. Then it is swallowed. The saliva continues to act upon it in the stomach. Then the stomach must manipulate it, mix it, move it on into the small intestine and dole it out, a teaspoonful at a time as it is prepared for the work of the small intestine. It is then moved along to the small intestine and at the end of eight or nine hours it comes down to the colon and when it gets there it has lost its nutritive properties. All the useful elements have been absorbed, practically all, and it has been reduced in bulk. The small intestine absorbs, during the course of the day, five or six quarts of liquid, whereas, the material that enters the colon is only about seven or eight ounces and of this seven or eight ounces half of it is absorbed. Nine-tenths of it is water absorbed by the colon so the work of the colon is only to absorb about three or four ounces, whereas the small intestine absorbs more than as many quarts. When food is being acted upon it must be moved along. This moving of the food from place to place along the alimentary canal is the work that is done chiefly by the intestine itself but in part it is done by the diaphragm. The stomach lies just underneath the diaphragm. The diaphragm is simply a little thin muscular partition. The heart is on one side and the stomach is on the other side. It is the action of the diaphragm to move up and down upon the stomach. As we draw in a breath, the diaphragm is pressed down and presses upon the stomach so the contents of the stomach are churned by the process of breathing and if one breathes vigorously this churning movement is quite vigorous. If one breathes very slowly and superficially then the action of the diaphragm upon the stomach will be very little and it is for this reason that when people go to sleep, directly after eating, food remains a long time in the stomach because the breathing is repressed to such a degree that

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when we are asleep the food remains in the stomach nearly twice as long as when we are awake. The effect of exercise is to increase the action of the diaphragm. That perhaps is the reason why we have an old adage, "Laugh and grow fat." Cachination is the best thing in the world for digestion. When one laughs, for example, every time he says the syllable ha, every ejaculation in the laughing, there is a little movement of the diaphragm. It is just simply hopping up and down on top of the stomach and shaking up its contents. A hearty laugh is a splendid aid to digestion, not simply because there is a pleasant state of mind, which makes the condition favorable for all the functions of the body, but because there is this actual mechanical aid to digestion which comes from laughing.

An hour after dinner exercise again. We used to begin our after dinner exercise with a laughing exercise. About 25 or 30 years ago we had a very few patients with us, but we had one patient who weighed something like 375 pounds and he was rather short and very large around and he had a splendid hearty laugh and I used, after dinner, to get him to sit upon the platform and then I stood up there and directed the laugh. I said, "Now then we will all laugh", and our good friend would begin to shake his sides and that would set everybody laughing very vigorously so we had an after dinner laugh. We told a few stories and then we would all practice on laughing. "Now prepare to laugh," for instance, I would say. "Now get all ready." We are going to laugh in just a minute", and everybody would begin to laugh immediately at the idea of laughing and then our good friend would lead the laugh and it was really funny. We had very happy times. Well, our fat gentleman went away and we didn't have anyone here to lead the laughing so we had to do the best we could and substitute something else so we introduced these regular after dinner exercises which we now have and modify from time to time. It is only very light gymnastics, the purpose of which is to stimulate respiration, to get the lungs to working heartily and vigorously, the diaphragm shaking up the stomach and the effect of this is not only to move the stomach and so facilitate the movement of the food out of the stomach into the intestine, but also to withdraw the blood from the stomach and liver and these other internal organs for when the

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lungs expand to suck in the air, it at the same time draws in blood. When the chest draws

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lungs expand to suck in the air, it at the same time draws in blood. When the chest draws

Cucumbers need to be very thoroughly chewed because they are not digested in the stomach. The cucumber has nothing in it that the stomach can act upon and the same thing is true of apples. Some people can not eat bananas without disturbance. It is because the banana has nothing in it that the stomach can act upon and, also, because these things are swallowed whole, so to speak, that they make trouble. If one swallows an apple without thorough mastication, it lies around in the stomach a long time. A great many people can not eat the apple, they say, because it gives them sour stomach. Apples have firm flesh and the hasty eating of such substances leaves large chunks and masses in the stomach which cannot get out and so are retained there a long time irritating the stomach and setting up the formation of an excess of acid. The same thing is true of the cucumber and the banana, but if the cucumber is reduced to an absolute pulp if the apple is chewed to a pulp or scraped with a knife before you eat it, or if the banana is reduced to pulp, mashed with the tongue against the roof of the mouth and made^a complete pulp before it is swallowed, or any of these substances are put through a collander before eating, then there is no trouble. The most delicate stomach will digest them without difficulty. Cucumbers, apples and all kinds of things agree well together in a liquid state. The important thing is to get them into a liquid state. Even babies thrive well on bananas if they are put through the collander and all the particles are removed. The banana is a very easily digestible food because it has nothing for the stomach to do and passes on into the intestine, being all ready for absorption in large part.

Cucumbers need to be ^{very} thoroughly chewed, because ~~that is the reason.~~ ^{that are not digested in the stomach} The cucumber has nothing in it that the stomach can act upon and

the same thing is true with ^{of} apples. Apples contain nothing that the stomach can act upon. ^{Some people can not eat bananas without disturbance.} You have heard about bananas being such a very dangerous thing for some people

to eat. It is because the banana has nothing in it that the stomach can act upon and ^{also} it is because these things are swallowed whole, so to speak, that they make trouble.

If you swallow ^{one} the apple without thorough mastication, it lies around in the stomach a long time. A great many people can ^{not} eat ^{the} apples they say because they give ^{it} them sour stomach, and ~~the~~ apples have firm flesh and the hasty eating of such substances leaves

large chunks and masses in the stomach which cannot get out and so are retained there a long time irritating the stomach and setting up the formation of an excess of acid.

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kinds of things, sweets and ^{well} ~~everything else~~ agree together in a liquid state. ~~That is~~ the important thing, ^{is} to get them into a liquid state. Then there is no particular trouble

^{Every} Babies all thrive well on bananas if they are put through the collander and all the particles are removed. The banana is a very easily digestible food because it has nothing

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IRON NOT A BLOOD REMEDY

The idea formerly prevailed that iron was a great thing to increase hemoglobin, the coloring matter of the blood, and it is possible that iron does have a little influence that way, but not very much. So it was once the custom to feed people iron filings and all kinds of iron preparations. People traveled long distances and still do to drink the water from so-called "iron springs." There is little or no good from this use of iron. In fact, there is a good deal of harm, because the mineral iron taken in this way is captured by the liver and held in it. It is possible that a little of it may be utilized but the real trouble is not that there is lack of iron in a person's food; that is not the cause of a lack of iron in the blood. The reason is, that there is a disturbance in the metabolism of the body so that the iron of the food is not utilized properly. That is the real cause and that is the thing to be remedied. It is not necessary to give the patient more iron, but to get him to make use of the iron in his food, to make a proper assimilation of it. There are many things that do that. Outdoor life and sunshine have a marvelous effect in increasing the hemoglobin. Every one knows what happens to flowers if they grow in the shade. If a potato sprouts in the cellar and you bring it out, it is perfectly white; if you expose it to the sun's rays, in a few days, the white sprouts become green. The sunlight is necessary for the development of chlorophyl. Hemoglobin is to the blood in the body what chlorophyl is to the plant: that is, red coloring matter is to animals what the green coloring matter is to plants, and its growth is facilitated in the body by sunlight, just as the growth of the green chlorophyl in the plant is facilitated by the sunlight. Miners who work deep in the underground passages of the earth become pale. Flowers grown down in these dark places have very little color. The leaves are pale and in exactly the same way that plants are influenced, human beings and animals, except those that by nature are adapted to this life in the dark, are also effected. Sun bathing and outdoor life are the best means for making hemoglobin. When one goes out into the sun, the skin gets tanned a brown color. This

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influence of sunlight is not simply upon the surface of the skin; the coloring matter is formed and developed deeper in. The sun's rays strike down in and perhaps penetrate for an inch or two into the soft tissues, so the influence of the sun is felt on the interior of the body as well as on the outside. Another thing that is very beneficial is exercise. It is highly beneficial, for exercise encourages the movement of blood through the body. Blood is produced in the bones. The marrow of the bones is the place where the blood is formed. The circulation of the blood through the bones can be increased only through the use of the muscles. A single blood vessel brings down the blood for bathing the muscle underlying the bone. If the muscle is active, the amount of blood circulating through it may be five or even ten times as great as that circulating through the muscle when it is idle, and consequently the amount of blood circulating through the bone will be proportionately increased because of the larger amount of blood that is brought to the limb as a whole. It is apparent, then, that exercise is one of the most important of blood-making agencies.

Dr. Hurter of New York, who is an eminent bacteriologist and a chemist also, made the very interesting discovery that with people who have too little blood, the chief trouble is not, in the majority of cases, that they do not make blood enough and do not have iron enough, but the chief trouble is that the blood is destroyed too rapidly.

Lord Bacon, the philosopher, believed that everybody needed to have their blood changed once a year. He had the idea that the blood got old and required changing, so he recommended that everybody should be bled once a year and it was quite the custom in his day, and even now, in going through some parts of old London, you will see a sign out, "Hair cutting, leaching and bleeding done here." The barbers were at one time the surgeons. Some of the most eminent surgeons of the middle ages were barbers as well as surgeons. Lord Bacon thought the blood must be changed once a year, but nature changes the blood every six weeks. Nature does not wait for springtime to come before she changes the blood. That would never do. A blood corpuscle gets its development, grows old and dies

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and is disposed of. The dead cell is disposed of in the liver and the spleen which are sort of cemeteries for dead blood cells. The blood goes through the whole cycle about once in six weeks. When a person is suffering from anemia, it is because the blood corpuscles do not last the whole six weeks. The corpuscles are disposed of more rapidly than they ought to be. One cause of this rapid destruction was found by Dr. Hurter to be poisons produced in the colon. It was a very simple experiment that proved this. Dr. Hurter observed in studying a large number of cases of pernicious anemia, some twentytwo cases in all, that there was one germ always present in great numbers in every case, so he cultivated this germ. He put some blood into the culture with these germs and within a very short time, the blood was all dissolved. The cells were all destroyed. Certain mechanical poisons are produced by these particular germs. It is these which dissolve the blood cells.

BEAUTY and RIGHT LIVING.

It is impossible to be beautiful without being healthy. Health is the foundation of beauty. If one wants to be really beautiful, the beauty must be more than skin deep. The trouble with most people is they are quite satisfied with a beauty that is superficial enough to deceive the onlooker. Beauty means vigor and efficiency.

To be really beautiful one must be beautiful throughout; not only have a beautiful face, but beautiful hands as well and not simply have a good complexion for the face, but a good complexion all over. Not infrequently there are persons whose body is all covered with pimples. If such blemishes were on the face, they would feel very badly about it, but so long as they are out of sight they don't mind it. However, it means the same thing, as if they were face pimples. It means that the whole body is in a state of uncleanness and low resistance because of this uncleanness. The only way to be really beautiful is to live beautifully, to live rightly. That means to live naturally. If one is aiming to be beautiful, for example, one must eat beautiful things because our bodies are made of what we eat. If one eats corpses, how should she expect to be beautiful. But if one eats the beautiful fruits and nuts that are hung from the trees inviting us to reach up and partake; if one eats these natural foods that Nature has prepared for us, that are all pure and sweet and good and clean, then she may have natural, clean blood and the result of good clean blood will be a clear skin and a good complexion. A lady asked me a good many years ago what was good for her complexion and I told her oatmeal. She said, "Do you mean rub it on?" "Yes", I said, "Rub it on and rub it in and swallow it." One does not admire brown circles under the eyes and patches on the hands and leather-colored skin. Behind that leather-colored skin is a bad breath. Behind that bad breath is impure blood; blood charged with those same offensive aromas that are coming out of the mouth. They come from the body into the lungs and then they get into the breath and the blood has to take on itself the putrid effluvia and

dispose of it somewhere. It finds it in the colon and so as the blood comes around to the colon these putrescent odors are absorbed, carried to the lungs, poured out into the breath, and not only poured out into the breath but polluting the whole body. It is not only the breath that smells bad but the whole body smells bad. The perspiration has an offensive odor for the same reason. It is loaded with foul, putrescent materials that ought to be carried out through the bowels but are escaping through the lungs, the kidneys and the skin instead. After filtering through the whole body it is natural that the whole body should be polluted. One of the greatest of all causes of lack of beauty is this chronic autointoxication and that is the natural result of stagnation in the colon.

VEGETARIANISM and AUTOINTOXICATION.

Some people have an idea that a person who is not a meat-eater could not possibly get into a state of autointoxication, but he may.

One may be a vegetarian and yet live very unwholesomely in many ways. The real cause of autointoxication in any case whether a person is a vegetarian or a non-vegetarian is constipation or stagnation. It is such a long delay of food residues in the intestine that there is opportunity for putrefaction and the absorption of these putrefactive poisons into the blood. Vegetable food consists of protein, starches and fats. The starches generally are all absorbed, practically, and the fats are nearly all absorbed but there always remains behind a part of the protein. In the case of vegetable foods the amount of protein which remains behind may be even larger than in the case of animal foods, provided one in eating animal food eats very sparingly. For instance, one eating beans or other food rich in protein may have a larger residue of protein escaping from the body than a person eating meat in moderation; so a vegetarian may have a large amount of protein left behind in the colon to undergo putrefaction and if there is an inactive state of the bowels, putrefaction will occur, not so easily as in the case of a meat eater, but still it will occur. The bile, also undergoes putrefaction and the mucous produced in the intestine undergoes putrefaction and the pancreatic juice and the remains of other digestive fluids all undergo putrefaction in the intestine; so a vegetarian may be exposed to the causes of autointoxication as well as the non-vegetarian.

In general, a good rule to follow is to eat only when one is hungry. Work until you are hungry. If you do not feel hungry at dinner time, don't eat simply because it is dinner time. The proper time to eat is when hungry. If one eats twice as much breakfast as he ordinarily does, he ought not to eat dinner so soon. The amount of time necessary to digest the meals depends very much upon the size of the meal. A very small meal may be gotten out of the stomach within an hour, whereas, a large meal might remain in the stomach some seven or eight hours.

And the quality of the food also makes a difference. If one eats a great deal of fat, it would stay in the stomach a much longer time than food that contains little fat, because fat is one of the slowest things to get out of the stomach. If one does not chew the food properly, the unchewed food is likely to remain in the stomach for a long time. That delays greatly the emptying of the stomach, so one must give thought to his condition every time before sitting down to a meal. Never eat because it is time to eat; never eat because somebody offers you something that looks good; never eat unless you are hungry. It is just as foolish for one to eat when he is not hungry as it is for one to drink when not thirsty. Hunger is a bodily instinct which calls for food and if any one does not have a call for food, why he should not eat. Doubtless a good many people eat to have a good time. They eat to have fun with their palates, if you please, to play music on the gustatory nerves. That is abusing a very important sense which is given us to regulate our nutrition and to tell us when to eat and when not to eat. We do not listen to it when it says not to eat. We crowd ourselves. Six o'clock dinners, by the way, are a terrible curse to the country. Thousands of people become invalids, become afflicted with insomnia and break down in health, simply as a result of these heavy six o'clock dinners. The last meal should be very light because one can not digest well when he is asleep, and he cannot sleep well while he is digesting and the stomach works very slowly.

Question Box Lecture at the Sanitarium Parlor, Battle Creek, Michigan,

October 12, 1914

at 8:00 P. M.

by

J. H. Kellogg, M. D.

Q. Is it well to take exercise immediately after eating?

A. I suppose this question was prompted by the fact that you are invited to the gymnasium every morning directly after breakfast, then after dinner and after supper and several times between. I remember a gentleman sometime ago from Chicago who declared he had done more hard work since he had been here than he had done in fifteen years before. He said he came here to rest for ten days but he said, "You have made me do more hard work than I have done in fifteen years." This exercise is not intended to be hard work. Those of you who enter into it find you can make it hard or as light as you please. Work that is done by the special apparatus at other times than the general exercises is sometimes rather strenuous but that is adapted to each individual person but the exercise after breakfast and the exercise after dinner and in the evening after supper is not of such a character as to be in any way prejudicial to good digestion. In fact, gentle exercise is beneficial to good digestion. Digestion is a very complicated process. There are two essential things. First, the mechanical action upon the food. That is the first thing and the second is the chemical action upon the foods. The hand puts the food into the mouth. Then the teeth masticate the food, chew it, to reduce it and grind it. Then it is swallowed. The saliva continues to act upon it in the stomach. Then the stomach must manipulate it, mix it, move it on into the small intestine and dole it out, a teaspoonful at a time as it is prepared for the work of the small intestine.

Then it is moved along to the small intestine and at the end of eight or nine hours it comes down to the colon and when it gets to the colon it has lost its nutritive properties. All the useful elements have been absorbed, practically all, and it has been reduced in bulk. The small intestine absorbs, during the course of the day, five or six quarts of liquid whereas the material that enters the colon is only about seven or eight ounces and of this seven or eight ounces half of it is absorbed. Nine-tenths of it is water absorbed by the colon so the work of the colon is only to absorb about three or four ounces whereas the small intestine absorbs more than as many quarts. When the food is being acted upon it must be moved along you see. Now this moving of the food from place to place along the alimentary canal is the work that is done chiefly by the intestine itself but in part it is done by the diaphragm. The stomach lies just underneath the diaphragm. The diaphragm is simply a little thin muscular partition. The heart is one side and the stomach is the other side. The stomach seems even closer to the heart than that in the case of some people but there is only about one quarter inch between the stomach and the heart anyhow and it is the duty of the diaphragm to move up and down upon the stomach, at least that is its action. As we draw in a breath the diaphragm is pressed down and presses upon the stomach so the contents of the stomach is churned by the process of breathing and if one breathes vigorously this churning movement is quite vigorous. If one breathes very slowly and superficially then the action of the diaphragm upon the stomach will be very little and it is for this reason that when people go to sleep, directly after eating, food remains a long time in the stomach because the breathing is repressed to such a degree that when we are asleep that the food remains in the stomach nearly twice as long when one is asleep as when he is awake. The effect of exercise, you see, is to increase the action of the diaphragm. That perhaps is the reason why we have an old adage, "laugh and grow fat". Cachination is the best thing in the world for digestion. When one laughs, ha ha haaaa, for example, every time he says that syllable ha, every ejaculation in the laughing,

there is a little movement of the diaphragm. It is just simply hopping up and down on top of the stomach and shaking up the contents of the stomach so a hearty laugh you see really helps digestion. It is a splendid aid to it not simply because there is a pleasant state of mind but there is something more than that. In addition to the happy frame of mind which makes the condition favorable for all the functions of the body, there is this actual mechanical aid to digestion which comes from laughing. An hour after dinner exercise again. We used to begin our after dinner exercise with a laughing exercise. About 25 or 30 years ago we had very few patients with us but we had one patient who weighed something like 375 pounds and he was rather short and very large around and he had a splendid hearty laugh and I used, after dinner, to get him to sit upon the platform and then I stood up there and directed the laugh. I said, "Now then we will all laugh" and our good friend would begin to shake his sides and that would set everybody laughing very vigorously so we had an after dinner laugh. We told a few stories and then we would all practice on laughing. "Now prepare to laugh;" for instance, I would say. "Now get all ready. We are going to laugh in just a minute" and everybody would begin to laugh immediately at the idea of laughing and then our good friend would lead the laugh and it was really funny. We had very happy times. Well our fat gentleman went away and we didn't have anyone here to lead the laughing so we had to do the best we could and substitute something else so we introduced these regular after dinner exercises which we now have which are modified from time to time. It is only very light gymnastics the purpose of which is to stimulate respiration, to get the lungs to working heartily and vigorously, the diaphragm shaking up the stomach and the effect of this is not only to move the stomach and facilitate the movement of food out of the stomach and into the intestine but also to withdraw the blood from the stomach and liver and these other internal organs for when the lungs expand to suck in the air, it at the same time draws in blood. When the chest draws

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in air from above it draws in blood from below and this is true to a very remarkable extent. You have no idea what a great force unless you have seen, at some time, an experiment which relates to this physiologic action. You have no idea what tremendous power the lungs have in drawing blood to the part. I happened some years ago to be removing a large cancerous tumor from the axilla of a patient. It was grown fast to everything and in removing it I had to dissect it off the large veins of the arm. It was grown right fast to the large veins and as big as your little finger or larger. I found this particular vein collapsed with each breath so I had to time my movements with the patient's breathing and make my little cuts between his breaths and make my dissection rhythmically. It was very interesting indeed to see those large veins collapse completely every time the patient took a deep breath and I knew if I should open one of those things veins with my knife it would suck in a volume of air into his heart that probably would end his life in a few minutes. so it was a very interesting operation. Now if you try an experiment you can realize this to some extent yourself. If you put your hands out in front and then take a very deep breath, just as deep as you possibly can, you will find a sensation that travels right down the arms. At the very last moment you will feel that pull go clear down your arms because the lungs, in drawing in the air, so forcibly from the fingertips and from the toes and from every part of the body, this suction action of the chest upon the blood is especially active in relation to the liver and that is very important because here is the liver lying right under the diaphragm and all the blood from the stomach and from the intestines and all these great abdominal organs must pass in through the liver before it can get back into general circulation and it is very likely to be a little sluggish and especially if one has eaten a pretty large dinner or has a very small stomach. If one has a tired out weary stomach that has too much to do or has a worn out, a sort of gone on a strike stomach, such a stomach gets slowed down very easily and many persons who suffer in this way, who have a very

heavy feeling after eating, feel as though they had a load of lead in their stomach, this heavy distressed feeling is due to too much blood in the stomach, at least too much for that particular stomach. Now, I notice immediately after I started these after dinner exercises that patients began to say, "Why, I feel so much better after this exercise. That heavy feeling I used to have, that used to last an hour or two is all gone. When I come out of the gymnasium I cannot find it. It actually has disappeared" so I found I was working physiologically in the right way, that the physiologic principle was holding good, that by increasing the force of the breathing exercises we were pumping the blood out of the liver, pumping it out of the stomach and as we pumped the blood out of the stomach and liver and intestine that aided absorption so that the whole process of digestion went on more rapidly and not only the movement of food along the intestine that is passing out of the stomach into the intestine more rapidly and along the intestine more rapidly but the absorption was more rapid so this heaviness and distress was overcome. These exercises after breakfast and dinner are not hard enough to be called really work but are simply diversion, simply a little gentle bodily movement just sufficient to stimulate respiration moderately but not increase enough to make any extraordinary demand upon the body which would interfere in the smallest degree with the process of digestion. Hard work, particularly after eating, is not to be recommended although I must tell you that the latest experiments that have been made upon this subject have reversed the old ideas with reference to work. In VonNoorden's recent work on metabolism he gives the result of the latest experiments upon the effect of exercise upon digestion. It is shown by a large number of experiments that digestion is not apparently influenced at all even by the hardest kind of exercise, that men working very hard and eating very heartily assimilated their food as thoroughly and as readily as though they had not been engaged in exercise at all. I was rather surprised at this because I supposed the old experiments

made upon dogs some years ago were really to be relied upon.

Q. Is the breaking up of adhesions of the pelvic colon a serious operation? How do you prevent new adhesions from forming?

A. Well, I don't know where this question comes from but imagine that there are quite a number here who have seen the reports from the X-ray department in reference to their particular cases or the case of someone in whom they are interested and so have discovered that it is a frequent thing to have reported from the X-ray department that adhesions of the pelvic colon are present. Now suppose this represents the colon and this is the pelvic colon. The pelvic colon falls down when it is empty and as it fills it gradually rises and when it rises up in this way it is able to discharge its contents into the rectum and so out of the body. When the pelvic colon is empty it collapses and falls down in this way and when down in this condition if there is an inactive state of the bowels and the contents of the colon are putrefactive and virulent, such a flora as one has who is a flesh eater, for example, one eats hearty meals of meat, the undigested fragments of meat lying about under going decomposition in the intestine, putrefactive bacteria will grow very abundantly and under such circumstances there is likely to be set up here in this prolapsed colon an inflammation and this inflammation known as colitis and this will lead to the formation of adhesions which in turn will form kinks so that the passage of material through this part of the bowel is very much interfered with. Now our experience here is that in least nine cases out of ten all cases of chronic inactivity of the intestine, chronic constipation, in nine cases/^{out} of ten the real trouble is down here and this trouble leads to other serious troubles. There is a damming back and as materials crowd back stasis or constipation occurs; then colitis is developed. The infection travels up and colitis is developed all along until it sometimes gets clear up to the small intestine, then over here as we found in a case we were operating on today. The intestine is very much dragged over but becomes greatly dilated and as it is dragged down in this way the ileocecal valve is pulled upon. This is a little opening which

under ordinary circumstances just about admits the little finger and that is called the ileocecal valve but in the manner I have told you the valve is stretched until it remains open so that the fecal matters from the colon can pass back up into the small intestine and then troubles begin in the intestine. It comes clear up here to the stomach and even up to the gall-bladder and the liver and gallstones are formed and ulcers are formed in the duodenum and in the stomach itself, sometimes as a result of this infection travelling back so these adhesions of the pelvic colon and the colon are really a very serious matter and it is almost useless to operate upon troubles in the upper part of the alimentary canal unless we correct this difficulty from below for this is where the difficulty really starts. The colon becomes infected. The ileocecal valve is destroyed and the appendix becomes diseased, appendicitis occurs and probably the appendix will be removed if the patient is not any better. Some of your friends have had an operation for appendicitis and thought they were going to be perfectly well and happy afterwards and did not feel very much better than they were before. They were perhaps free from the acute attacks but the general trouble from which they suffered was just about as bad. Now the question as to whether this is a dangerous operation, I am glad to say no. The other question was, how can the reformation of adhesions be prevented? That really has been a difficult problem. I would not dare say that we have solved that problem absolutely and completely but certainly we are making progress. We have had really very good success in adopting a very simple plan which consists simply of breaking up the adhesions, putting the colon into position and fastening a rubber stomach tube passing it up into this part of the colon so it is under control; then attaching this part of the bowel to the abdominal wall that holds it there lightly. This holds it into position until the adhesions which formerly existed have been covered over in some other way leaving the bowel up in a position in which it can act where its function will not be interfered with. We have had occasion to do this operation for a great number of times and it affords relief. Patients who have been unable to discharge the

contents of the colon find themselves quite relieved of this embarrassing difficulty.

Q. Will Colax and Para-Lax keep for any length of time?

A. Yes, for an indefinite period.

Q. What relation has health to beauty?

A. It has a great deal of relation. In the first place it is impossible to be beautiful without being healthy. Health is the foundation of beauty. I do not consider it a trifling question at all but I consider it really a very important question and a very proper question. A lady asked me that question the other day and I told her to put it in the Question Box and I suppose that is the way it happened to be here. As a matter of fact, I possess a beauty doctor and there is no posing about it either to tell the truth. That is my profession. I am a beauty doctor. Now if you want to be really beautiful your beauty must be more than skin deep. The trouble with most people is they are quite satisfied with the beauty that is superficial enough to deceive the superficial onlooker. That is all that is necessary. I was very much astonished sometime ago when I told a young lady she had a hump in her back and her chest was so collapsed that she was really awfully deformed. I cannot put myself into such a miserable position as she was in. When I came to examine her spine I found she actually had corns on her back. When I told her she had corns I thought it would make her straighten up. I thought, of course, when she found she had corns on her back by rubbing her backbone against the chair in which she sat if she found out what the cause of it was she would sit up straight and make a reform in her appearance. It did not disturb her a bit. She said, "Nobody will see them" so as long as it didn't show it didn't make any difference to her. I was called once to look over ^{the} a young ladies in a college, about 75 of them. They had put a gymnasium for the girls and the girls would not visit it. There were only two girls in the whole school willing to go to the gymnasium. They had heard there was going

to be a gymnasium put up and they would be required to take exercises and every single one came back to school after the summer vacation and with an excuse from their doctors, parents or some other authority demanding that they should be excused from the gymnasium exercises. The college authorities asked me to come up there to see what I could do in persuading those girls to take exercise. I said, "We will begin by making an inventory of these girls" so we had them come in and had their spines examined and you know I found that those girls nearly all had curvature of the spine. Only 3 out of the 75 that I examined did not have some curvature of the spine. The left shoulder was down or the right shoulder was down or there was a posterior curvature or an anterior curvature. There was something wrong with the spine. Some of them had twisted spines. I talked with them very earnestly about it both collectively and individually and I thought I had made a very great impression but the gymnasium teacher wrote me that there was no change. The girls still refused to go to the gymnasium and I was also invited to look the boys over to see if any of them were too feeble to take part in the college games so I examined the boys, something more than 100 of them. While I was examining them I fortunately found but 3 boys in the whole 125 who had curvature of the spine, just three boys. The most of the boys were from the farm accustomed to work so they had good development. While I was looking the boys over and talking to them a little bit about the advantages of health and of good figures and sound bodies a new idea occurred to me how to get those girls interested in gymnastics so I let it right out. I told the boys that I was so proud to find that only three of them had curvature of the spine. Then I dilated upon what an awful thing it was to have a curvature of the spine, to have a crook in the back or to be crooked in any way or in any shape. The boys seemed to be very much interested. Finally, after I got the boys to fully appreciating what it meant to be crooked and to have a crooked back, I said to these boys, "Now when you get a little older and get your education and get ready to settle down

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in life, when you begin to look about to select your wife, look out for the girl that has got a crook in her back"and then I added that I had just examined every one of the 75 girls in the school and there were only three girls in the whole class that did not have a crooked back. Then I got out of town just as quick as I could and I heard from the gymnasium teacher that every girl in that college made for the gymnasium the next morning so you see people are really interested in beauty and it is to be beautiful that we want to be well really because beauty means vigor and efficiency. It means something more than attractiveness. I think it was Aristotle who said that beauty of figure is far more to be admired than mere beauty of face, that ^{grace and} beauty of form are far more to be desired than mere beauty of face so to be really beautiful one must be beautiful throughout; not only have a beautiful face but must have beautiful hands as well and not simply have a good complexion for the face but must have a good complexion all over. I was very much shocked when I found a young lady's back all covered over with pimples and I told her what it signified and what it meant and she didn't seem to mind it very much. She said "if it was on my face, I should feel awfully bad about it but as long as it is out of sight I don't mind it". Now it meant the same thing. It meant uncleanness inside. It meant that the whole body was in a state of uncleanness and low resistance because of this uncleanness. The only way to be really beautiful is to live beautifully, to live rightly. There is a physiologic way and an unphysiologic way. It is physiologic to be beautiful but in order to be really beautiful one must live physiologically and that is the whole secret of life is to live physiologically. That means to live naturally and to live properly. If one is going to be beautiful, for example, one must eat beautiful things because our bodies are made of what we eat. If one eats corpses how could he expect to be beautiful, for example, but now then if one eats the beautiful fruit that are hung from the trees inviting us to eat reach up and participate in their delight, if one eats the delicious nuts, as sweet as a nut, you know, is an old saying, if one eats these natural foods that Nature has pre-

pared for us, that are all pure and sweet and good and clean, then he may have natural, clean blood and the result of good clean blood will be a clear skin and a good complexion. A lady asked me a good many years ago what was good for her complexion and I told her oatmeal. She said, "Do you mean to rub it on?" "Yes", I said, "Rub it on and rub it in and swallow it." It was oatmeal outside and inside. That is one of the best prescriptions for a good complexion I know of but to be really beautiful one must cultivate beauty in a physiologic way. It is not simply to spread something on to cover up some defect but it is to cultivate a thoroughly healthy sound body and beauty will be the natural result. One does not admire brown circles around the eyes and these brown patches on the hands and the leather colored skin. One knows what that means. Behind that leather colored skin is a bad breath. Behind that bad breath is impure blood, blood charged with those same offensive aromas that are coming out of the blood. The blood is charged with them. That is where they come from. They come from the body into the lungs and then they get into the breath and the blood has to take on itself the putrid effuvia and dispose of them somewhere. It finds them in the colon and so as the blood comes around to the colon these horrible putrescent odors are absorbed, carried to the lungs, poured out into the breath, and not only poured out into the breath but polluting the whole body. The breath is bad because the whole body is bad. It is not simply the breath that smells bad but the whole body smells bad and the whole perspiration has this offensive, you see, for the same reason, loaded with foul, putrescent materials that ought to be carried out through the bowels but are escaping through the lungs and the kidneys and the skin instead so after filtering through the whole body it is natural that the whole body should be polluted. That is really one of the greatest of all causes of looking bad in the American people is this chronic auto-intoxication that is the natural result of stagnation in the colon.

Q. Please give the probable reason for auto-intoxication in a strict vegetarian.

A. Well now, vegetarianism is not a panacea for all human ills. One could be a vegetarian and very unwholesomely and live very unwholesomely in many ways. The real cause of auto-intoxication in any case whether a person is a vegetarian or a non-vegetarian is constipation or stagnation. It is such a long delay of food residues in the intestine that there is opportunity for putrefaction and the absorption of these putrefaction poisons into the blood. That is the cause whether any vegetarian or a non-vegetarian. The idea is perhaps in the question of mind that a vegetarian not being a meat eater could not possibly get into a state of auto-intoxication but he may. Vegetable food consists of protein, starches and fats. Now the starches generally are all absorbed, practically, and the fats are nearly all absorbed but there always remains behind a part of the protein and in the case of vegetable foods the amount of protein which remains behind may be even larger than any in the case of animal foods, provided one in eating animal food eats sparingly. For instance, one in eating beans or other food rich in protein may have a larger residue of protein escaping from the body than a person eating meat in moderation so a vegetarian may have a large amount of protein left behind in the colon to undergo putrefaction and if there is an inactive state of the bowels, putrefaction will occur, not so easily as in the case of a meat eater but still it will occur. Then I should say also that the bile undergoes putrefaction and the mucus produced in the intestine undergoes putrefaction and the pancreatic juice and the remains of other digestive fluids all undergo putrefaction in the intestine so a vegetarian may be exposed to this cause of auto-intoxication as well as the non-vegetarian.

Q. Does graham or whole wheat bread ferment in the intestine?

A. Yes it may. The starch may undergo fermentation and the cellulose may undergo fermentation and there may be gas formation from this source.

Q. Please state the unmistakable symptoms of gastric hyperacidity.

A. There is only one and that is hyperacidity. Hyperacidity means simply to make acid. A lady asked a doctor once, "Doctor, what is the reliable symptom of tapeworm?" And the doctor's reply was worms so with hyperacidity the only real proof is an excessively acid gastric juice. The real proof is to be found in giving the patient a test meal and taking this up with a tube and then examining the fluid chemically and finding that it contains more hydrochloric acid than it ought to contain. The simple fact that ones stomach seems sour, that foul liquid comes up from the stomach into the mouth is no proof of hyperacidity at all because the gastric juice is naturally very acid. The stomach makes, in fact, nearly half an ounce of hydrochloric acid in twenty-four hours.

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Think of it, nearly half an ounce of the commercial muriatic acid as you buy it at the store. The very same sort of acid that they use in making soldering fluid for example, that will dissolve zinc and other things put into it. The stomach makes half an ounce of the concentrated HCl, such as you buy at the store. Now, of course, it isn't in such concentrated form, but if you should collect it all and concentrate you would have the equivalent of half an ounce of CC HCl. So there is always acid in a healthy stomach during the digestion of a meal and if anything rises from the stomach, it will be acid and be ~~XXXXXXXXXXXX~~ intensely acid, so intensely acid that it would digest the throat if it remained there a little while. Any live thing dropped into it would be killed. It would not be safe for people to swallow oysters on a half shell as you sometimes do, or eat oysters and other live things that people sometimes eat. They would make a good deal of trouble if it were not for this acid gastric juice.

Q--What is the cause of enlargement of the spleen?

A--The most common cause is the influence of poisons in the blood. Colon poisons probably are the most common cause. The poisons from malarial infection may be a cause and there are other specific causes, but the most common cause is the poisons developed in the colon and absorbed.

Q--Can a tumor or blood clot upon the brain or a blow upon the skull produce mental disturbance?

A--Yes, there is no doubt about it. All of the causes mentioned may produce mental disturbance.

Q--What is hemoglobin?

A--It is the coloring matter of the blood; it is the hemoglobin that carries the oxygen of the blood, at least, the chief part of it and carries the oxygen from the lungs and carries ~~xx~~ back, at least a part of the carbon dioxide, although not the greater part.

Q--What will increase hemoglobin?

A--Good food is the thing to increase hemoglobin. The idea formerly prevailed that iron was a great thing to ~~xxxxxx~~ increase hemoglobin and it is possible the

iron has a little influence that way, but not a of influence. So it was once the custom to feed people iron ~~xxxxxxxxxxxx~~ filings and all kinds of iron preparations, iron medicines and people traveled long distances to drink and do now, to drink the water from so-called "iron springs". There is little or no good from this use of iron. In fact, there is a good deal of harm because the mineral iron taken in in this way, is captured by the liver and held in it. It is possible that a little of it may be used but the real trouble is not that there is too little iron in the food, that is not the cause of a lack of iron in the blood. The reason is that there is a disturbance in the metabolism of the body so that the iron of the food is not utilized properly. That is the real cause and that is the thing to be remedied. It is not necessary to give the patient more iron but it is to get him to make use of the iron in his food, to make a proper assimilation of it, and there are many things that do that---The outdoor life and the sunshine have a marvelous effect in increasing the hemoglobin. You know what happens to flowers if they grow in the shade. If a potato sprouts in the cellar and you bring it out, it is perfectly white; if you expose it to the sun's rays in a few days, the white sprouts become green. The sunlight is necessary for the development of chlorophyl. Now hemoglobin is to the blood and the body what chlorophyl is to the plant or what red coloring matter is to animals and what the green coloring matter is to plants, and this growth is facilitated in the body by sunlight just as the growth of the green chlorophyl in the plant is facilitated by the sunlight. Miners who work deep in the underground passages of the earth become pale. Such a miner has no color. Flowers grown down in these dark places have very little color. The leaves are pale and in exactly the same way that plants are influenced, human beings and animals except those that by nature are adapted to this life in the dark, are also affected. So the sun bath and the outdoor life is one of the best means in the world for making hemoglobin. When one goes out into the sun, the skin gets tanned a brown color and this influence of sunlight is not simply upon the surface of the skin, the coloring matter is formed and developed deeper in. The sun's rays strike down in and

perhaps penetrate for an inch or two into the soft tissues, so the influence of the sun is felt on the interior of the body as well as on the outside. Another thing that is very beneficial is exercise. It is highly beneficial for exercise encourages the movement of blood through the body. Blood is produced in the bones. The marrow of the bones is the place where the blood is formed. The circulation of the blood through the bones can be increased only through the use of the muscles. A single blood vessel brings down the blood for ~~xxxxxxx~~ bathing the muscle underlying the bone. If the muscle is active, the amount of blood circulating through it may be five or even ten times as great as that circulating through the muscle when it is idle, and consequently the amount of blood circulating through the bone will be proportionately increased because of the larger amount of blood that is brought to the ~~xxx~~^{limb} as a whole. So you see exercise is one of the most important of blood making agencies. It is very highly important. Another thing that is of very great importance also, is a fact discovered by Dr. Hurter of New York who is an eminent bacteriologist and a chemist also, and he made the very interesting discovery that people who have too little blood, the chief trouble is not in the majority of cases that they do not make blood enough and that they do not have iron enough, but the chief trouble is that the blood is destroyed too rapidly. Now the blood is all destroyed about once in six weeks. You remember that Lord Bacon, the philosopher who some people think wrote Shakespear, I don't know whether he did or not. I haven't gone into that controversy, but Lord Bacon believed that everybody ~~is~~ needs to have their blood changed once a year. He had the idea that the blood got old and needed to be changed, so he recommended that everybody should be bled once a year and it was quite the custom in his day and still in going through some of the old parts of London, you will see a sign out, "Hair cutting, leaching and bleeding done here." The barbers were at one time the surgeons and all the surgery was performed by barbers. Some of the most eminent surgeons of the middle ages were barbers as well as surgeons. I suppose because they had a sharp ~~raison~~ with which to do cutting, so they were the chief persons to do the surgery. Lord Bacon had the idea that ~~xxxxxx~~ the blood must be changed once a year, but nature changes the blood

every six weeks. Nature does not ~~maximize~~ wait for springtime to come before she changes the blood. That would never do. A blood corpuscle gets its development, grows old and dies and is disposed of. The dead body is disposed of in the liver and the spleen which are sort of cemeteries for dead blood cells. These dead particles are disposed of once in six weeks, ~~but~~ and go through the whole cycle about once in six weeks. Now when a person is suffering from anemia, it is because the blood corpuscles do not last the whole six weeks. The corpuscles are disposed of more rapidly than they ought to be; they are destroyed too fast, and one cause of this rapid destruction was found by Dr. Hurter to be poisons produced in the colon. It was a very simple experiment that proved this. Dr. Hurter observed in studying a large number of cases of pernicious anemia, some twenty-two cases in all that there was a large amount of a certain germ present. One germ was always present in great numbers in every case so he cultivated this germ, made a culture in some beef tea or bouillon, simply a limpid solution in which no germs were growing. The germs were put into it, so small that he could not see them. He could see a little turbidity of the solution. He put some blood into the solution and ~~it~~ at once within a very short time, the blood was all dissolved. The blood cells were destroyed so that when he took a drop of the liquid and examined it, there were no blood cells there but they were all dissolved. Certain mechanical poisons are produced by these particular germs of which Welch's bacillus is one. They produce a poison which dissolves the blood cells, so you see there are several things to be thought of beside of giving iron when a person is suffering from anemia.

Q--Is there ~~any~~ not something wrong with one's gall duct when the bile comes into the mouth?

A--Well I think we can hardly say there is something with the gall duct. There may be something wrong but you notice the relation of the gall duct to the stomach. Here is the stomach and here is the pylorus. Just a few inches below. The ~~any~~ pylorus, the gall duct comes in. The natural course of bile is down. Sometimes the pylorus remains open so that the bile may find its way back into the stomach. This is particularly true when the material is not moving along the small intestine as rapidly

as it ought to. If there is incompetency of the ileocecal valve for example, and ~~the~~^a backing up into the small intestine so the material is delayed in the small intestine, that naturally has a tendency to cause a backing up of bile into the stomach. Then there is likely to be vomiting, but it is probable that the bile passes out and in the stomach more or less, especially in people who have achylia, that is, people whose stomachs do not make any HCl at all. In such cases, the bile probably enters the stomach quite frequently. It is not to be considered as a thing that is dangerous, that is seriously harmful in the majority of cases, although when the bile enters the stomach too freely or in large quantities during digestion, there may be considerable disturbance. I remember a good many patients frequently remark to me in the office, "Doctor, if I could only get this bile off my stomach, I know I would be all right." And they want an emetic or something so they would vomit a lot of bile. People often imagine that they have had this bile in the stomach for weeks or months or years even, and if they could only get it off, then they would be all right. Now as a matter of fact, it is impossible for the bile to remain in the stomach during the digestive process because everything is moved out of the stomach. If you have eaten a meal and it is passed along all right, you may be sure the bile has got off your stomach. ~~That~~ It does not mean there is anything wrong with the liver when there is bile in the stomach or that a person is bilious so far as the liver is concerned at any rate. It may be there is nausea resulting from putrefaction in the intestine which is the probable cause of the biliousness, and in this case, there might be a backing up of bile in the stomach, but this is no fault of the liver or the bile duct.

Q--Kindly give a rule for water drinking in case of inactivity of the bowels?

A--Drink a glass of water at night when you go to bed, another when you arise in the morning, a couple of quarts during the day, beginning a couple of hours after eating and drink a glassful every hour. It won't do any harm if you take a small quantity at a time. Don't undertake to drink twenty glasses one after the other. I remember a german one time was reported to have drank twenty glasses of water be-

fore breakfast. That is going to a great extreme. You might say he was almost in danger of drowning. At any rate drowning out his stomach, but the proper way is to distribute the water through the day, particularly a little ways a way from meals, because drinking too much water at meals overloads the stomach, and in addition to that, it ~~dilutes~~ dilutes the gastric fluid but it overloads the stomach.

Q--Please explain how one and the same exercise will reduce a stout person and develop muscle in a thin person?

A--That is a very easy explanation. A person who is stout is not stout because he is too strong, because he is too big. The word stout seems to be used in a double meaning. We say sometimes a person is stout or strong when he can lift a great deal, when he is very well developed. That perhaps is not a correct use of the word. We say a person who is very fat is very stout, but from an entirely different cause. A person who is too fat does not have too much muscle but he had too much waste tissue. For instance, a year or two ago, I was talking with a lady who weighed something like 260 pounds. I asked her how much she weighed when she was twenty and she said she weighed 130. She had just doubled her weight. She had to carry around another lady of her own size on her shoulders, you see, simply dead weight. No wonder she got tired, got out of breath and was going to pieces. Any of us would if we had to carry around all day long a person of the same size as ourselves. That is what a person who is obese is doing, you see. Now what this person wants, is to get rid of that surplus of flesh. Why the situation is just the same as would exist in relation to a railroad train, going down the track, stopping at every station and at each station taking on twice as much coal as it had burned since it left the last station. What would happen. Pretty soon the tender would be running over and the coal would get over into the smoking car or the baggage car and the coal by and by would fill up the smoking car, get over into the day coaches and by and by get into the sleeping cars and the whole thing would be filled with coal. That is the situation with the overfat man. He has been taking on too much coal at the stations you see. He ate more than he disposed of since eating the last meal, you see, so he has accumulated food material

that has not been used. Now then what we want to do is to reverse that process. What would the train do to get rid of that surplus coal? It would stop taking on coal at the stations or at least would take on less than it burns since it left the last station and in time all that surplus coal would be disposed of. Now that is exactly the way for a person to get rid of surplus fat. He cannot get rid of it in any other way. That is safe. Certain remedies and medicines are advertised and sold of various sorts, but the way medicines make people thin is by making them sick. I have heard of scores getting thin by drinking vinegar and spoiling their digestions, then of course, they would get sick and get thin. Such cases are lamentable. The United States Government has recently been calling attention to the danger in some of these anti-fat remedies. I am sorry to say some of them profess to emanate from Battle Creek, although as a matter of fact they are manufactured by Park, Davis & Company and sold to these patent medicine fellows who distribute them all about the country. I think the people ought to know the facts about it. I know that because one of these fakers, a man of some notoriety has lived in Battle Creek and because unfortunately for me, his name was Kellogg, although no relative of mine and a great many people have been writing to me, blaming me because my anti-fat remedies made them sick. I have a stack of letters four feet ~~high~~ high, I simply have thousands of letters that have been sent to me from all over the United States and the world in fact, some of them wanting some of my medicine, some of them telling me I had got to pay their money back quick. One day a man appeared in my office and said, "Are you Dr. Kellogg?" I said, "Yes." He said, "I want \$25.00 if you please sir." I said, "Do I owe you \$25.00?" "Yes sir, yes sir, you told ~~me~~ my wife that you would reduce her flesh and she sent you first \$5.00, then you told her it would take \$25.00 and she sent you \$20.00 more and she is fatter now than she ever was before and I want my money right away quick. I live up here in Petoskey and I have come all the way down here to get that twenty-five dollars. I have written you a good many letters and you have paid no attention to them." I said to him, "You are mistaken. I have never had any correspondence with you." "But you are Dr. Kellogg, you can't get out of this thing. I

am going to have that money or I will thrash you." "Now," I said, "just wait a minute before you do that. Haven't you got the circular or letter head of something." "Yes." "Now just get it out." So he got it out and there was a picture on it. The picture on the letter head looked out at me and it was a very different picture from my own, so the man concluded possibly he might have been mistaken. "But where is he?" he said. "Just tell me where he is. I will catch him if I have to follow him to the end of the earth. I am going to have that money back." I have had a number of experiences similar to that and some of them really very funny. A big fat Dutchman brought his daughter here and she was three feet thick at least, an enormous girl of sixteen. He brought her down to show me how the medicine had not done her any good. They came from Milwaukee and he said he thought perhaps if he brought her to headquarters, we might be able to do better for her. Now I became so much annoyed about this thing, especially when this fake is advertised all over the state of Texas and used my initials as well as my name instead of his own, then I began to think it was time something should be done and so I appealed to the postoffice authorities to look into the matter to see if there was not some way I could be protected to some degree and they sent one of their inspectors to look into this thing to see just where this medicine came from, and they traced it to Park, Davis and Company in Detroit, and these fakers are really simply the selling agents for Park, Davis and Company, so these men who are manufacturing medicines for the doctors are at the same time making medicines for the quack doctors and for charlatans of all sorts. I don't think it does any harm to let the truth be known occasionally.

Q--How can one know the extent of colitis?

A--That is one of the great advantages of the X-ray examination. After a bismuth meal with a thorough-going examination by an expert, it is possible to tell just where the colitis is, how much there is of it, how much of the bowel is involved in it. I sent a gentleman in this morning for an X-ray examination. He has colitis and he asked me how long it would take to cure him and I said "it depends upon how long your colitis is." So I sent him to the X-ray Department to find out. It may

be a foot long or it may be seven or eight feet long. The extent of it, of course, will make a difference in the length of time required to cure it. It is a very very excellent thing to know just whwere it is. It is generally in the last half of the colon. ^{Generally} ~~xxx~~ this part of the colon is involved, but very frequently the alimentary canal and the pelvic colon ~~xxxx~~ are the most frequently involved. Then the descending colon comes next and it then gradually works back to the cecum. Then the appendix is likely to become involved. Disease of the appendix I think nearly always begins in the colon.

Q--A lady about to take an ocean voyage wants to know if there is any way to prevent seasickness and what is the physiologic explanation of seasickness?

A--The physiologic explanation is, that there is a disturbance in the centers of ~~xxxx~~ equilibrium. There are certain centers in the internal ear that enable us to keep ourselves in equilibrium and when the ship is rolling ^{all} about in every direction, these centers get tired, get upset or something and it has a very disturbing influence. There are several things one can do to control this to a very great degree. In the first place, it is very important to be in good condition when you go on shipboard. The bowels must be in good condition. If they are in the habit of moving three or four times a day, it will make a wonderful difference. If the alimentary canal is clear, it is a pretty good beginning. One could have a rest for a day or two before he goes on shipboard so as to get the nervous system in good condition. Then if you are really very subject to seasickness, it is a good thing to go to your birth if the weather is fough and lie down. If you have a well ventilated birth and keep your eyes shut while the sea is at all rough and you feel the least bit inclined to seasickness, shut your eyes and keep ~~xxxx~~ them closed. Have an ice bag at the back of your neck and keep quiet and keep still. You will be surprised to see how much comfort and relief will be obtained in this way. Persons who are quite subject to seasickness ordinarily find almost entire relief. You should have two ice bags, one for each side of the back of the neck so you can lie just between them. When it comes dinner time, don't go to the

dining room and eat a great hearty meal of those rich things furnished on ship board like plum pudding and such fare and the rich pies and cake and steak and things of that sort but make a diet of light, simple, ~~many~~ easily digestible things, like cereals and simple vegetables, green vegetables and fruits. I asked my steward once in going across in one of the big liners when everybody was ^{very} sick pretty nearly, I asked him what he thought was the cause of seasickness. "Oh," he said, "its the big dinners." There is no question about it. These people go in there and eat just stuff themselves, then they go out and vomit, then come back and eat again. So he said it was perfectly ridiculous. Why, I used to be seasick until I learned better than to do that ~~and~~ and I don't have any seasickness any more. He said, "The captain is seasick now. And," he said, "he is a good feeder." So there is nothing to make one ~~proof~~ proof against seasickness if he does not exercise some reasonable care in relation to it.

Q--Will paraffin oil be more effective taken in hot water than in cold?

A--Some people find it agrees better with the stomach when it is taken hot and I think it passes out of the stomach more quickly. We do not want to have ~~paraffin~~ ~~fin~~ oil remain in the stomach any length of time but the sooner it gets out the better. It is well to take it half an hour before meals because then it has time to get out of the stomach, and if taken hot it perhaps leaves the stomach a little more quickly than if taken cold.

Q--What is the function of the appendix?

A--The appendix is a big mucous gland and its duty is to form a lubricating mucous which is poured out upon the intestinal contents at the beginning of the colon.

Q--Explain the cause of mental breakdown. Is it caused by over study? What remedy can be used? If caused by ^{a blow} ~~xxxxxxx~~ what is the remedy?

A--If it is a blow that has depressed the skull, the skull must be raised. If there there is no particular injury to the brain, it may be relieved. Wonderful relief has been obtained by operations of this sort sometimes, but I doubt if anybody ~~ever~~ gets mental upset from over study. People may get mentally upset perhaps from lack of sleep. Perhaps if a person deprives himself of sleep and occupied

with study when he ought to be asleep, that would have a detrimental effect upon him, but I don't believe mental work or physical work does anybody any harm. I think that is a great mistake. I meet a great many people who think they have been hurt by overwork and I inquire what they have been doing and they don't seem to have had enough to do to keep them really healthfully occupied. The people who break down from overwork generally have disturbed nutrition from some other source. Auto-intoxication is the real thing. Too much hard work puffing at a cigar sometimes; too much arduous work at the dinner table and too much beer; too much tea and coffee and other unwholesome things. They are the real cause of mental breakdowns rather than wholesome mental work. Harassing, worry may break a person down mentally.

Q--Is it advisable to eat when not hungry?

A--That depends. One never should ~~think~~ do that unless his doctor tells him to. In general it is a good rule to follow to eat only when you are hungry. Work until you are hungry. If you do not feel hungry at dinner time, don't eat because it is dinner time. The majority of people think they must eat ~~at~~ ^{at} ~~at~~ dinner time but that is a great mistake. The proper time to eat is when you are hungry. If you eat twice as much breakfast as you ordinarily do, you ought not to eat dinner so soon. The amount of time necessary to digest the meals depends very much upon the size of the meal. A very small meal may be gotten out of the stomach within an hour, whereas a large meal might remain in your stomach ~~for~~ some seven or eight hours. and the quality of the food also makes a difference. If one eats a great deal of fat, it would stay in the stomach a much longer time than food that contains little fat because fat is one of the slowest things to get out of the stomach. If one does not chew the food properly, the unchewed food is likely to remain in the stomach for a long time. That delays greatly the emptying of the stomach, so one must give some ~~thought~~ thought to his condition every time before sitting down to a meal. Never eat because it is time to eat; never eat because somebody offers you something that looks good; never eat unless you are hungry. Why it is just as foolish or silly

~~XXXXXXXXXX~~ for one to eat when he is not hungry as it is for one to drink when he is not thirsty. That is perfectly absurd. Hunger is a bodily instinct which calls for food and if any one does not have any call for food, why should he eat. I am afraid a good many people eat to have a good time. They eat to have fun with their palates, if you please, to just play music on the gustatory nerves and that is not right; that is abusing a very important ~~king~~ sense which is given us to regulate our nutrition and to tell us when to eat and when not to eat. We do not listen to it when it says not to eat. We crowd ourselves. Some people are very much afraid they are going to starve to death over night if they don't eat a hearty supper. These six o'clock dinners, by the way, are a terrible curse to the country. Thousands of people become invalids and become sleepless and afflicted with insomnia and break down in health many times because they cannot sleep, simply as a result of these heavy six o'clock dinners. The last meal should be very light because one can digest well when he is asleep, but he cannot sleep well while he is digesting and the stomach works very slowly. I remember an old gentleman who seemed to have this idea very strong in his mind that it was very necessary to have something to eat. He came home late one night, about 10 o'clock and he called to his wife who was sleeping up stairs. First he hunted around in the pantry to find something and didn't find any pie or anything he wanted, so he shouted out at the foot of the stairs, "Mary, Mary, where is the pie?" Mary said, "Oh John, I am really sorry but there isn't any pie in the house tonight." So he went back and made another search then he came back and shouted again, "Mary, where is the cake?" And his wife shouted back a very profuse apology, she was very very sorry indeed, but there was no cake in the house. He shouted right back at her, "Mary, what would you do if somebody should be sick in the night." Well this idea that we must eat and eat and eat, that we are likely to die in a short time if we do not eat is a very erroneous one. I knew one man who lived over here in Kalamazoo. He actually made his wife get up twelve o'clock every night and cook him a hot dinner, at midnight every night, but he died early. I thank you for your attention.

End.

Health Training.

A Stereopticon Lecture at the Sanitarium

Parlor, Battle Creek, Michigan, Thursday, October 15,

1914 at 8 p. m.

by

J. H. Kellogg, M. D.

I have just been over to the Annex talking to some Presbyterian preachers. I told them a story a Methodist clergyman told me. The circumstances happened to a friend of his. A friend of his was talking to some boys in school and he wanted to impress those boys with the importance of Methodist preachers to the world, and he chose for his text:

"Ye are the salt of the earth."

And he wanted the boys to understand that Methodist preachers were especially referred to in that text. So he began with talking about salt. What is salt? And they all knew what salt was. "Now what is salt for" he said to the ~~many~~ boys." And they all said together, "To keep good victuals from spoiling." It went on for sometime and he explained that Methodist preachers were doing so much for the world to keep the world from spoiling and make it better. "Now boys, will you all tell me together what our Methodist preacher is for." And they all shouted out at once, "To keep good victuals from spoiling." I tried to convince these people that it was their duty to take hold to help the campaign for race betterment; that if anybody is going to keep the world from spoiling, it is the duty of the preachers to do their part, for that really is their proper job. Doctors, I suppose to make their living by helping people who are already sick, and the sicker the people are, the better for the doctors, of course, the more business. So it naturally would not be expected that doctors would be the only ones who would be especially interested in helping to prevent sickness.

Now I am going to talk to you tonight on a continuation of what I was saying a week ago tonight, about how the body resists disease. Now I propose to

talk about health training. When you talk about health culture, the idea which is generally received, is that health culture means some sort of gymnastics, living out of doors, going fishing or hunting or doing something to cultivate ~~the~~ and develop the ~~mass~~ body and that is all right. I do not mean to say that hunting and fishing are all right. I don't believe in that, but the outdoor life and the general culture and development of the body, that is a part of health culture but it is not the whole thing. The foundation rule of this institution, the main thing we undertake to do for people here is through health culture, health training. The doctors found out long ago and the people found out much longer ago that medicines do not cure. I remember a story of a Irishman who called upon a doctor and the doctor gave him something and said to him, "Take this home and take one of these pills three times a day." And he took the medicine home and his wife persuaded him not to take it, but to give it to the dog and he gave it to the dog and the dog promptly died. He met the doctor on the street a few weeks later and the doctor asked him, "Well How are you getting along?" "Well," he said, "I am fine sir, but the dog is dead." And some of you perhaps remember of a cholera outbreak in Staines some years ago when people were dying very fast in the community, and they finally made up their mind that the doctors had poisoned the wells in order to make business for themselves. It was a most outrageous suggestion, for doctors never do things of that sort at least, so the people ^{each one} ~~many~~ had received different medicine. The doctor in his desperation had been giving everybody something new for they were all dying so he gave everybody a new kind of medicine. He tried a new thing for each new patient and these patients or their friends, their survivors came together in a great group to this doctor's house and they made him swallow something out of every bottle and the doctor promptly died, at least so the newspaper said. Now I don't mean to say that doctors purposely, maliciously poison people, far from it. There is no profession in the world that gives so much gratuitous effort to the world as doctors do. If a doctor hears of a ~~man~~ sick baby ten miles off and he knows he will never get a dollar. He will get up in the middle of the night when he is half dead for want of sleep, harness his horse, get out

his carriage and ride through the stormiest, coldest winter night to help save that baby's life. Thousands of doctors are doing that sort of thing all the time, so there is no class of men in the world that give more time freely and generously than the doctors do. But the world and the doctors are perhaps chiefly to blame for it. The idea that drugs cure! Now it is not the fault of the doctors, it is not the fault of the profession that this idea has prevailed, because it is an idea that was handed down to us from ancient time and it is one of the old sanctions that it is our duty to get rid of the worst slavery in the whole world, and the worst slavery that ever was, my friends, is the slavery of men to preconceive pre-established opinion, to well establish opinions. We must not differ from them. The doctors have had this idea perhaps more strongly than almost anybody else, no not quite as bad as the lawyers, the lawyers have it so terribly bad, I don't think they will ever get over it.

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If you ask a lawyer his opinion on any legal question he won't give it to you straight away. He has somebody go and look up and see what somebody thought about it, to see the established opinion about that thing. Then he will report to you in a brief and charge you twenty-five or fifty-~~one~~ hundred dollars so with clergymen; in recent years clergymen have been breaking away from the old ideas and the old theological notions are going to the wall very fast, too fast I am afraid; so with doctors. Doctors have been getting light and light first came up from the laity. The people who were the victims, we may say, in a certain way of the doctors' mistakes and of the errors of the medical profession, have seen light first of all. The great reforms that have been made in medicine until very recent times have come from the laity. It was the laity, the common people, that first discovered that water was a valuable remedy so it was one of Nature's most important and most potent remedies. It has taken more than 100 years for doctors to begin to appreciate water and they do not appreciate it yet. The scientific use of water began more than 100 years ago with Dr. Currie in Liverpool and he wrote an admirable treatise upon the use of water. He was the first man who ever used a thermometer in the treatment of fever. John Hunter invented the medical thermometer and Dr. Currie of Liverpool was the first to use the medical thermometer in the treatment of fevers. It is very curious how water was first introduced in the treatment of fevers. A Dr. Jackson was a doctor in Jamaica for a while and while ^{there} he saw a great many people who had yellow fever. Yellow fever was rife there as it has been during ^{all} ~~the~~ the hundreds of years since but it is going to be blotted out after while. Thanks to the discoveries of recent times in relation to the cause of yellow fever. He noticed that when a native took sick with yellow fever his friends took him to the seacoast and took him on the sand and poured water over him. When he came back to England he came down with yellow fever himself and on shipboard, contracted the disease just before he left and he made the sailors draw buckets

of water with ropes from the sea and pour it over him as he lay upon the bed and he recovered so when he got to Liverpool he told the story of his recovery and of the treatment of fever by these untutored natives of Jamaica and Dr. Currie became very much interested in it. Scarlet fever was at that time very prevalent in Liverpool and Dr. Currie's own children came down with scarlet fever. He had no faith in the drugs that had been recommended and used for centuries for this disease. He had no faith. He knew they did no good so he treated his children with water. That was the first time I know of that civilized people had the advantage which the savages had been enjoying some time immemorial of having the natural treatment of fever with the natural remedy, water. His children recovered and made such splendid recovery and the observations which he made of the influence of the water when poured over their bodies upon the temperature were so very surprising and interesting and so wonderfully rational that he gave it out to the profession and he treated many cases of fever in that way and Dr. Rush of Philadelphia, one of America's greatest and most noted physicians, one of the signers of the Declaration of Independence, Dr. Rush made a trial of the same remedy in the treatment of yellow fever and with most excellent results and he used water in various other ways and a sort of water cure revival was started in the United States and physicians in different parts of the United States began the use of water and little water cures started up all about the country but they soon disappeared, not entirely, however. A few lingered on and this institution which was started almost fifty years ago was one of the later results of that idea created by the observations of Dr. Currie and Dr. Jackson. Something was due also to the work of Priesnitz, the Austrian peasant in Austrian Silesia, an ignorant man absolutely untutored who could not read or write living out there in the mountains far away from the center of civilization, he a sagacious observer noticed that water was useful in the treatment of animals. In fact, it seems the thing began in quite a romantic way. When he was a boy about ten years old one of the

travelling locksmiths came along. There was not enough business anywhere in any one center to keep a blacksmith or locksmith busy and as locks and hinges were made by locksmiths in those days, they used to travel though the country. This man in travelling through the country stopped at his father's house and it happened just at that time that one of the cattle in the fields, a valuable cow, had backed up against a sickle and cut the cords of her leg just above the hoof and the animal was really so badly crippled they thought they would have to kill it. This man said, "I have a magic by which I can cure it" but he would not allow anybody ^{to} see him do it but he allowed the little boy, Vincennes, to go along with him to carry a couple of sticks and a basin of water and some cloths. His father said to the boy, now notice very carefully the words that he says because he is going to repeat some magic words so the boy went along and carried the water and the sticks, etc., and the cow was found in the pasture and the towels were wet in water and wrapped about the cow's foot and the sticks were crossed over the bandage and then the magic words were said. The little boy took careful note of these words and when he went back repeated them to his grandfather and so the magic working locksmith went on. The boy's duty was to change these cloths every day and very carefully cross the sticks over the bandage after it had been made. Twice a day the cloths had to be taken off, re-wet and applied to the foot and the cow actually got well so there was great faith in the magic and the boy had learned the words so that people began coming around from all about to have their pigs treated and their dogs and cattle and horses and the boy began treating the horses and the cattle and pigs and many of them got well. He treated them by means of cloths dipped in cold water and repeated his magic words.

He treated them by means of cloths dipped in cold water and repeated his magic words. By and by people said, "This must be good for us as well for the pigs, horses, and the cows. In fact, the boy himself got hurt. One day when he was out hauling logs down the mountain side the horses ran away and a great log rolled upon him and crushed in his side and the doctor said his case was hopeless, that he would always be a cripple but the boy had seen the good effects from water so he dipped the cloths in water and laid them upon his side, wrapped them around his arm. and His ribs had been pulled out of place and he got hold of a chair and pulled his ribs into place and herocially went to work to heal himself and in the course of a few weeks he was well again. Then people began to flock around from all about and pretty soon there was a row of people in front of his father's log cabin every day waiting to be treated. The boy treated them in various ways and by and by he found that a sponge was more convenient than a wet cloth so he had already gotten the name of the boy with the magic work and that is what brought the people in there. Then he began to use the wet sponge instead of the cloth. The story I am telling you seems almost too romantic to be true, I expect to you, but I am quoting as nearly as I can directly from the life of this man, Vincennes Priesenigs, which is now published and I have it in my library. I think the story is true. The facts were gathered together while he was still alive and I have visited the place where he did his work and found so much of it true that I think it must all be true. In using the sponge he would dip a sponge in the water, say the magic words over it, then apply the water to the injured part. If a man had gout, for instance, he would make him sit

down in a chair and with a sponge he would drip the cold water over his foot and rub the toe where the trouble was for hours and in eight or ten hours it was declared that the very worst cases of acute gout would be brought to a successful issue so the boy very soon got the name throughout the whole country of the boy with the magic sponge. The doctors began to be very much incensed because people they had pronounced incurable and ready die, some of them went up to this boy's cabin and came back well. There was a good deal of commotion so it was sent out that the boy had an evil spirit, that he was using bright magic to cure people and so he was arrested. He was then grown up to be a young man and he was arrested, taken down to a neighboring village and put in jail. I saw the very place where he was incarcerated and visited the village. He was kept there for some little time. Finally, he was let out on the promise that he would no more use the magic words but he was allowed to use the magic sponge still. People thought the magic was in the sponge and it was years and years before the real fact came to the surface that the real magic was in the water and it was only after thousands and thousands of people were flocking every year to this hospital humble place, sometimes as many as 1500 people at one time found their way to this little hamlet away up there in the mountains close to the border of Russia. People went from this country and from South America and from all over Europe and after while physicians began to travel to Graafenburg and various European Governments sent the surgeon-generals of their armies to learn about this simple method. The surgeon-general of France was sent over there and similar officers from various other countries. There was great opposition on the part of the medical profession. He was an ignorant peasant that was curing incurables and the people were flocking there from all over the world. Members of royal families went there, Lords and Ladies and people of high degree, and he was getting so famous that the opposition became very intense. Finally, the Austrian Parliament appointed a

committee to visit him and ascertain whether he was a charlatan or not and this committee brought back such a glowing account of this man's work and of his honesty, integrity and the reality of his cures that the Austrian Government issued him a special diploma permitting him to practice the art of using water so he had no further trouble with the doctors. Now that was really the way in which water became introduced into medical practice. Priessnitz did not discover it. Priessnitz simply, when he began to use water, after he got a little older, he found a great number of practices in common use among the people of that mountain region. He found that people who could not sleep had the habit of wetting their stockings and putting these wet stockings on and then putting dry woolen stockings over the ^{cotton} wet/stockings and going to bed and going to sleep. He found that was a common practice. He found people who had fevers were wrapped up in wet sheets. In fact, in that country when a hog is sick they wrap him up in a wet sheet or a sheep and give him a regular body pack. There are pictures I saw them at Graffenberg of hogs with moist bandages around them such as some of you wear every night and cattle were being treated with these moist bandages. It was a very common practice among the country people. They used the same methods for themselves. Their methods were very crude. One method of relieving sleeplessness was to wet the nightgown in water and then put it on and go to bed. It was found to be a very efficacious remedy but the water was used very extensively long before this time. John Wesley the founder of the Methodist Church was well acquainted with the use of water. He wrote a little book entitled, "Primitive Physic" and in this little work he recommends almost every one of the water cure measures we use here in this institution, at least representatives of all the various methods, the fomentations, the morning cold bath. I remember one of these prescriptions for a child that had the rickets. There isn't any better one except a proper diet. He said if the child has the rickets it should be dipped in the cold water in the morning immediately after awakening and should be new dipped every morning for a year. Then he said the

child would be found well. Now the cold morning bath is one of the finest things for a child that has rickets. There is no doubt about that. He recommended water drinking and a large number of other remedies you might imagine we devised ourselves. I have a book of his published more than 100 years ago. I think my book is the seventeenth edition of his work entitled, "Primitive Physic". Our reforms have come from the common people. We have come at last to recognize this thing that the body is the real curative agent, that the healing power is not in a bottle, that it is not in a pill or in a remedy or in a bath rub but it is in the patient himself. The healing power is within the patient which operates the cure and if a man is ever cured it is because he has got well in him. It is because he has *Vis medicatrix naturae* within his body that is capable of restoring him to health and if he has not got it he cannot get well. People say sometimes, "Why don't I get well faster" and I sometimes say, "You haven't *Vis medicatrix naturae* enough. You have spent your *Vis medicatrix naturae* in big dinners and suppers and in other ways so you haven't got it and you will have to go along slowly" and we have got to recognize that is the only way for a person to get well, is to adopt the method of the old prophet who said, "Cease to do evil and learn to do well." Change of habits is the most important thing a person who is chronically ill can possibly do because the man who is chronically ill is sick because he has cultivated ill health in the great majority of cases. Now acute sickness comes from the outside but chronic sickness is a home product. It is cultivated at the dinner table and the supper table. It is developed right in the home by unphysiologic habits. Now what we are seeking in this institution is to find the physiologic way, the biologic way and then walk in it. Sometime ago Professor Cattell the editor of the Popular Science Monthly, one of our leading scientific men, called here and we had dinner and he met me in the office immediately afterward and I thought he looked as though he was not very well satisfied with his dinner. At any rate he said, "Doctor Kellogg, I want you to tell me what your basis is. What is your basis?" "Why", I said, "What do you mean?" He said, "You don't have any meat here. You don't eat

meat. I see you had no meat of any kind on the bill of fare. I want to know why. What is the reason for this? " I said, "Our basis is physiology." " Physiology" he said. "Why do you exclude meat if physiology is your basis? Is not meat food?" "Yes", I said. "Meat is food for some animals but man and I personally and the rest of our folks here belong to the primates, to the great class of animals known as primates. Now you are a scientific man and you know that the primates are represented by man and the higher apes and I would like to know if you can mention to me any primate besides man that eats meat." Well he thought a little while. "Well, no. I don't know that I can", he said. "Well, do you know of any primate that ever lived or any primate represented in the fossil remains of the crust of the earth that ever ate meat that you know of?" "Well, I don't know that there is," he said. "Well, I am a primate and I don't see that I have any business to eat meat when no other primate ever ate meat. Meat is the diet of carnivorous animals like the lion, the cat and other animals that are adapted to a meat diet. I am a primate and my alimentary canal and my digestive apparatus are not adapted to a meat eating diet and I have no instinct to lead me in that direction." A young cat that has never seen a mouse when it sees it for the first time will lay hold of it and eat it but give a baby a mouse, for example, and see what it will do with it, especially a girl baby. See what will happen. Give any sort of animal to a man or woman that has never been taught to eat meat, that has never been inducted into the meat eating process by slow degrees and you will find there is no instinct leading to the catching of an animal and eating it. There is no natural instinct in the human body to slay and eat but it is perfectly natural to take an apple, a peach or plum or a cherry or any other kind of fruit and place it at once in the mouth and eat it.

It is perfectly natural for a baby to pick a cherry ~~if~~ of a tree if it is held up to the tree and is near enough to the cherry so it can. So we see there is no instinct in man to eat meat, it is unbiologic, unphysiologic and the whole purpose of this institution as I said, is to find the physiologic way of eating and of living in all particulars, then follow that. Now the principal work of this institution is to train people into correct habits so far as we know what they are. Now what is the advantage of training? I am going to illustrate that to you in a few moments by some pictures on the screen here, but first just a word about what is to be accomplished by training. You know when an architect builds a house he does not build that house so that it is just barely strong enough to hold together. That is the kind of houses they make sometime for exposition purposes, perhaps some houses like that at the exposition at Chicago I remember, and some of them fell down before the fair was over. These pasteboard houses are only for exposition purposes, but the house that is intended to be used ~~for~~ to last, has put into it a surplus of strength. There is a large margin of safety put into every beam, every pillar and every part of the house from rafter and every sleeper, every part of the house has put into it, a large margin of safety. Now that margin of safety is the thing that enables the house to last; that is what makes it possible for a house to indure. A pasteboard house looks just as well when it is first made as a house of oak or a house made in a substantial manner, but the house made of oak will last for centuries because it has a margin of safety which provides for the wakening influences of time. Now the human body is made on exactly the same plan. Take for instance, the lungs as an illustration. We have in the lungs a capacity of three hundred cubic inches. Now of this three hundred cubic inches, we use less than thirty in our ordinary breathing. We take in less than thirty cubic inches and breathe out less than thirty ~~in~~ cubic inches when we empty our lungs. When we have taken an ordinary breath, if we take a very deep breath in addition expand our lungs as fully as we can, we can take in 100 cubic inches more and if we breathe out an ordinary breath, we can breathe out one hundred cubic inches

more and there is left in the lungs still after we breathe out all we can, 100 cubic inches more, so we have nearly 300 cubic inches of air space in the lungs of which we only use about thirty under ordinary circumstances, but we may increase the lung movement by special effort so that we can breathe out 130 cubic inches more than that, 230 cubic inches we can breathe out and in in cases of emergency. That is, we can breathe out and in seven or eight times as much air as we ordinarily do breathe. Now what is the reason for that? Because we sometimes need more air. Oxygen is the element of the air that furnishes power to the body, just as oxygen is the thing that makes the power in the furnace. Fuel would be of no use without oxygen to burn it, but the oxygen combined with the fuel releases the heat stored up in the fuel, the sunshine that has been crystalized there centuries ago perhaps in the case of coal and the heat then makes the steam in the boiler and that makes the pressure and the pressure of the steam runs the engine that turns the generator and makes the electrical current that comes shining out again here, giving us the sunshine that has shown upon the earth perhaps one hundred thousand ago or more. Now that ~~xxxxxxxxxxxx~~ same sort of alchemy is going on in the body. Food is fuel and oxygen burns the fuel and releases the energy which is in it. Every muscular contraction, every thought of the brain, every movement of the body, every contraction of the heart, every heart beat means ~~the~~^{the} expenditure of energy and the consumption of oxygen. Now when one is quiet, he needs but little oxygen and when we come to exercise, the ~~xxxx~~ vessels of the muscles swell out and the muscles receives, when active, as much blood as when idle, sometimes as much blood and we have to take in six or seven times as much air in order to supply that working muscle, in order to keep the blood that is going through the muscle supplied with oxygen. We do not have to take in ten times as much air because when we are actively engaged in vigorous ~~xxxxxxxx~~^{effort}, the consumption of ~~xxxxxxxxxxxx~~^{oxygen is more complete}. The utilization is more perfect and consequently we are making better use of the air and do not have to take in so much in proportion, but the thing I want to impress upon your mind is this: large margin of safety in the lungs. Now a person who gives tuberculosis--I know a man in this city who had trouble with his lungs some

years ago and he lost one lung. This man came to this town thirty years ago to me to examine him and I found one lung completely gone, collapsed, not from consumption of the lung, but perhaps tuberculosis of the pleura. Perhaps he had pleurisy and had to have his chest tapped, and so he lost the use of one lung completely. That man is still an active business man in this city. He looks as well as he did thirty years ago and he has lived thirty years with one lung. Why? Because he had not yet used up his entire margin of safety. Now he cannot run. If he tries to run, he is out of breath before he has gone ten steps because that one lung is not capable of supplying the body with the oxygen necessary. He has lost half his margin of safety, so he is crippled. Now the same thing is true of the heart. The heart ordinarily beats at the rate of about once a second. This heart beat can be enormously increased. I remember a some time ago, a young woman came into my office and her heart was running away so fast, I could not count fast enough to count her heart beats, so the only way I could ascertain how fast her heart was going, was to get a large sheet of white paper and get out my pencil, then with my pencil with one finger upon her pulse and my pencil keeping time, I just made dots upon the paper with each heart beat you see, and I made dots for half a minute and counted up the beats, and found in half a minute, 150 beats. That meant three hundred heart beats a minute. That is five heart beats every second. You see that is going some as the boys say. The heart can contract five times a second and keep it up hour after hour, hour after hour. That was the most active heart, I think, I have ever encountered. Well I still had some doubt. I said, "This may be a sort of fluttering of the heart and not really beating." So I took a sphygmograph, an instrument which records the entire heart beat and I got the tracing. I ~~found~~ timed the strip of smoked paper that run through the instrument, and I got exactly the same results, 300 heart beats a minute, and somewhere I have the graphic record of those heart beats. Now that shows you what wonderful extra capacity the heart has. This is the margin of safety of the heart, so ~~large~~ as to provide for an emergency, such as when you have to run to catch a train, or when we are otherwise compelled to ~~require~~ ^{require} extra ~~work~~ work of the heart

as in a fever and under some other circumstances. Now what I have said about the heart and the lungs is also true about other parts of the body, about the kidneys, for example. The kidneys are eliminating about three pints a day. I recall a case in which a man called ~~gamm~~ here to see me about ~~his~~ his son. He said he thought he might have some kidney trouble, and he would like me to investigate his case. "All right," I said, "bring a twenty-four hour specimen." A ~~day or two~~ couple of days later, I looked out of the window and I saw this gentleman coming along with a dray, saw him standing on the dray and a bushel basket there, and he pretty soon came into my office and the man assisting him, brought in a bushel basket full of two quart jars and there were fourteen quarts of this twenty-four specimen. The young man came to see me then and I had a talk with him, and I said you must drink a good deal of water. "Oh yes," he said, "I do. I take a pailful of water to bed with me every night and a tin dipper, and every little while I wake up and take a drink." And this boy, of course, had to drink even more water than his kidneys eliminated. Now I mention this so you will see what a tremendous margin of safety there is in the kidneys. So with the stomach. I saw an account of a ~~fall~~ sometime ago of a man who had eaten fourteen pounds of beefsteak at one meal. I believe one of the former mayors of New York ate eleven pounds of beefsteak at a contest at which men had their hands tied behind them and they had to go after the beefsteak in regular biologic fashion. Some of you perhaps have seen such contests or heard of them at any rate. That is the way they eat beefsteak; that is the proper way; that's the way the dog does it. Well the stomach was able to digest all this beefsteak. The capacity of the stomach for digesting is simply marvelous. It is ~~limited~~ not so much in the secretion of digestive ferments as in the capacity to handle, to contain and to handle the foods. An interesting experiment made sometime ago by a German professor shows this very well. He took a tube and passed the tube into the dog's stomach, then passed water through that dog's stomach until he had passed 2000 liters of water through this dog's stomach, 2000 liters, that is more than two thousand quarts for a liter is a little more than a quart; 2000 quarts over 500 gallon was passed through this dog's stomach.

Then he tested this water for the presence of pepsin by adding a little HCl to it, and tested its digestive power and found that dog in one continuous session had produced pepsin enough to digest a dog once and a half times its same size. That shows what a marvelous capacity the stomach has, what a great margin of safety. I am not going to say that this margin of safety is to provide for big dinners, because some of you may take lessons from that suggestion and feel that it is perfectly proper for you to make use of this margin of safety. I am sure there are very few people who have not ~~gone~~ already gone beyond their limit in that particular. The purpose of this margin of safety is not to enable one to consume great dinners. That is not the purpose of it. The purpose of this margin of safety and of the margin of safety of the heart, lungs, skin and all the other organs of the body, is to enable one to endure for a long time, the ravages of time, that is what it is for because as times go on, as we grow older, time is working our destruction just as time is wearing upon the hearth, upon everything that ~~is~~ exists upon the face of the earth, and is tearing it down, is destroying it and Old Father Time is right after every one of us and the margin of safety is to enable us to stand up against this destroying influence of time, and the larger our margin of safety, the longer we can stand this corroding influence of time. That is the reason why when we test an old person for example for his lung capacity, it is not equal to that of a young person. Here is a young man who has a lung capacity of 300 cubic inches, perhaps, a tremendous lung capacity, a much larger lung capacity than that has been shown by some. Now when that young man gets to be 75 years old, his lung capacity will be somewhere about 180 ~~or~~ perhaps, not 300. Why? Because the muscles have shriveled and shrunken, the elastic cartilages which must bend when the lungs have expanded have become ossified. You cannot imagine how much surprised I was when I had an X-ray examination sometime ago and found my cartilages were not ossified yet, so I concluded I was still young, so there is still hope for me to expand my lungs, to increase my lung capacity a little. Ossification generally begins along about 40 or 45. In some persons even earlier than that. I was examined the same day with a young man who considers himself a healthy man--a young man not quite forty, I think thirty years

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and ~~xxxxxx~~ his cartilages were ossified very much more than mine. So as I said, I felt quite proud of that fact and it cheered me up considerably because I was brought up to believe that I would not live till I was twenty. It was said that certainly I could not live till I was thirty. So when I found myself still with some evidence of use at 63, I ~~am~~ hoping that I can live on for a little while longer.

Now this margin of safety is the thing that keeps us alive. I remember very well sometime ago, a man came here and I found he had a tumor of the kidney. He was a circuit judge from Ohio and a man of considerable prominence and a very able man and a most excellent man, one of the most charming men I ever met in my life and I was very sorry to find he had this terrible tumor that was giving him terrible pain. He was suffering all the while. It was shortening his life, in fact, and it was necessary to remove the whole kidney. After the kidney was removed and he recovered from the operation, he came to my office and he said, "New Doctor, I belong to the 'one kidney' club. There are five of us" and he mentioned four friends of his who had had the same operation, and he said, "Now I want you to tell me just what how to live because I know I have got just one kidney and I cannot have this operation repeated and I have got to take awfully good care of it." So I marked out a course for him to live and he followed it up to the letter. This operation was performed some twenty odd years ago, and five or six years ago, the judge came back to see us. He had enjoyed good health; he was a man over fifty at that time and he had been enjoying good health for more than fifteen years and he came back here and I couldn't do anything more for him this time, because arteriosclerosis had begun and that kidney had become worn out with the extra work it had to do, and his renal efficiency was away, away down and all we could do was to make him comfortable. I could not say very many cheerful things to him ~~as~~. He improved a little while he was here, then he went home and I knew he had but a very, very short time ~~as~~ left, but if he had had now the other kidney, you see he would not have been reduced to that extremity. We have three times as much kidney capacity as we absolutely need. That is, a man can live with two-thirds of one kidney. He can lose one kidney and lose one-third of the other

kidney and still live. There is a limit, however, to the kidney capacity and after the whole margin is used up, then he must die. Now what has this to do with Sanitarium treatment? The thing I want to impress upon your minds here, is that our whole business here in this institution is to increase the margin of safety so as to increase the life expectancy, so if possible to lengthen out one's days by economizing his safety margin.

Here is a man using tobacco ~~for~~ for instance--I have often met such men and labored with them. I was exorting a man a few minutes ago, just before I came in here. "Doctor," he said, "I knew you would get after me. I just told a friend of mine as soon as I met you, that you would just go for me about my tobacco." I said to him, "A man who is in public life, I think he ought to set a good example to other folks, especially when he knows better." Well a man, who uses tobacco as this man has, sometimes said to me, "Well it doesn't hurt me any. If tobacco ^{would} hurt me., I would stop its use at once. Of course, I am not such a fool as to do a thing that would hurt me, but it doesn't hurt me at all. I have got used to it so it doesn't do me any harm." But there is where men are deceived. A man does not know that tobacco is harming him until after his margin of safety is consumed, you see. It is only after his margin of safety is all gone that he begins to appreciate that it has been doing him harm. The same thing is true of alcohol. People say, "Oh it doesn't do me any harm. Why if cocktails hurt me, I wouldn't take them, but I really feel good after them. They seem to do me good, so I am going to keep on till I find it is hurting me and then you may just believe, I will stop right off." But when a man gets to the ~~time~~ point where he discovers that he is being damaged, that the margin of safety is gone ~~and~~ ^{an} irreparable ~~damage~~ injury has been done and he says then, "What the use of trying to do anything." You see, the prospect must be pretty bad for a man who has reduced his margin, ^{but} ~~the~~ margin of safety can actually be increased. ^{I know it,} ~~anyways~~ I have seen it done. I might tell you another little circumstance, an experiment done in Germany sometime ago which was very interesting to me as it showed the recuperative power of the body. A physiologist did a very cruel experiment upon a rabbit. He opened the rabbit's body and ^{he} cut ~~out~~ off half its

liver. Three months later he re-opened the abdomen of that rabbit and found the rabbit had a liver just as big as it was before. The rabbit had reproduced the half of the liver that had been removed. When he said, "Let us see now what will happen if I remove the other half." So he removed the other half of that rabbit's liver and at the end of three months, opened the abdomen and the other half had been reproduced. So you see that rabbit had a brand new liver. It had actually been reproduced. It is marvelous what vitality these internal organs have, what wonderful things they will do. We sometimes have occasion to do operations upon the stomach, and Prof. Cooper (?) who has made special study of this subject tells us that when the stomach has been operated on and portion of the stomach wall, the mucous membrane containing the glands that make the pepsin and the acid have been removed, the stomach actually goes to work and reproduces these glands. The skin cannot reproduce glands in that way, but the stomach can. These internal organs--quite a number of organs in the body have this recuperative power.

A missionary down in the Sandwich Islands some years ago, told of an interesting observation he made. They had down there a curious kind of land crab that is very particular in its habits. It lives upon the shore in little crevices in the rock and it goes down to the seashore every morning to get breakfast. The land crab, as I said, is very particular about its habits. If it gets a leg dirty, it does not wash the leg.--it does not understand about the use of water for such purposes, but it deliberately nips it leg off. It is not worried because it knows that in six weeks it will and then it will have another nice new leg as good as the other one was, because the crab carries around a series of leg buds under its shell. The same thing is true of lobsters. They get to fighting and tear off one another's legs in the most reckless manner, and in a few weeks the legs are reproduced again just as good as ever. Well a missionary saw this land crab run down to the shore one morning and watched him. He fell off the edge of the rock and fell into a mud puddle and he crept out upon the dry ground and surveyed himself for a moment. He saw that every leg he had was soiled. He proceeded immediately to nip off every one of his legs and slowly

dragged himself home into the rock by his nippers and in six weeks he came out with a brand new set of legs. And now you can take an earth worm and cut it in two in the middle and one half of that worm will grow on a head and the other half a tail, so you have two worms instead of one. Now if you take one of these curious little pollets~~?~~ out of the sea and chop it into mince and sow it broadcast into the water, every single one of those little bits will attach itself to a rock and become a full sized Pollet(?) so you see there is a marvelous recuperative power in nature and we have some of it in ourselves. We cannot ~~lose~~ lose arms and legs as the lobster and crab can, but we can actually improve our livers, stomach and other internal organs which has to do with our animal life which are of the greatest vital importance to us. Now you want some further proof of that applied to the body itself. I will tell you a case:

v-p

12,500 Stereopticon Lecture.

We had sometime ago an elderly man who came here who had serious bladder trouble. He had stones in the bladder that had to be removed. When he came to take the renal efficiency we found it to be only 35% of what it ought to be, only 35%. Instead of being 100 % it was only 35, only about one-third of what it ought to be. I said, "Your case is too serious for operation. You have not nearly margin of safety left in your kidneys to carry you through the operation. The anaesthetic will kill you. I would not dare give it to you so we treated him carefully and patiently and waited for three months. At the end of that three months his renal efficiency was increased to 65% instead of 35 and we did the operation for him and he went sailing through it beautifully and today he is enjoying splendid health. I have seen this many a time. Whenever we are preparing a patient for an operation we always take the renal efficiency test because the anaesthetic is probably the worst part of the operation. An eminent eastern surgeon made the remark sometime ago that surgeons never killed patients. ^{is} It ~~was~~ always the anaesthetic that does it. It is certainly very rare that the operation itself is responsible for death now days. It is the anaesthetic. That is the dangerous part of the operation so before we give an anaesthetic we always know the renal efficiency and with great care we find it is possible to build people up, to increase their renal efficiency until they are able to bear the operation and that we are constantly doing here. If a patient's renal efficiency is low, we refuse to do the operation until it is high enough so it is safe to have the operation done. Now don't you see that this increased renal efficiency is just as useful for a man as a means of extending his life as it is of a means of carrying him through an operation because old father time is operating on us all the time. The inroads of time are being made upon us continually and the time will sometime certainly come when the margin of safety of some vital organ will be consumed and then it will be impossible for us to live longer. The vital chain will be broken. Now you know the strength of this chain is only

the strength of the weakest link. The weakest link determines the strength of the whole chain because when one link breaks the whole chain is broken and if one link only has half the strength of the other links when that link breaks the whole chain is broken and is useless, so it is with the body whether it is the heart link, the lung link or the brain link, the stomach link, the kidney link, or any other vital link in the chain of important vital organs in the body, whatever one it is, when that link breaks the golden cord is broken. Well, now let us have a few pictures. Death comes as the result of a complete breakdown of the forces of the body. Just a few pictures to show you how to cultivate an increased margin of safety. See these children at play. These children are building up their margin of safety. If one of those boys was put into a cage and kept there he would have a very small lung capacity. When he was twenty he would not have more than half of the lung capacity he is going to have if he engaged in active, vigorous outdoor sports. It is noted in Colorado that when the horses come from the east and get into these mountains they are short of breath and not worth very much for some time. They have to be there about six months before their chests ~~expand~~ expand and their lungs have become sufficiently large so as to enable them to breathe and work in that region. Now these boys are building up their margin of safety and accumulating this capital of health that will carry them through the hardships of life. Here are a lot of girls learning to swim. We have classes for the children of the town in some of our swimming pools during the summer. I have a little playground at my house to set a good example for the town in getting them interested to do something for the children and after some years of effort in getting the thing done, I arranged a playground in my own back yard and you see a couple of hundred children there every day in the afternoon in the summer time. I open my playgrounds when the schools close in the spring and close them again as soon as school is opened in the fall so we keep the boys and girls off the streets and give them an opportunity to cultivate good health and vigorous bodies and a large margin of safety. Grown people can improve with exercise. I have been telling you how the lung capacity can be

fast and after breakfast, between meals, after dinner and after supper. I expect some of you think we overdo it. I am sorry everytime I look into the gymnasium that I do not see more people there. There are a great number of people here missing one of the best things we have here. We have recently, by the way, introduced another kind of exercise and that is weaving. Some of our people say, "I don't like to caper around in the gymnasium, I want to do something useful." We have just started a new department of manual labor for people who want to do something useful. We have got two or three rooms down here in which you can weave a net. If some of you gentlemen should take a notion to weave a net and take it home to your wife as a surprise, it would be an evidence that you could make yourself useful in the family. The young lady who has charge of this work is very skilled. She is in our normal school and is giving instruction in net weaving and basket making in order to pay her expenses through our normal school. She is a very excellent young woman and I am glad to recommend her highly as a teacher and as a young woman. She has been engaged in this work before in another institution and is very capable. The charge is very small, only fifty cents a lesson. A lesson may last an hour or two as you may have opportunity and you have the use of a room, and the lady was showing me tonight, a very beautiful mat she had woven. It only takes a little while to weave a mat that sells readily at the stores for four or five dollars and at the same time you have excellent work. Special pains is taken to make the work effective as a means of exercise by keeping the chest high, then in using the arms, the lungs are made to work and when the lungs are made to work, the heart is made to work so the heart is steadily strengthened. Now many people cannot exercise as freely as they would like, especially people who come to the institution here, they have not the power to take as much exercise as the body really requires, so we have the Mechanical Swedish movements and it seems invaluable. The shaking and vibration and all the various movements, ~~like~~ each one has a special value. Here you see some of the other movements. Here is a movement which is really a very useful thing. It helps to drain the blood out of the abdomen where it has been stagnating and kneading machines and the friction machines are also useful. Here is the manual training and the sloyd work. Some years ago we had this department in which we give special attention to woodworking. This was

very fashionable in Sweden and particularly in Denmark, and we imported the superintendent of this kind of work for the schools of Denmark, a man who had ~~given~~ attention to this work all his life, what is known as alloyd and I found it really very helpful. I remember one lady I met in Nashville, found her ill in bed with heart trouble. She was so feeble she was given up as a hopeless case. The doctors said she could not live very long. I looked the case over, thought there was a chance to help her perhaps, and brought her home with me at her request. It was a very delightful thing to me ~~which~~^{six} weeks later to find this woman standing at one of these benches making some dainty little wood models and at the end of three or four months she went back home. Her heart was not well, of course, she still had the same organic trouble there, but her margin of safety had been ~~k~~ enlarged so that she was ~~able~~ able to live ten or twelve years longer. It was only recently that she died and she had ten or twelve years of the most useful life, not only for herself but for the community. I am sure the sloyd had a great deal to do with it. It was very good for that woman to have something to divert her mind as a healthy attitude of mind has so much to do with recovery.

Now this band ~~xxxx~~ you see here connected with this machine goes around the trunk, over the liver, stomach, colon and the shaking movement stimulates the activity of these organs and the circulation of the blood through the organs and it very often relieves^a miserable heavy distressed feeling in that region of the body as nothing else will do.

Here are the vibrating bars. This is wonderfully effective in relieving neurasthenic sensations, nonsensations and chilly and creeping sensations. These are all wonderfully relieved by these vibratory movements. The vibrating chair especially is wonderfully resting also. The languor and the depression that neurasthenics often feel are frequently relieved entirely by spending a few minutes in the vibrating chair. Here we have the manual Swedish movements in which movements are administ~~xxxx~~ered by an operator. These are especially useful for persons who have acquired special weaknesses as weak abdominal muscles, who have weak ~~xxxx~~ hearts so that they are not able to take a large amount of ~~xxxx~~ exercise. Here are other of these movements, showing the various movements. People who cannot take exercise enough in a voluntary way, need these exercises

to train them up to more vigorous exercises. Here is a manual movement which is very valuable, indeed. In this movement, the patient holds his leg rigid and the operator raises it. In this way, the muscles of the leg and of the back, in fact, of the entire trunk are exercised. The abdominal muscles particularly are brought into place. The weak condition of the abdominal muscles is one of the conditions which is most commonly present in patients who have led sedentary lives and is one of the most damaging of the acquired weaknesses of the body. Here are some more of these manual movements. These are active passive movements. We have the strength testing machine. If any of you have not had your strength tested and your chart made, you certainly ought to have it done so you may know how much you have improved while you are here. This is testing the strength of the thigh extensor muscles. ~~The~~ band is put around here you see, the *lower end* of the limb here as near the end of the bone as possible; then the leg is forced back, the extension muscles of the leg are in that way tested. Here is a test of the flexor muscles of the forearm being taken. One of the most important kinds of training is the training of the body to correct posture. This is the correct posture for sitting in an ordinary chair, but the back is not supported. This space should be filled in so the back will be supported. This can be arranged by putting a cushion in the chair but it is better that the chair itself should be made with a forward curve of the back and the back should be inclined forward so that the body can rest against the back. A correct position in standing can be acquired by a very simple manouver. Simply stand with the head, shoulders, hips and heels against the wall. Also the hands against the wall; then the head is bent backward sufficiently to raise the chest from the wall; then the person steps out from the wall and the body is in exactly the correct position, so a person can get a correct standing posture without any training.

Here is a folding exercise table which we find very useful. It is here in the horizontal position and various exercises can be taken in this way. Here is the table in its inclined position. The head is down. By this exercise, one leg is raised and the head is raised. This brings the abdominal muscles into very very strong action. Here is the horizontal table with the patient using the muscles of the back in vigorous fashion. Here with the head lowered and the hands resting upon the bars for support,

the legs are thrown upward, then separated and closed. In the position the abdominal muscles are exercised, also the muscles of the trunk. Here is a splendid exercise for curvature of the spine. By putting the body into this position, the muscles of this side are made to contract, so as to correct the curvature. Here is another exercise which strengthens the muscles of the back which are very strongly used. Here is an exercise for the leg. The leg is drawn up, then forced back and forced out. In this way, very strong action of the abdominal muscles is accomplished. Here are some breathing exercises with the body in an inclined position to allow the blood to run down out of the liver and stomach and other internal viscera. Here is another breathing exercise with the hands placed under the head. This is a strong exercise for the muscles of the trunk. The feet are supported by this strap and the body is extended beyond the end of the table and you see it is a very vigorous exercise suitable only for strong persons. This is a very important exercise, lying in the reclined position, the hands placed at the lower part of the abdomen, and in connection with breathing, the hands are drawn upward and the viscera are lifted up into normal position. This little handle and cord are for the purpose of lifting the body up at first. After a while the muscles become strong enough so the body can be raised to this position without the aid of the cord. Here is an exercise for persons who are not strong enough to take exercise with the head down. Here is the same thing with the body raised. The body can be more easily raised ~~with~~ in this position than with the head down. Here is a very vigorous exercise for bringing all the muscles of the trunk into play. This shows the different positions in describing the *July* circle. It is really a very vigorous exercise, indeed. I do not know of any one exercise which is more effective in correcting weaknesses of the trunk and abdominal viscera than these exercises by the table. I am going to tell you something more about training sometime, ~~but~~ but will let you go now as it is bedtime. I thank you for your attention.

End.

Meat

2, Le Oct 22/14

Mad Bread - meat, oysters
7

mountains or
Strength - of elephant, horse, 7
5, 6

monkey
dogs, 6, 7
reindeer 7

deek after

Gall bladder removed, 18, 19

~~oysters~~
oysters, etc, 22

~~late dinner late dinner~~
Not business at all ~~that keeps~~
~~or deviled lobsters~~

man swells ~~but it's~~ deviled
~~deviled~~ ^{stewed} lobster, deviled

oysters and crabs. 20
Oct 22-'14

Oct. 22 '14

Meat man
~~nerve~~ man
A dollar a piece for
Bifsteaks 3 times a day

22

Oct. 22 '14

"Lost his bifsteaks + got well

22

Six o'clock
Hearty dinner making invalids
Numerous wrecks by the 1000's

22, 23

~~Keen interest~~

Q-u-e-s-t-i-o-n B-o-x L-e-c-t-u-r-e

At the Sanitarium Parlor, Battle Creek, Michigan

Thursday, October 22, 1914 at 8 p. m.

by

J. H. Kellogg, M. D.

Question---What is the cause and cure of pellagra?

Answer--Nobody knows. It is believed by a number that pellagra is a disease due to poisons which enters the system through the intestine, and personally I believe this is the probable cause. It is a form of intestinal autointoxication--toxemia, possibly a specific of peculiar form. At any rate we find that patients get well with pellagra if they are treated just as we treat any bad case of autointoxication. There is another disease we have to treat here quite frequently known as sprue. People who go into the Orient come in contact with some specially bad germs there which produce a disease which is known as sprue, a soreness of the mouth, various bowel symptoms and other symptoms and several years ago I noticed quite a similarity between these two diseases. We found we were able to cure sprue by a special anti-toxic dietary so we treated cases of pellagra, treated cases of pellagra exactly as we treated sprue, and to our great delight, our patients who had not done well before under treatment, began to get well and we began to cure the cases of pellagra. Now when we have a case of pellagra come here, we expect to cure it. If the disease is not very far advanced so that degeneration has begun, we expect to effect a cure and we have succeeded in such a considerably number of cases that I feel it is right to give encouragement that pellagra is a curable disease, especially if we can get hold of the patient before the latter stages of the disease.

Q--What should be done for a callous on the bottom of the foot?

A--Now a callous is an effort of defense. You know when a young fellow gets home from college and gets back to the old farm and goes out to help the hands in harvest

time, his hands get awfully sore and are terribly blistered, but after three or four weeks he doesn't suffer from that any more; for he has blisters before he has callouses not; where his hands were sensitive, now there is a thick, though, hard ~~xxx~~ skin that defends the sensitive tissues, so that this development or callous is simply a defensive process. Now the same thing is true with the callous on the soles of the feet. The callouses produced by nature to protect the tender tissues underneath. The callous always comes at points where there is pressure and the purpose of the callous is to protect the tissues underneath, but unfortunately nature always over does the thing somewhat, as she often does as a matter of fact. A person sometimes has some stomach disturbance, gets to vomiting and ~~xxxxxxxxxxxx~~ does not stop even when the stomach is unloaded but keeps right on vomiting and vomiting and vomiting for days. I have known this to occur when there was no occasion for the vomiting to continue, so with fever. Sometimes there is an infection and fever results as an effort of nature to get rid of the poisons but the fever rises higher than is necessary and becomes harmful and sometimes produces a serious injury. When a person has typhoid fever, it is necessary for him to have a temperature of 101. That is a part of the curative process, but when a temperature gets up to 102, 103, 104 or 105, that is too much, so we have to lower the temperature and to control the vomiting. So we have to control pain which is another very benefic~~ix~~ant thing. We never could get along without pain at all. If it was not for pain, we would be likely to do ourselves irreparable damage. A child, for instance, when it puts its hand in the fire for the first time, if it didn't do any harm, might burn a fringer off just for experiment. Pain is necessary to warn ~~xi~~ us of danger. It is one of nature's most beneficant safeguards, so with the callous. While the callous is an uncomfortable thing, it is protective. Now the thing to do is to remove the cause. That is what we should always do in combatting disease, look after the cause. Now the cause is too much pressure on some point. We must take that pressure off. In the first place we will get rid of the callous because the thickened skin itself becomes a cause of increased pressure, and the way to do that is simply to soak for sometime in very hot water, say for half an hour, then put on a poultice, a bread and milk poultice is just as good as anything else, or linseed meal, anything

that will keep it moist, but it is well that the cloth should be moistened with soda ~~water, a teaspoonful~~ of soda in a tumblerful of water, moistening wht cloth with this soda water and putting that over the callous and letting it stay on over night is very effective. That will soften the tough skin and then it can be scrapped off and can be gotten rid of and if necessary, a very sharp knife may be used to aid in eliminating the toughened skin, and this will give temporary relief, and then to prevent the formation of a callous again, a protection should be formed by means of buck skin or chamois skin. Several layers of buck skin or chamois skin arranged together and ~~the~~ whole should be cut out of this little cushion just as large as the callous and this should be attached to the insole in the shoe, so that after the shoe is put on, the point at which the pressure came will be protected by the chamois skin pad; for there is a little hole inside and that will let the callous fit into the hole and so relieve the pressure upon that point and give it an opportunity to recover entirely and to overcome this special sensitiveness.

Q--Do you approve the use of compound liquors for an inactive state of the bowels?

A--No. All medicinal drugs are bad; all laxative drugs are bad and all drugs are harmful more or less if long used. I asked this very same question when I was in Vienna last of Dr. Falta, who was first assistant to Prof. Von Noorden, the great German physician at that time at Vienna, now located at Munich and may be on the battle field for all I know, a very eminent physician known the world over, perhaps the most learned of all medical men who live at the present time as an internist. I said to Prof. Falta, with whom I was spending an hour or two every day to find out what I could of the methods that have been developed in their very interesting clinic, I said, "What does Prof. Von Noorden do for constipation?" His answer was, "diet." He said, "Dr. von Noorden gives the patient a diet of coarse bread and coarse food and vegetables and fruits." I said, "Suppose he had a very bad case, constipation that did not yield to the regulation of diet, what would you do then?" "Diet," he said, "diet just the same." I said, "But suppose it was a very very bad case and all kinds of diet had been used and all sorts of treatment and still it did not yield, and what then?" "Diet," he said, "diet is the only thing." "But," I said, "wouldn't you ever use drugs at all?" "Oh in an emergency, of course, in some emergency, but never habitually for chronic constipation. Because," he said, "nothing is so bad as the chronic use of drugs." That was a new use of the word chronic. I had never

heard it used in just that way before, but it struck me as being very appropriate. People who use drugs regularly should be called "chronic drug takers". They have a chronic disease; they have a chronic habit of drugging. "Nothing is so bad," said Prof. Falta, "nothing is so bad as the chronic use of laxative drugs." And licorice powder is simply one form, a rather pleasant form of drugging the bowel and it is not good. "What harm" you say. Well there are two harms. One is that these drugs, any drug no matter what it is that produces a movement of the bowels by irritation any drug which in small amount will cause the bowels to move, must accomplish this effect by irritation and any drugging that acts upon the bowels by irritation in this way, produces sooner or later a catarrh of the bowels, a catarrhal condition of the bowels. Now how is this brought about? The drug produces congestion and when congestion results, then the resistance of the parts to attacks of germs which are always in contact, the resistance of the parts will be diminished, so that disease will be produced in the form of colitis or infection. It is just the same as we see in a great many other ways. A person takes cold and begins to sneeze. The cold is simply the result of an inflow of blood. He has a long chill. Perhaps he has been exercising out of doors, got to ~~perspiring~~^{perspiring}, then the wind blew on him and he was exposed and got to feeling chilly and pretty soon began to sneeze. The reason for that was that the blood was driven in from the surface of the body and the mucous membrane of the nose became congested so that it pressed upon the delicate sensory nerves of the nose and that produced sneezing. Then there is simply a watery discharge from the nose. That is because the blood vessels are so congested that some of the water of the blood is squeezed out through the thin membrane and ~~escapes~~^{escapes} and after three or four days, this watery discharge gives place to a whitish or yellowish discharge, a thick yellowish discharge. Now it is a different situation. This is infection. At first it was nothing but congestion, but after a few days it becomes infection. Why? Because the germs from the air that are always finding lodgement in the nose, when the mucous membrane becomes congested, these germs are able to attach themselves and to grow there in the nose and develop and the great number of germs developed there give rise to this discharge of yellowish or whitish or greenish mucous from the nose. It is due to the growth of germs. If the color is yellow that means one kind of germ. That is a particular germ that is growing there, a germs that

makes a yellow pigment. If it is green, it is because there is another kind of germ that makes a greenish pigment that is growing there. If it is white, it is because there is another germ,--the streptococcus albus is growing there and that produces a white color. So you see we have the explanation of this. It is a very simple one. The congested condition lowers the vital resistance and that encourages the germ to grow. Now it is exactly so in the intestine. The congestion induced by mineral water, by laxative drugs of all sorts, by salts of various kinds, these various effervescent laxatives such as citrate of magnesia, every kind of pill or drug or cascara sagrada, licorice powder, anything of that kind which causes the bowels to move by irritation which has a medicinal effect, such a thing will soon produce injury to the bowels sooner or later. Now there is another harm that comes from the use of these drugs and that is this: the bowel, the intestine is accustomed to be stimulated by the mere contact of food. You know if a person tickles you ~~it~~, for example, if a person is tickled at the sides of the body or the bottoms of the feet, you know what the effect is. It produces a tremendous effect. If a person tickles the bottom of the foot for example, it is likely to make the leg draw up suddenly. You cannot restrain it. If that tickling is continued some little time, there may be some action in the opposite direction as well. You know the tickling itself is a tremendous stimulus. Now the food causes the bowel to act. Peristalsis we call it. The food causes this action of the bowel by tickling the bowel. That is the way the movement of the bowels is produced, by contact with food. It is a titillation, not irritation. When a person tickles the bottom of the foot, it does not make a sore there, it does not irritate it or make it bleed. It is ~~mere~~ ^{mere} contact with the surface of the skin and it is entirely harmless so far as the skin is concerned. Now in the same way when the food acts upon the bowel in a normal way, it is simply this delicate titillation that causes a reflex action that makes the bowels act. Now another action which causes peristalsis, or which stimulates the bowel to act is: the formation of acids in the intestine. In the colon, the natural condition of the colon and of the small intestine also is slightly acid. The intestinal fluids are alkaline and in the upper part of the intestine there is an alkalinity produced by the outpouring of the bile and the pancreatic juice, but further down, the contents of the small intestine become slightly acid, due to fermentation. There is fermentation produced by acid-forming germs which act upon the starch and sugar and

produce lactic acid and this lactic acid is the normal stimulus of the intestine, and in the colon the same thing is true. This lactic acid fermentation should continue in the colon. Now every mother knows that the baby, a nursing child, that the bowel passages the ~~bowel passages~~ stools are slightly acid. There is a slightly sour odor to the stool and so long as the child has this sort of movement, so long as the bowel contents are slightly acid, the child has natural movements and remains perfectly healthy. If the stools become excessively acid which may be the case sometime if the child is given too much sugar, there might be an excess of acidity of the stool. Then there is a diarrhoea and the bowel movements will be too frequent, but no great harm comes to the child unless this continues too long. This is not a state of poisoning, it is not what is known as acidosis, it is only a slight irritation that might result in carrying off an excess of the salt of the child's body, but it can easily be stopped and the child can be easily relieved of this condition. There is another condition known as acidosis which comes from eating too much fat in the food and that is a very harmful state. That is a condition in which the body is filled with poisons and the child may get into a very serious condition from this cause. That is why cows' milk does not agree with infants so well as their normal food. It is because cows' milk contains too much fat and that is the reason that buttermilk agrees better with the child than the ordinary milk, cows milk, raw milk and why skim milk can be tolerated by children, skim milk that has most of the cream removed, when full milk will not agree. It is because of the excess of fat. I am dropping in this idea constantly here. The bowels normally move by the stimulation of acids. When a person gets long in years, perhaps after they have passed from infancy into childhood, and from childhood and gone a little farther, if we examine the stools we find that they are no longer acid but are dark colored and have a foul ~~putrescent~~ putrescent, stinking odor. They have the odor of rottenness, of decay so that the bowel passages become exceedingly offensive. They are like the passages of a ~~dog~~ dog or a cat and for the very same reason. A cat for instance when it is a kitten is fed on sour milk and its bowel passages are not offensive, but when the old cat is around catching mice and gnawing bones, eating bits of meat, etc. the bowel passages are horribly offensive for the reason that they represent simply putrefaction of animal tissue. The putrescence and decay of animal matter, it is the dead rat smell with

which every housekeeper is familiar, a dead rat that sometimes gets into a closet or under the floor somewhere and the whole house is in a horrible condition because of the effluvia sent out from that decomposing rat. Not it is because the rat is flesh and the same thing happens to a piece of beefsteak or mutton chops or an oyster or any other animal thing that is swallowed into the body. If it is not completely digested and absorbed at once, then the remnant that remains behind rots, decays, putrefies in the colon and that is what causes a bad breath; that is what makes the offensive perspiration, that people complain about, the offensive odors of the body and that is why people use cosmetics to get rid of these odors, rather to cover them up for they do not get rid of them. These offensive odors come from the putrefaction going on in the colon and

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and that is what makes bad breath. Bad breath once in a great while comes from bad teeth but not very often. It sometimes comes from a catarrhal condition of the nose but the common cause of bad breath is the foul situation of the colon. That is just what it means. Dentists have told me more than once that they can always tell when a person is suffering from constipation or inactive bowels by the breath for the breath actually has a fecal odor. It is a very common thing for the doctor to recognize the situation of a patient's bowels by his breath because these poisons are carried all through the body and thrown off through the lungs. Now I am trying to tell you why laxatives are particularly bad. I have explained to you how it is that the bowels is stimulated by delicate means, by mild and delicate stimulants, by the mere tribulation of the food through contact and by the stimulation of such mild acids as lactic acid, the acid of sour milk, for instance. Now put sour milk on our hands and it doesn't do any harm. It doesn't do the mucous membrane any harm either but it is simply a mild stimulant. It does not attack or irritate and destroy the mucous membrane. It is simply a harmless natural agent to which the intestine is accustomed so this normal stimulation while it is very powerful and quite sufficient for the health of the bowel it does not do the slightest harm. Now when a person finds his bowels a little inactive and makes use of cathartics or laxatives, pretty soon he has to take something stronger. He begins with Hunyadi water or something of the sort, for example, and in a little while he has to increase the dose. He starts with a teaspoonful, then a tablespoonful. By and By he begins to take half a tumblerful. He begins with a small dose of sulphur perhaps and after while has to take a quantity of it. Then he takes a small dose of epsom salts, perhaps a teaspoonful and after while he has to take a tablespoonful and I remember an old gentleman 74 years of age who came down here from Grand Rapids several years ago and he said, "Doctor, my bowels cannot be moved. I have tried everything and I have

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gotten so I just simply cannot take medicines enough to move my bowels. Now I have always used patient medicines and I have always moved my bowels but I had to take so much I had to give it up. He said, "When I was a boy about a dozen years old my mother had the custom of bringing us all together every Friday night and give us a dose of salts allaround." He said every member of the family had to take a dose of salts so he would be in good condition for Sunday. He said, "This was the family practice and it was always kept up while I was at home and when I went away from home I found I had to take salts and after while had to take it every day and it kept up until I have got to the point at last where it takes more than a half a pound of epsom salts to move my bowels" and he said, "Now they won't move even then." Now that is the natural result. I might mention another case to you. A lady was brought up here from Illinois a good many years ago by her doctor and the doctor told me about the patient, how she had gotten where she was. She was taking morphia in large doses. The doctor said he gave her twelve grains of morphia on the road up here so she had taken quite a lot you see. The doctor said, "Now I am going to stay here two or three days until she gets started" and she didn't get started until he got away. There was no use. The doctor had been in the habit of humoring her for every little thing, giving her a drug of some sort. I got the history from the doctor and the patient just how she got sick. She was the chairman of the entertainment committee of her church and they were getting up a social and she had to help about it and take the lead in it and she was very ambitious to make it a success, to have a church social and a fair to help raise some money to help eke out the preacher's salary, a very ridiculous way of doing it in my opinion, that is, it is not a business way at any rate. The lady found herself tired and worn out and she went to the doctor and said, "Now doctor, I have got to have something to keep me up till I get through this fair." So the doctor gave her some quinine pills and she felt pretty well for a few days. Then she came back and said, "Doctor, those pills don't seem to be quite enough so the doctor gave her some strychnia pills

little

to stimulate her a little more and she got on very well then for a while.

After the fair was over she had other troubles coming on, one thing after another and had to have something more to keep her up so she went to the doctor again and this time he gave her some arsenic in addition so she kept on taking quinine, strychnia and an arsenic pill in addition. She had an arsenic pill three times a day, a strychnia pill three times a day and quinine every night and morning. About this time she began to feel nervous at night and could not sleep so the doctor gave her bromide of potash to make her sleep and it worked pretty well but when she got up in the morning she felt so miserable she had to take some pills and had to increase the dose of strychnia and add another arsenic pill after while. By and by the bromides would not put her to sleep at night. She would get toned up so high in the morning that she could not get toned down enough to go to sleep at night so the doctor gave her chloral, then morphia after while. The morphia would tone her down so much that in the morning she had to have something a good deal more vigorous to tone her up so the doses and tonics were increased more and more. Well, then about that time she began complain about her bowels being so inactive. Morphia would paralyze the bowels you see so the doctor had to give her laxatives of various sorts and kept on until when she got here she was taking several grains of quinine a day and several doses of strychnia, several doses of arsenic and twelve grains of morphia. To move her bowels the doctor had gone through the whole list of drugs until even croton oil had been used and finally she had gotten to the point where the doctor said nothing under the heaven would move her bowels but a teaspoonful of mustard seed every morning before breakfast, a teaspoonful of mustard every day before breakfast was the only thing that would move her bowels. That was the condition she had gotten into from taking drugs. The bowels, when drugs are used, after while become so accustomed to this violent stimulation that the natural, normal delicate stimulation of food and the stimulation of the lactic acid in the colon are entirely insufficient and that is why it takes so long for a person with chronic constipation

to get well, you see. A person with chronic constipation has gone through this whole category of drugs stimulating the bowels in every possible way, whipping, whipping them until the natural stimulus does not answer at all.

I have thought a great many times of an experience I had when a boy. I had to take a hundred mile ride to go on a journey of 100 miles and I had to take another boy. We went along together and we were given a very nice looking horse, a fine gray horse, and felt quite proud of this fine gray horse that we had to drive and we started off and got on very nicely for a little while but pretty soon we discovered that we were not going very fast. We were walking along. The horse was walking very slowly and we thought we would start him up, that we would give him a little time to get warmed up and so we began to talk to him about going a little faster. He didn't seem to take any of our hints at all. We talked to him and passed hints along the line and they didn't seem to have influence upon him whatever. Finally we began to apply the whip gently to his back and that didn't seem to have any effect either. Then we began to apply the whip a little harder and it had not the remotest influence upon that horse and we discovered that horse had been whipped and whipped until his back was so calloused that he did not feel whipped at all and the only way we could ever get him to move along at all was, we finally stopped at the road and cut down a little pole, sharpened off the end of the hickory pole and without actually rupturing the skin at all, we found that by one of us standing in the ~~center~~ front end of the wagon and projecting this pole in a forward direction somewhat now and then, the horse finally began to understand that we wanted him to move along a little faster but it was pretty hard digging. Nothing but a goad, in other words, would do him a particle of good or stimulate him the least bit because his skin had been calloused. I learned afterwards that the man who drove this horse was just in the habit of keeping the whip playing upon his back all the time and the horse's back had been whipped until the skin was so thick he could not feel any of the stimulation. I think that is a fair illustration of the condition of the colon in a great number of people who have taken drugs of various sorts and

it has the most baneful effect of all effects of drugs perhaps. The colon that has been stimulated for years and years with drugs is a very hard proposition to deal with. Now there is this wonderful thing about it. When we return to the natural stimuli, an increased bulk of food and food that produces acids in the intestine instead of producing alkalies, ammonia and other alkaline substances by putrefaction, it is sometimes very marvelous how quickly the bowel will resume its work. The bowel, after all, will very often recognize these normal stimuli when it will not recognize the artificial stimuli of various sorts of any kind whatever so I must say with Dr. VonNoorden that nothing is so bad as the chronic use of drugs even though they may seem to be such a simple thing as compound licorice. It is not the licorice that is active at all. It is very similar to the idea of senna and other things.

Q. Is the deposit of lime in the joints attributable to hard water?

A. No. The lime of hard water is never deposited in the joints. There is a very good reason for that. The bowel is the channel through which the surplus lime of the body escapes. Salt ordinarily escapes through the kidneys and the skin. Lime escapes through the bowels so when a person drinks hard water the lime in the hard water is simply carried off with the rest of the unusable material. The lime is not absorbed or if it is absorbed it is at once excreted so that it does not pass into the joints.

Q. Can a laboring man do hard work without eating meat?

A. Well now suppose I should ask the question, can a laboring animal do hard work without eating meat. What would you say to that question? Can a laboring animal do hard work? Can an ox, for instance, do hard work without eating meat? Can a horse do hard work without eating meat? If an ox can do hard work without eating meat and if a horse can do hard work without eating meat or if an elephant can do hard work without eating meat, why not a man? Why not? "Oh," but you say, "man is a meat eating animal!" I think it is Lord Byron who said, some years ago, who set the idea agoing that man is a carnivorous product, he must have prey but none of the biologists agree with

him. The biologists say that man is an improved monkey and that ^{he} is so nearly like the monkey tribe, the other members of the monkey tribe, I should say, he is simply smarter but so nearly like them that it is impossible to draw a line, a distinct biologic line between the higher apes and man so we are all included in the one great class of primates. The gorilla and chimpanzee and man are all included in one biologic class known as primates. This is a certain class of animals just as a certain class of animals known as bovines and the carnivorous animals so-called flesh-eating animals, the felines, the cats and the lions, all these sea lions are one class. Man belongs to the great class of primates and not a single primate that lives ever did live so long as anybody can find out ever ate meat except man. He is the only one. Here is another thing that is wonderfully interesting is that a dog that does not eat meat can do harder work than a dog that eats meat notwithstanding he is supposed to be a carnivorous animal. I remember some years ago I was travelling through Belgium and I noticed some huge dogs pulling milk carts down through the streets. In Belgium and Holland you will often see these great dogs going down the street pulling an enormous load of milk cans, perhaps a woman walking along beside the cart to steady it or guide it, with a big dog under the cart or in front of the cart pulling it along and it is amazing to see how much strength these animals have and the wonderful endurance of the dogs, a hunting dog for example, is something very, very remarkable. The marvelous endurance and hardihood and the intelligence of the shepard dogs of Scotland, it is the wonder of the world some of the performances of those wonderful shepard dogs. Now it is very interesting to know that these hunting dogs and these shepard dogs and these hard working Dutch dogs are not meat eaters. The hunter never gives meat to his dogs. He might on some special occasion but when the dog is going on the hunt he has corn meal and oatmeal and graham bread and dog biscuit. He is not fed meat. I guess almost everybody that knows anything about dogs knows that dog biscuits are a great deal better than meat for dogs and the reason is that the dog biscuit contain a lot of bran and are chiefly composed of cereals. If

there is any meat at all in dog biscuit it is very little indeed, just enough to give it a flavor. The shepard dog never has meat yet he is one of the most intelligent dogs in the world and the most enduring dog so meat is not necessary for a laboring animal or for a laboring man. Of course, up at the North Pole those sledge dogs must eat meat but this thing has noticed up there and that is if a dog is fed only on lean meat, it very soon loses its power to work and the men who eat meat up there must have fat meat, not only fat meat but they must have some vegetable food. Those northern people up there killing ^{the} reindeer when there is nothing growing that they can take. They kill the reindeer and take the half digested reindeer moss out of the stomach of the reindeer and eat that in order to get vegetable food. The esquimaux gather every little berry and a great many cranberries and blueberries that grow in the summer time, in the short summer, up in that region, they gather every little thing that is edible. Not long ago I received a mass about a foot square and an inch thick of a very black stiff looking stuff, black as soot, from a missionary nurse away up in the northern part of Alaska, among the wild Indians, and she said she found these Indians were in the habit of eating this seaweed. Every summer and fall they gather the seaweed and dry it in the sun, press it into cakes for use in the winter. It is not food but it gives bulk to the intestine. It is really very palatable. I will try to think to bring some in some one of these days and let you sample it. It is not bad at all. It is very much like the Colax that we use here which really is essentially the same thing.

Q. What is the cause of catarrh of the throat and how can it be cured?

A. Sometimes it helps one to take a sip of water. It is better to take hot water than cold water. Hot water gargled in the throat will often give a good deal of relief. The inhalation of steam is one of the very best of all the remedies I know of. There is nothing so good as the inhalation of steam. It should be taken into the throat very hot. The tube should be carried away back into the throat and it should be taken just as hot as it can be taken. If you haven't any better apparatus for the purpose you can get a piece of rubber tubing and attach it to the spout of a teapot or coffeepot. Leave the cover

off the pot or leave it on a little loose. Put the tube into the mouth some little distance and draw the steam in. If it is too hot, blow hard first and blow the steam out of the pot and then breathe it in. In that way you can have the temperature of the steam in the throat exactly what you want it. We make a sort of teapot especially for this purpose but any kind of tea or coffee pot would answer the purpose perfectly.

Q. Upon what theory do you advocate exercise immediately after meals?

A. This exercise is so light that it accelerates digestion by increasing the breathing. Breathing is very necessary for digestion. We do not digest well while we are asleep. The glands secrete all that and the digestion takes place in the stomach but the food does not move out of the stomach so readily. It stays in the stomach too long. Exercise helps to pass the food out of the stomach into the intestine and so passes it along to where the whole digestive process can be completed. The way this occurs is this. The stomach lies just up under the diaphragm. Every time the diaphragm comes down it gives the stomach a little hunch, so to speak, and pushes the food along so this little agitation which is produced by the diaphragm up and down is very helpful to digestion and is necessary for prompt and vigorous digestion. There is another thing about it also that is very useful. When we stimulate respiration we increase the suction power of the chest. The chest is a double acting pump. It pumps air into the lungs and blood into the heart. It works as a sort of duplicating pump. At any rate it has a double effect. When the diaphragm comes down it sucks air into the lungs but while the air is coming in it also exercises a suction force upon the blood vessels and so draws the blood in from the heart just within the chest but at the same time the diaphragm comes down it compresses the liver and compresses these large vessels in the abdomen here and forces the blood out of them upward into the chest so there is both a push and a pull you see here. There is a suction and a compression and both acting to affect the same thing to force the blood out of the abdominal organs on toward the heart. Now this effect of emptying the large vessels, the

emptying of the large vessels of the abdomen is a stimulant of absorption from the stomach and intestines so the whole digestive process is greatly aided by gentle exercise, not only the movement of food from the stomach into the intestine and along the intestines and the colon but also the absorption of the digestive foodstuffs from the intestine.

Q. Do not the lower animals, as a rule, lie down and rest after a full meal?

A. Animals like some people generally eat too much. An animal that has to hunt its food often gets very hungry and it eats too much. When it eats too much there is a condition of repletion. A large amount of blood accumulates in the abdomen here, the blood is drawn out through the brains and the animal feels drowsy but do not be deceived. That dog that is lying down in the corner behind the stove, after he has had dinner, is not sound asleep. Make the slightest noise and see what happens. He will just open one eye and look at you. You have seen him do that many times. Then he shuts that eye up. He is having a siesta. He is just resting after dinner. Once in a while though he has the misfortune to fall asleep and then he has all kinds of unpleasant dreams. He growls and snaps when you disturb him. Now the same thing happens to you when you fall asleep soon after you have eaten a dinner or for an afterdinner siesta. The dog does not profit by the afterdinner sleep any more than a man does. There is another thing, talking about dogs, in which we can follow their example very well. Physiologists often keep dogs for experiments. Every physiologist has a place where he keeps dogs and takes good care of them and he is all the time trying various experiments, not cruel experiments. If they are cruel experiments they are performed under an anaesthetic but experiments upon diet. These dogs are put into little treadmills and made to work and the breath is studied to see how much carbon dioxide they exhale with a certain amount of work and they are put into rooms in boxes and the air is examined and all that has been learned about metabolism

the most important things that relate to diet, the most important discoveries have been made upon dogs and rabbits. Dr. Brown-Sequard, one of the great French physiologists in whose laboratories I worked at one time told me that he believed rabbits were made for physiologists. He did not think they had any other use in the world except that they were made for physiologists to experiment upon. Of course, I do not agree with him in that at all. These physiologists have noted this very interesting thing and one physiologist takes particular pains to call attention to it, that dogs show a great deal better sense than people do. For instance, he says, "It is my dog that I am feeding large quantities of food just as much as he will eat and working very hard. Now when this dog has two or three days off and does not work he stops eating. He does not eat half as much as he did other days when he works. If I keep him in a room quiet where he does not work, where he has no work to do, for two or three days, he cuts his diet down at once to almost nothing." He said the average man does not show ^{as} his good sense as the dog does but when a man finds he hasn't anything to do, he is not working, he does not need food but he eats something to stimulate himself. He takes something to work up an appetite when he doesn't need the food. For instance, he will put mustard, black pepper, cayenne and capsicum into his food and in that way excite his gustatory sense so as to make it crave food when it he does not need it. That is responsible for a great many ailments that men and women suffer from. It is eating when they do not need to eat. Now, as a rule, and it is a good rule, I am sure you will find very profitable indeed to practice and to give heed to, a rule that can be followed almost universally if not absolutely universally but it is almost always true that one should never eat unless he is hungry, never eat unless he is hungry. One should never eat because it is meal time, for example. Well, one says it is twelve o'clock. I guess it is dinner time. Of course, we had a late breakfast this morning, didn't get breakfast until nine o'clock and it is only three hours since breakfast. I really don't feel as though I care for dinner but then it is dinner time and I guess I will have to eat because I will get hungry before suppertime if I don't

and so sits down at the same table and now then there is that dinner put right into the stomach with a half digested breakfast already in it and I want to say to you that you cannot insult your stomach in any worse way than that. There is nothing you can do to your stomach, hardly anything at any rate, unless you swallow some caustic substance, some poison, nothing you can do so bad for the stomach as to take food into it when it already has undigested food there. I will grant it makes a difference. There are somethings one can take under such circumstances. For instance, one can take an apple or fruit of any sort except dates, figs and bananas which are too hearty foods. One can take any sort of juicy fruit, apples, peaches, plums, cherries, grapes or apple juice or fruit juice of any sort so if one wanted to do so he could sit down at the table and could eat a little fruit of some sort but bread and butter, meat and potatoes, eggs and things of that sort, hearty food, pies, cakes, pastry and ice cream; those things are particularly harmful and damaging and never ought to go into the stomach. Some of them ^{never} ought under any circumstances and certainly substantial foods of any kind never ought to go into the stomach when food is already there undergoing digestion. You see when food is taken into the stomach under such circumstances, the time required for digestion is enormously extended. Suppose the stomach requires five hours for digestion. Food has to stay in the stomach five hours. That would be about the average time. It takes five hours for the stomach to empty itself. Suppose after the stomach has been at work for three hours you take in another meal. Then you see the stomach ought to be emptied ~~expiring~~ in eight hours at any rate but it will be ten hours before it will be emptied because after it has digested a meal or partly digested a meal the stomach is tired. Its glands are exhausted. Its muscles are tired and the stomach is tired and needs rest. The stomach should not be kept going all the time. When the stomach has worked five hours and has emptied itself, it is not a proper thing to put something into it immediately again but the stomach needs an hour or two of rest so we cannot eat physiologically really **physiologically**

there

unless we give the stomach a chance to rest and we really ought to be six or seven hours between meals. Some of the most eminent French physiologists, doctors, require their patients to have nine hours interval between the meals, that is, for persons who have slow digestion. It is surprising how many people come to this institution and go down to the X-ray department to have their stomachs examined. It is surprising how many people have seven or eight hours required for the digestion of food. The emptying time of the stomach is seven or eight hours even nine or ten or twelve hours and such people eating three times a day, the food is simply heaped up, never catches up except once in a while when a person forgets to eat his supper or has a long night's rest. When we take those cases, some of them we find some food left even the next morning. This continual contact of food with the stomach and the acid gastric juice, this continual contact with the mucous membrane of the stomach creates irritation, gives rise to ulcers and the ulcers give rise to cancers and any number of people are simply preparing a way for a most horrible sort of death by carelessness in this very particular. I remember an old Irish doctor who used to say that most people dug their graves with their teeth and it seems to be literally true that of people who abuse their stomachs in this way.

Q. On which side it is best for one to lie when asleep?

A. I used to give people explicit directions about how they should lie when sleeping but after while I awakened to the discovery that I could not control my patients when they were asleep. It was as much as ever I could do to get them to obey orders when they were awake but the average patient would not pay any attention to orders at all when he went to sleep. He would sleep in any position in which he had a mind to when he was asleep in spite of anything I might say about it. For instance, when a person lies down to sleep he is on his right side and when he wakes up he is on his left side. I have made up my mind that it really does not make any difference. So far as I am concerned I am very thankful to remain in bed when I am asleep for I sometimes

find myself half way out on the floor or pretty nearly there. I have got so accustomed to being called and awakened from sleep that it is really very hard work to keep in anyone place and to keep still. I should think if a person has a stomach that is dilated or very much prolapsed I am quite sure it is better for that person, when he lies down, to lie on the right side because gravity then helps somewhat about the emptying of the stomach but Dr. Cannon by numerous experiments, I think has proven quite conclusively, that in general gravitation does not have anything to do with the movement of food from the stomach to the intestines or along the intestines and the reason is the specific gravity of the intestinal material and the substances inside of the intestine is almost the same as that of water so that gravity could not act because an equilibrium is established all about the material right on the outside of the intestines and within the intestines there is such a perfect equilibrium established that gravity does not act so directions to lay upon one side or the other so far as it relates to digestion is of no account except in those cases in which the stomach is very greatly prolapsed or in which it is greatly dilated and in which the pylorus is open and those cases are not so very common.

Q. What causes autointoxication?

A. Germs and a meat diet and constipation. Those are the three things in combination which make the very worst kind of autointoxication but one may get autointoxication from the free use of eggs and even from the use of milk if milk does not digest very well.

Q. Is autointoxication injurious in a very bad nervous condition?

A. Autointoxication is the principal cause of the nervous condition.

Q. Is automobiling injurious for a very bad nervous patient?

A. Now it depends entirely upon two things, well I should say three things. It depends upon the automobile and it depends upon the driver of the automobile, the chauffeur, and it also depends upon the speed of the

automobile. Certainly there is nothing more quieting, I should think or soothing, to a person who is nervous than to ride in an easy, well made heavy, first-class automobile with a real good driver in whom he has perfect confidence and at a moderate rate of speed the movement through the air is agreeable moving about and bringing different things before the mind is helpful.

Q. What is the reason for the following found in the urine:

Pus cells, epithelia toxins?

A. This means a mild autointoxication, and possibly a catarrhal condition of the bladder or the kidneys. It is a condition that ought to be investigated. The next thing that ought to be done in such a case as that is to make a bacteriological examination. That ought to be done.

Q. What is a cure for freckles?

A. Stay indoors, lose your health and get pale.

Q. Will removing the appendix leave a person constipated?

A. I have met quite a number of cases in which persons who have had the appendix removed were worse than they were before. The trouble was these persons suffered from something besides disease of the appendix. They probably had adhesions of the pelvic colon and also incompetency of the ileocecal valve. That is what we have found in several of these cases that I have had to operate upon. I have found the ileocecal valve incompetent, found the pelvic colon adherent so sometimes these conditions are formed after the appendix is removed. ~~As~~ as a result of operation. These adhesions are formed after the appendix is removed as the results of the operation. Sometimes removal of the appendix deforms and injures the ileocecal valve. This is a question that I am sure surgeons will give more attention to in the future than they have in the past.

Q. Is it ^{all} right for one with hyperchlorhydria to take apples, sweet oranges and acid things if they do not cause pain?

A. Certainly. If they do not cause inconvenience they are perfectly wholesome. Pain is caused in these cases by acid fruits only in cases

in which the mucous membrane of the stomach has become diseased so that the stomach is hyper-sensitive. I should say also that in some cases of extreme hyperhydrochloria due to excessive secretion of the gastric acid, the effect of acid fruits is to stimulate this formation of acid somewhat and in such cases their use must be suppressed temporarily.

Q. Do you regard woollen underwear as best for middle aged persons in winter?

A. No, certainly not. The best thing to wear next to the skin is cotton. There is nothing so good as cotton to wear next to the skin and over that woollen for cold weather as it is a warm fabric.

Q. How can I reduce my blood pressure?

A. You must get rid of the cause. The most common cause is intestinal toxemia, poisons absorbed from the colon. ^A High-blood pressure-lowering diet is essential, that is, a diet which contains very little protein, a low protein diet excluding meats of all sorts, a diet which will secure three or four bowel movements a day is very important/^{and} in some cases it is necessary to use the friendly ferments as the bacillus Bulgaricus, for example.

Q. The glands in my lower jaw are enlarged and bother me very much. Give a possible cause.

A. Enlargement of the glands in the jaw is an indication of infection. These glands enlarge as a means of protecting the body. There are certain glands and the germs/^{that} get into the body in general have to go through one line of glands and another line of glands, often still another line of glands. They are like the three lines of forts encircling Liege . They are for the purpose of protecting the body and the germs have to break down first one line of defenders, then another and then another, before they get into the city and the enlargement of the glands is an evidence that there is infection, that the germs are getting in and the glands are enlarging in order to be able to fight them and reinforce them you see.

Q. What is the cause and cure for ^{high} ~~low~~ blood pressure?
that

A. That is quite a large subject ~~as~~ we will consider when we can have an whole evening for it. It is one of the most important questions that can be considered. When one finds the blood pressure going up it means that old age has come. Old age has come. Now it may not be old age of the brain. It may not be old age of the stomach but old age has come somewhere. It may be simply old age of the kidney. A man is as old as his arteries a French physiologist said but it is just as proper to say a man is as old as his liver or that a man is as old as his kidneys and a man is as old as his skin. A man is just as old as any vital organ in the body. It is important to remember that. When a vital organ loses its efficiency the whole body goes down because the strength of the body is like the strength of chain. The strength of a chain is the strength not of the strongest link of the chain, not the average strength of the links of a chain but the strength of the chain is only the strength of the weakest link in the chain so that when that one link breaks the whole chain is broken. Now so it is with the body. The age of the body really is the age of the oldest organ in the body. That is the organ which is most damaged, the organ which is the weakest, the organ which is the least healthy, ^{which has} the least life left in it and when high blood pressure comes that means always if it is continuous, habitual high blood pressure, some organ of the body has become old. This old age process may be going on in the brain especially or it may be going on in the kidneys especially. That is where it is most likely to be and high blood pressure in a young person means almost always advanced or beginning disease of the kidneys and it is a thing that must have immediate attention. There are two things that prevent people from giving attention to this matter of blood pressure. One is they do not understand the importance, the significance, the very grave significance of it and another thing is they think it is a hopeless thing anyhow, that nothing can be done for it. Now both of these attitudes of mind are wrong. Let me just mention a case. A lady

came here ten years ago last spring, a very prominent woman whose name is familiar probably to everybody in this room, I was very much surprised and shocked to find her blood pressure 240 although she was only a little more than fifty years of age. I endeavored to explain to the lady about the situation. She was very nervous, she was depressed, she could not sleep, she was pale and unable to go on with her work. She occupied a very important position and was quite a prominent woman in a national society so she came here to spend a few weeks for treatment to see what could be done for her. When she had been here two months her blood pressure had lowered somewhat but it was still pretty nearly 200. It was 180 at the end of two or three months. She felt somewhat discouraged. She stayed a month longer, kept steadily going down. After two or three months got down to about 160, but it was still too high. Then she had some matters she must give attention to and afterwards she came back and her blood pressure had actually gone down to 145 or 150. She had followed most scrupulously every direction that had been given her in the matter of diet, had cut out meats, mustard, pepper, tea, coffee, everything of that sort from her bill of fare wholly. She then remained with us about eight weeks and left here with her blood pressure 124. It took a year to do it, part of the time here and part of the time at home, but in one year's time this lady had reduced her blood pressure to 124. Last year she came in here with her husband for a few days' stay last January, came down to our Race Betterment Conference. I noticed she was not looking very well, took her blood pressure. The lady is now over 60 years of age. I took her blood pressure and found it to be 200. We she was considerably alarmed and I confess I felt very much distressed about it because I did not believe we could ever get it down again. We had succeeded once in getting it down and I knew she had been living very carefully. There was just one remark that encouraged me. She said, "Dr. Kellogg, I want to confess to you that the last year I have been eating some meat. My doctor thought I ought to have a little meat, so I have not eaten a great deal, but now and then I have taken a little meat." That was very good news to me. I was sorry she had eaten the meat, but I knew if she had been living right

up to all the things that I had instructed her to do and her blood pressure had come up, that there wasn't any other thing to do that would be really effective. I felt considerably impressed some years ago when an old patron of ours who had been coming here for twenty-five or thirty years said, "Now, Dr. Kellogg, I want you to come here. Now then, he said, "I am the doctor and I want to give you some advice. You are not doing right. You are working too hard. You are not taking proper care of yourself," and he said, "Now I want you to understand one point. I think you have forgotten or have overlooked the difference between you and me. When I come here I am an old sinner. You make me reform and I turn over a new leaf and get better right away but," he said, "here you are living up to the best you know all the while and when you get sick what are you going to do? You can't stop smoking, you can't stop drinking tea or coffee. You can't stop drinking whiskey. What can you do? And he said, "When you ~~better~~ break down you are a goner and that is all there is about it," he said, "you better begin to take better care of yourself." Well, I confess that lecture made quite an impression on my mind. I think it is the best piece of advice I ever received because it really did bring to my notice a point which, while I had thought of it ~~casually~~, at the same time I had not been impressed by it as I should have been. I am not saying that I have profited by this sermon as much as I should have done but that is why I thought about this lady ^{when} so I heard she had been eating meat I said, "Thank the Lord for that. There is something we can do for you." She came here and spent eight weeks with us and went away with her blood pressure 130. Now that is a ten years' battle with high blood pressure starting in with 240 and at the end of ten years at 60 years of age her blood pressure still down at 130. That means that good woman has fifteen or twenty years yet, perhaps ~~ever~~ twelve or fifteen years yet of useful life instead of being blotted out in a year or two as she certainly would have been ten years ago if she had not found the right way to live and it is all in right living. After you once get the blood pressure down you can keep it there by right living and the sooner you can get that thing accomplished, the

better it is. Three or four things are of the utmost importance: First, an antitoxic diet. Second, three or four bowel movements every day and that is imperative to get good thorough bowel movements. It is necessary that that should be accomplished without drugs. Even with drugs it would be better than not to be done at all but it must be done without drugs in order to be really thoroughly effective and to avoid producing harm in the end.

Q. I am troubled with saliva mostly in awakening in the morning. What is the cause of it and what will cure it?

A. Increased activity of the salivary glands is generally associated with irritation of the stomach. Pawlow remarked that when there was gastric juice in the stomach there was generally an appetite so he said appetite means juice. Now appetite also, when appetite is present, there is a free flow of saliva. You know when you smell something really good that you have a great liking for, it makes the mouth water. It not only makes the mouth water but the stomach too and the pancreas and all other glands useful for digesting food. They all begin to pour out their secretion when something that is pleasant and tempting to the taste is noticed when one is hungry but this would not be true when one has eaten paraffin to repletion. When the stomach waters the mouth waters. All of these organs are associated and this association is sometimes more extensive than is desirable. I remember very well a lady I used to feel very sorry for. The moment she began to eat and the saliva began to flow a stream of serum would be to flow out of her nose at the same time. The glands of the nose were associated with in sympathy with the glands of the mouth and so she continued to use her handkerchief. It was a most disagreeable thing as the result of this association which had become so extensive on account of disease so when there is an excessive flow of saliva in this way it probably means that there is an excessive secretion of gastric juice. The case is probably one of hyperhydrochloria.

Q. What foods must a person avoid who has had the gall-bladder removed?

A. Beefsteak. He must not eat any beefsteak or mutton chops or any kind of meats because he is now an animal without a gall-bladder and I do not know of any animal except vegetarian animals that can get along without gall-bladders. The elephant is a splendid specimen of a vegetarian. He has no gall-bladder. The donkey has no gall-bladder. He is another very good vegetarian. Sometimes you see donkeys forty or fifty years old and still able to work after having endured all sorts of hardships and bad usage for I never knew a donkey yet that was well used and these animals get along without any gall-bladder. so if a man hasn't a gall-bladder he must be a vegetarian any way.

Q. Why are not malted nuts a better vehicle for the culture of the Yogurt bacteria than cow's milk?

A. Because these bacteria require some casein which is not found in malted nuts.

Q. I have a slight swelling of a joint of one thumb. What causes it?

A. Have an X-ray examination and the X-ray examination will show whether it is rheumatic trouble or not.

Q. What causes contraction of the esophagus that produces a lump in the throat?

A. This condition often exists in connection with hyperacidity of the stomach. When there is too much acid in the stomach it is very likely to produce this condition. However, it is very often produced by a simple nervous condition. Hysterical girls complain of a lump in the throat and that is due to the contraction of the esophagus, a reflex action.

Q. What is the average weight of a man per foot?

A. I will have to refer you to a little book. There is no average of this sort. It depends upon the build of a person what the weight is. There is no rule that is applicable in this way. Some men are built with
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very long legs and very short bodies. Of course, the average weight would be small. Small people generally are tall because their legs are long. You notice sometimes when a tall man sits down you will be surprised to see how short he is when he sits down. Again a man who looks short when he sits down is tall. Well, I was walking along the corridor down here some years ago with a man that was rather tall, considerably taller than I was at any rate, several inches taller than I was, and I noticed that he had rather long legs and he was making some remarks about my small stature so I said, "Let us sit down so we did and I was two inches taller than he when we sat down but he was two inches taller than I was when we stood up so" I said, "you see it is mostly legs after all" so we finished our controversy. If you look at the little book entitled, "The Sanitarium Diet List" you will find a little table in there and you will also find some discussion of this question of the relation of weight to height. There is a relation which is of some interest. You can get that book at the bookstand in the Palm Garden.

Q. What shall a business man do when he cannot have his principal meal until 6:30 P. M.?

A. Well, I admit this is a pretty hard proposition. A business man must make up his mind to either sacrifice something in relation to that evening meal or else to sacrifice something in relation to his health ^{or} and his business. A man who takes a hearty meal at 6:30 and goes to bed and tries to sleep at ten o'clock is going to be waking up along about three or four o'clock in the morning or he sleeps so lightly that the sleep won't do him very much good and after some years he is pretty certain to begin to suffer from insomnia and he will, of course, naturally think about his business so he will think it is his business that is keeping him awake. It is not his business at all but it is those stewed lobsters, deviled crabs and deviled oysters and things of that sort he has been eating along about six thirty or seven o'clock or eight o'clock at night. I could tell you some very interesting stories about that. I know of one man who went bankrupt in New York City simply because his partner

in this case stole his capital and ran away with it. That is the way he became bankrupt but he became nervous so he could not sleep at night and so much so that his doctor sent him to White Sulphur Springs, Virginia to get help for his sleeplessness. He found no help. That man told me the story himself. He said, "I paid a dollar a piece for my beefsteaks so I could be sure to get the very finest kind of steaks. I went to a theatre nearly every night and after the theatre I always went to the restaurant and had a big supper about twelve o'clock." Then he said, "I was up in the morning about eight or nine o'clock and ate a hearty breakfast, then ate lunch at noon at twelve o'clock and then at six o'clock I had a very hearty dinner with big beefsteaks. In fact, I ate beefsteak three times a day. I thought I must do it to build me up," he said, "and keep me up for my business." He had quite a large business but he broke down and could not sleep so his doctor sent him all about the country and one time he was at White Sulphur Springs and he got a telegram that his partner had robbed him, run away and left him penniless and he had to begin to do something. He had practically no money left so he went out to Colorado. He got out there, got a position, learned how to do surveying when he was a boy, and he got a position as civil engineer and travelling over the mountains he pretty soon discovered that he could sleep and ~~would~~ he got up into a mining camp where they didn't have any steaks, where as he said, "grub was very short" and he found he could sleep very well and in a few months he was ^a perfectly well man and he said, "I am sure it is because I lost my beefsteaks" and he became so thoroughly convinced of it that he stopped eating meat entirely and became a rational feeder so these six o'clock dinners are, in my opinion, a great source of mischief. The question is what shall be done. I think there is only one thing for ^{the} business man to do and that is to reform his business habits and take his hearty meal not later than four o'clock in the afternoon. We have got to change society. I don't know how in the world we are every going to do or how we are going to do it. I cannot see, I confess, how the thing is going to be done but there must be a radical change for these six o'clock dinners are making invalids and nervous

wrecks by the thousands. If a man cannot sleep his work very soon begins to run out. Loss of sleep will wear a man out more than any other thing so as long as we have these six thirty dinners, generally later, seven, seven thirty or eight o'clock, as long as we have these hearty dinners at night, we are going to have a constant annual crop of neurasthenics and persons suffering from insomnia and after while get further along to the road and get into the insane asylums, some of them. Lack of sleep, lack of balance, broken down nerves lead to mistakes in business and failures in various other ways, lack of ability to manage. I remember a man, such a case exactly, came over here from Chicago. He went home after a few days, then came back and came into my office and he said, "Doctor, I am the biggest fool that lives. Now I have got down in Chicago two big breweries on my hands." I didn't care much about the brewery business if it did go to pieces but he said, "I had the best manager you ever knew of and I only paid him ten thousand dollars a year and the other day I just got mad at the smallest thing in the world. It wasn't a thing worth noticing at all. I just got mad and swore at him and he handed in his resignation!" Now he said, "I cannot hire him back for less than twenty thousand dollars and I don't know as I can get him for that." He said, "I am just the biggest fool there ever was." He was not the blame for it because he had ignorantly been breaking down his nerves getting himself into such a nervous state that he could not control himself and the smallest things were a terrible irritation to him and he finally got where he had lost all his self control. He was not fit to try to do business. I remember another man who came here who had charge of a very large business in St. Louis and he had gotten so nervous he just could not do anything. The least little thing would fluster him. The least irritation would send him into a fit of passion and he really was not fit to deal with his great business that he had on his hands. He knew it and he had taken a vacation. He didn't know what to do. A friend of his sent him here and he came here very full of prejudice and suspicion. When he had been here about two weeks he was just

thoroughly converted. He found himself getting well and he sent for his wife and children and they came here and his wife got converted. It did not take long to convert here. Women are sensible and see through this thing quick and his children became accustomed to a Sanitarium diet. His wife went down to the cooking school and learned how to cook and he went back and from that time until now he has ~~spent~~ been the master of his business and his business is three times as big today as it was when he came here. Everybody knows about the Simmons Hardware Company. Everybody knows about this enormous business, the biggest business of the sort ever built up, I suppose, in the world. "Keen Cutters" you see everywhere and this man is the master of that business and he remains in perfect health living strictly up the Battle Creek Sanitarium principles. When I was in St. Louis sometime ago he invited me to come up to his house and he said he would like very much to have me come. I didn't have time to go but he said, "I want to show you that my wife is doing it better than you do at Battle Creek." He said, "We have got things in a little better shape. We have got it down a little finer than you have at Battle Creek" and he sent his foreman here, his business managers. He sent them here one after the other and insisted upon their coming. One of them said to me that ~~he~~ came up here and he said he fairly had to fight me almost to get me to come. I wouldn't do it. I wouldn't take any stock in this thing at all but when he had been here a couple of weeks he was converted too. His tea, coffee, tobacco and beer were all gone and he went back home a new man. I don't speak publicly about matters of this sort but this man has spoken so widely himself of what the Battle Creek Sanitarium had done for him or what the principles have done for him that I am sure he would not object to my telling you about it. It has been worth thousands and thousands and hundreds of thousands of dollars to him to get his head level, his nerves steady and be able to stand there as captain with twelve thousand men working for him and two thousand folks in his business office and he is absolute master of it and does ~~not~~ it easy without any wear and tear simply because he is taking care of his corporal mobile? just as he would of ~~it~~ his car.

meat 2 box

(1)

Dec. 28, 1914

Poisoning by eating
liver of polar bear

(polar bear, dog)

Polar bears in Arctic region
has not a single germ in
his interior (?) 6

~~the~~
The real reason why the
use of meat is harmful 6, 7.
more depravity - borne of
meat eating than of alcohol
drinking 7.

Christmas beef 7 with bad breath
4 Do Patient "It" doctor,
if doesn't make any differ-
ence to me what I eat
doctor - "It makes a difference
to me what you eat, etc." "

2/ Meat, Dec. 28 ? ✓

"A regular walking
managerial" //

Diabetes, meat in 19, 20

Bad Breath.- "It doesn't make any difference to me what I eat".

Doctor: "It makes a difference to me what you eat, etc."

Question Box Lecture, Dec. 28, 1914, p. 11.

QUESTION-BOX LECTURE At the Sanitarium Parlor,

Battle Creek, Michigan, Monday, December 28, 1914 at 8 p. m.

by

J. H. Kellogg, M. D.

Question: Does Dr. Kellogg eat meat?

Answer: I don't think I have ever been asked that question before. I have been asked the question before, "Do you eat meat when you are away from home?" and I have always answered that in the negative which is the truth and I am able to say and with some satisfaction to myself too, that I have not eaten a pound of meat--well it goes back so far I have to reckon up a little--well it is almost forty-nine years. It will not be very long before it is fifty years, half a century and I do not expect to find any occasion on which I shall be obliged to eat meat again while I live on this mundane sphere. If I was a way up at the North Pole I would not hesitate to eat a piece of polar bear if there was nothing else to be eaten, but I would be very careful not to eat his liver, because if I did I should expect some other polar bear would eat me. It is a very interesting thing that the liver of the polar bear is very deadly poison. ~~Rasm~~ Mikkelsen made a trip in that direction, a great Danish explorer, and he stated that on one occasion his entire company of some nineteen men, I believe, were made very sick indeed, by eating the liver of a dog and the natives of that country, the Eskimo, are very careful to avoid the liver of the seal for these organs are found to be very very poisonous, indeed. The symptoms are very marked. A person becomes very sick after eating the liver of dogs. That is, the ^{meat} ~~liver~~ fed dog or the meat-fed bear or the fish-fed seal. A person becomes very sick. Vomiting, purging and other symptoms of acute poisoning appear, and in a few days there is an eruption of the skin and the entire skin peels off. So those are the symptoms which ordinarily accompany very intense food poisoning.

Q--Would you consider milk, uncooked cereals and fruit juice a sufficient diet for an eighteen months' old child, or would cooked cereals also be necessary and vegetables?

A--Well, of course, it is possible for a child of eighteen months to live on milk alone.

It is not the best diet, however, because when a child reaches the age of about three months, it is very necessary that the child should have something besides milk. Milk is not quite a perfect food. It is a perfect food for a young baby but not a perfect food for an old baby. Now you may say that is a very heterobastical statement and that it is a reflection upon the ~~Almighty~~ all wisdom of the Creator, that He did not know how to make the right kind of food for a baby, but the whole trouble is, we do not properly interpret the plans and the arrangements that have been made for our welfare altogether. When a baby has no teeth, milk is proper food for it. Just as soon as the baby begins to get teeth, then ~~it~~^{it} ought to take something besides milk. But you say, the first teeth of the child are milk teeth. That is true, but they are not for eating milk. They are not called milk teeth because they are for eating milk, but because they arise while the child is feeding upon milk. Milk contains everything the body needs ~~but~~ just one thing. There is one thing lacking and that is iron. Milk contains almost no iron. Now iron is very necessary for the body. The body does not require a very large amount of iron, but what it does require it needs very very much and it must have it. It takes but a very small amount of iron to meet the body needs, only a few milligrams, but when this small amount is lacking, the body suffers at once and an anemia makes its appearance. The baby's cheeks are no longer rosy. They began to get pale and the child will not grow and it shows evidence of weakness, lack of appetite, etc. It suffers from anemia in other words. Anemic babies are ^avery very common spectacle, especially in cities. Why does milk not contain iron? Because during the first three months of its life, the baby does not need iron. The baby is born with a bank account of iron, if you please. It is born with a surplus of iron on hand. Before the baby is born, it stores up in its liver iron enough to last it three months and it keeps growing upon that supply of iron until it is gone, and during that three months, milk is a proper food as an exclusive diet for the child, but after that time the child needs something more besides milk. It needs some iron-containing foods, so it needs to begin to eat vegetables. The potato is a very nice thing to begin with. A very good thing is

potato puree or thick potato soup is an excellent thing for a young baby. Babies that are not doing well at all begin to thrive often very soon by adding to their daily food, even still while they are nursing infants by adding a little potato puree or potato soup. The young calf begins to nibble grass when it is a few weeks old. Grass is very rich in iron. The calf continues to eat this ordinary food. It is fed by the cow mother still, but it nibbles away at the grass, gets a little grass and with the grass comes the iron that it needs. This point must be remembered when people undertake to live upon a milk diet. If a person is very anemic, it won't do to put him upon an exclusive milk diet, but a diet of milk and strawberries will be admirable because the strawberries contain a large amount of iron, more iron than almost any other food substance known in proportion to the amount of solid material. Strawberries are very rich in iron, so when a person is on a milk diet, it is well to use fruit, particularly strawberries in the strawberry season. It is our custom here when we put patients upon a milk diet as we sometimes do to give them two meals of fruit at four o'clock in the afternoon and at ten o'clock in the morning and with the fruit they get the iron they need so there is no suffering from the loss of this element. A baby cannot digest uncooked cereals. It is hard enough for an adult to digest uncooked cereals, that is, in the ordinary state. Patients who are going to take uncooked cereals should take them in the same state in which the monkey takes them. You never find a monkey sitting down and eating oats or corn. The monkey could not live and thrive on a diet of corn or oats or grains of that sort or rice any better than a dog could. It would be just as impossible to raise a monkey or to support a monkey on a diet of raw oatmeal or raw corn or raw wheat or rice as to support a dog on such a diet. You would not think of giving such a diet as that to a dog, but the dog is just as able to digest it and thrive upon it as a monkey is, or a man or a baby or a child is. People who adopt the so-called raw food diet, we often find them eating raw oatmeal, raw rolled oats and things of that sort, but very little of that kind of food is digested and^a very little is digested, but most of it is simply waste and it acts as bulk and so may not be entirely useless. It may be beneficial. A raw food diet is a sort of partial starvation diet. If we inquire carefully into the bill

of fare of people who adopt the raw food diet, you will find the diet is chiefly made up of cows' milk and the oatmeal comes in simply for bulk. Such a diet is not always to be recommended, especially as a continuous diet. It is possible that a person would get a little iron from the raw oatmeal also. The baby requires cooked cereals if it is to eat any cereals at all. When the monkey takes cereals, it takes the cereal in the milk state. Down in south Africa, the monkeys very often invade the corn fields at night. A large company of baboons will come down to a cornfield at night and in the morning they will be no corn there, but they don't wait until the corn is ripe. They are on hand harvesting the corn crop when it is in the milk state. Then it is just right to be eaten and digested by the monkey or by the baby. A baby can be fed and will thrive on the milk of corn when it is in the milk state. In that state the carbohydrate or starch is not yet hardened. It is not in the form in which we find it in flour but it is in the form of dextrin and sugar. That is why the roasting ears are so ~~fmkk~~ palatable because all the carbohydrates are in the form of sugar in solution. After it gets a little older, then this sugar is converted into starch and so the ripe corn is not ~~smkk~~ nearly as sweet as the unripe sweet corn. Another thing I notice perhaps is that the sweet corn you buy in the market does not seem as sweet as it used to be when you got it out of your own garden. The reason is that the corn gets its sugar from the corn stalk and it comes from the stalk into the cob and from the cob into the little kernels on the outside of the cob. Now when the corn is picked, the supply of sugar ceases to come in. There is some stored up in the cob and some in the corn itself, but as hour after hour goes by the sugar which is in the corn is converted into starch. The process goes on in the corn and remains alive for sometime.

It continues to go on until the sugar is used up, converted into starch and after 24 hours or so the corn has very little sweetness because the sugar has been converted into starch so sweet corn after being picked should be kept ice cold, as nearly freezing as possible without actually freezing it up as that will check the last processes you see for the corn should be eaten at once. The sooner it can be eaten the better.

Q. What is the cause and treatment of nasal catarrh?

A. Nasal catarrh is in the first place due to lowered resistance. If you ever took a hard cold you know how it began. Perhaps you remember the early symptoms. At first you began to feel a little cold and shivering and then pretty soon you began to sneeze, then after a little while the cold in the head as we call it or in the cold in the nasal cavity, a coryza of the nose in which a little water began to run out of the nose and there was a discharge of watery something from the nose. That is serum or salt water coming from the nose. Now this salt water pouring out from the nose is Nature's mode of defense and the reason why this salt water is poured out here is because Nature is trying to protect herself against the germs that are seeking to find entrance into the body through the nasal mucous membrane. When a person takes cold in the nose there is a congestion of the mucous membrane of these congested vessels and when the blood stops and stagnates in the vessels there is a loss of defensive power and the germs begin to swarm in and take possession of the blood vessels and Nature pours out this serum because it contains substances which destroy germs. The serum of the blood contains antidotes against germs, contains germicides that destroy germs so the purpose of the serum is to destroy the germs that are in the nasal cavity. This is perfective and it continues. Now if you have high resistance, if you have a sufficient amount of resistance against these germs that produce colds, you want have any further trouble. That running of the nose will disappear after while and the cold will be at an end but if the

resistance is low, then in the course of a day or two this discharge will become first a whitish discharge, then after while a yellowish discharge and then it may continue for months and months yellowish or a greenish discharge and this is a symptom of nasal catarrh. Now the reason why this catarrh continues, this chronic catarrh, is because you did not have resistance enough to fight off those germs so they got possession of the nose, colonized there and began to grow and Nature is continually sacrificing white blood cells in order to fight off this army of germs and the mucous material discharged from the nose is largely mucous but it contains in it the white blood cells that have escaped from the blood vessels to fight the germs that are continually coming to the surface. Now the reason why you do not get over the catarrh is because your resistance is not high enough to enable you to destroy these germs. When one has very high resistance they need not be afraid of germs. There is no occasion whatever to be afraid of germs. The germs cannot do you any harm. These arctic travellers are not troubled with colds because they have high resistance. When they breathe that cold air of the north their resistance is so high that they cannot take cold. The few germs they encounter are not enough to break down their resistance which is so complete that they are able to destroy all the germs they find in that region but germs are so scarce up there that it is necessary to put a great many cubic yards of air through a filter in order to get one or two germs and even the water of the sea is free from germs and the fishes are free from germs. Take those fishes, analyze them carefully and you cannot find a germ in the fish. Even the alimentary canal contains no germs while here in the alimentary canal of the human being there may be as many as one hundred trillions of germs produced in one day. A big polar bear up there in the arctic region has not a single germ in his interior and that is the reason why the people of that region can live on meat. It is not what is in the meat that does the harm but it is what happens to undigested fragments of meat lying around rotting in the colon like a dead cow in a fence

corner. That is what does the harm. It is not a pleasant thing to think about, is it? But a beefsteak rots just as quick in the body as it does outside the body. It is just the same thing and oysters getting stale lying around outside on the seashore, perhaps becoming rotten and offensive, putrid; you swallow a live oyster and it may be the whole of it, often the whole of it, or at least a part of that oyster will lie around behind some kink in the colon and undergo that same horrid process and it is because of germs in the intestine that set up the process of putrefaction and decay. That is the real thing that makes the use of meat such a dangerous and such a harmful thing. I thoroughly believe that the use of flesh foods does more harm to the American people than the use of alcohol. I thoroughly believe that thing, that there are more people died every year from the use of flesh foods and more people damaged and, I was going to say, more depravity borne of meat eating than of alcohol drinking. Alcohol is bad enough or the use of tobacco either. Now I do not often say that because our tobacco and alcohol are thoroughly bad. I do not want to give anybody the least bit of excuse for taking those things and someone might put it the other way instead and say that Dr. Kellogg said the use of alcohol and tobacco was no worse than a nice beefsteak. That is not my way of putting it at all. That beefsteak I should say is a fragment of a corpse and it may be a very ancient corpsetoo. Did you ever stop to think of it? Why sometime ago Mr. Armour's manager, Mr. Savory, told me that they keep their Christmas beef, that people eat on Christmas day and other days when they want a hautgout with what they eat, he said, "We keep our Christmas beef three months before we ever put it on the market" and when they come to put it on the market it has long whiskers all over it and they have to be shaved off. The mould is an inch or two in length growing all over that meat and it has to be skinned a second time to get rid of the germs and the mould growing on the outside of it and it is very, very tender. That is what they call prime beef. ^{fine} Now prime beef does not mean beef that is particularly **prime**, that is a **prime** fine quality, that is not the meaning of it but it means beef that is extra rotten.

Q. Can hereditary neurasthenia be entirely overcome by a woman over thirty with no organic disease? Will climate and altitude have an important bearing on the case?

A. This question of heredity is a tremendous one. We inherit almost everything we have or we think we do. I remember reading some little time ago of a young man suffering from gout. He said he didn't mind the gout so much but he didn't have the fun drinking the wine that made it. His father drank the wine and he had the gout. The scriptures state the situation this way, the fathers ~~eat~~ ^{eat} sour grapes and the children's teeth are set on edge. Now that is true with reference to neurasthenia. The fathers eat the sour grapes of tobacco and alcohol, if you please, and high living and the children of such parents are very likely to be neurasthenics. They do not actually inherit the neurasthenia but they inherit a special capacity for neurasthenia. They inherit those elements of nerve weakness and of brain weakness and of weakness of will which make them ready subjects, easy subjects of neurasthenia. Now you know when a man takes alcohol he becomes insane. It may be a small dose or a large dose but he becomes insane if he takes enough. A man that is drunk, crazy drunk, we say, everybody knows he is insane. He goes home and beats his wife up, smashes the furniture that he has worked so hard to earn, spoils the beautiful home that is the dearest thing on earth to him, when he is under the influence of liquor and when he recovers himself he hates himself to such an extent that he sometimes goes off and commits suicide. Many a man has committed suicide on recovering from a spree and finding out what he ^{has done when he} /was drunk. It is recognized by everybody that a man who is drunk is insane. If a man gets drunk quite often he by and by gets to a state where he is insane all the time. It is an insane habit of mind and it becomes established so that he is never quite sane. The insane habit of the brain has been established during his long sprees until it finally becomes a permanent condition and he is insane all the time and he has to go to an insane asylum. Now a man that ~~is~~ ^{has} so weakened his entire body by alcohol that every cell of his body is damaged, he has become a chronic

neurasthenic. We may say he is insane and that means that children born after that condition is established are likely to have that stamp upon them, to be born with that stamp upon them. It is time that society undertook to do something to stop the breeding of idiots and imbeciles and neurasthenics and criminals. After while, as Professor Fisher was saying the other night, the cure for civilization is more civilization and we need more civilization of a different sort. We have been giving particular attention to become civilized, as to polishing the brain, to acquiring wealth and accomplishments, the refinement and art of society. That is what we have been giving our attention to and have been forgetting all about the body and the man himself in whom all this effort is put forth is letting the body get into decay, fall into a state of innocuous desuetude as Mr. Cleveland would have said. It is time we should begin to turn over a new leaf and the world is beginning to see ^{that} these questions must have attention. That is why we had last January the Race Betterment Conference. We had a gathering here of learned men from all over the United States and we had a very interesting conference here and the proceedings have been published. They make a volume of several hundred pages, the most unique volume of this sort that has ever been printed, in fact, I suppose the first time ever any such collection of facts were brought together. This was the first Race Betterment Conference ever held but I hope it will not be the last one. We are going to have another one in San Francisco next summer and we shall have a Race Betterment Exhibit over there. There has been organized a Race Betterment Foundation that has an endowment of some three hundred thousand dollars and is going to devote its energies to the propagation of this movement for race betterment.

Q. What is the best treatment for nasal catarrh?

A. The first thing call on a nose specialist and have him look into your nose and see what the situation is. Everything depends upon what the ~~specialist~~ individual requirements are. People do not have nasal catarrh on general principles. A person who has nasal catarrh, one person

has one condition that requires one remedy and another has another condition that requires a different remedy. It is safe to say that every case of nasal catarrh is curable but it requires something more than treatment of the nose. It is generally most important of all to treat the colon. That is the place to begin treating the nasal catarrh is the colon because this mucous membrane very often has simply been reduced to the status of an excretory organ. The purpose of the nose, one of its purposes at any rate, is to enable us to enjoy delicate and delightful perfumes that we gather from flowers and delicious foods that Nature serves to us but when a person allows the colon to become the hold of every unclean and hateful germ and an incubator of germs so the germs are being created there by millions and millions and trillions, when a person allows himself to get into that condition and allows his bowels to become inactive, these poisons produce all these millions and billions of germs which are absorbed into the body, excreted from the skin and they are thrown off from the nose and the mucous membrane of the nose becomes a channel, the outlet, for horrible effluvias if you please and the horrible poisons which ought to go out through the colon instead of being discharged through the nose. A constipated person simply changes the outlets. He allows the backing up of filth until the whole body is polluted. It is like the backing up of a sewer so that the sewerage comes backing up into the house and fills the kitchen and dining room and gets into the pantry and the china closet and the whole house is filled with the filth from the backing up of the sewer. That is exactly what has happened to a person who has backing up of the colon. There is a damming back and accumulating in the body of all these horrible stenches born down there in the colon and they get out through the breath and the nose which adds to the odor of the breath. A man came into my office the other day with such a bad breath that I had to open the window as soon as he came into the room. The moment I caught his breath it was something sickening. It is not a new

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experience either and not a very uncommon experience. His skin was bad, his tongue was coated, horribly filthy, and I began to talk to him about his diet. "Doctor;" he said, "It doesn't make any difference what I eat?" I can eat anything." I said, "It makes a difference to me what you eat." Well, he didn't quite understand what I meant. I went on a little further. I said, "You will have to stop eating meat, I guess, and live on a different bill-of-fare than you have been accustomed to." "Doctor;" he said, "I will eat anything you say while I am here but when I go back I expect to have my beefsteaks. I live at a hotel and travel a good deal and I have to take what I can find and you know the principal thing on the bill-of-fare of the average hotel and restaurant is meats now days so I have to eat meats. Of course, I cannot say I am not going to eat meats for the fact is, I live mostly on meats anyway but I can get along here for a little while but I expect to return to my usual bill-of-fare when I go away. That is what I am here for to be cured. 2 I had to talk pretty plain to him. He was not persuaded easily at all that meat was not very necessary. "Why", he said, "Everybody eats meat. We need meat to give us strength. The lion is the strongest animal, you know, the king of beasts and we must have meat. I don't think I can get along without it for a great length of time." I didn't seem to make any particular impression upon him at all. Finally I said, "Look here. You know what your breath smells like?" "Why, "no", he said. Does my breath smell bad?" I said, "I should think it does. Didn't you notice that I opened the window here a minute ago? It was because I didn't like your boquet a bit." "Well, is that so? Does my breath really smell bad". I said, "Yes, your breath smells just like a dead rat and for the same reason that a dead rat smells bad, for the very same reason. There is decay, putrefaction of flesh going on in your body accumulating" for this man had been telling me how many different kinds of meat he had eaten. I asked him about that for he had been eating at a hotel in Chicago and ate meat and they had some venison and he ate steak and fowl and oysters, half a dozen different kinds of meat he had eaten, including fish, so this man, you see was a regular walking menagerie. He was

going around with a whole golgotha of dead beasts that were dead and decaying and ought to have been buried somewhere else. I think I persuaded him after while it would be a good thing for him to stop eating meat for a while.

Q. Is it well to take pineapple juice to destroy unfriendly germs?

A. Pineapple juice does not do it. You cannot rely upon pineapple juice for killing the bad germs in the stomach or colon. If pure pineapple juice were applied to typhoid fever germs, I think it would destroy them but when it is taken into the body, it is so diluted by the juices of the body that it would not have any such affect.

Q. Are the seeds of figs too harsh for the stomach?

A. No. They do not do the stomach any harm any more than the skin. When they come against the walls of the stomach they do not rasp and grate and tear the stomach but they simply come in contact with it and are tossed along by the movements of the stomach. They do not irritate the stomach any more than the mouth.

Q. Would apples and oranges be a bad combination for a meal composed simply of fruits?

A. All fruits agree together. I cannot think of any combination of fruits that would not be perfectly harmonious. Fruits are entirely compatible.

Q. My blood pressure is only 96.

A. You ought to thank the Lord for that. Avoid a meat diet. I do not find it necessary to advise anybody to eat meat under any circumstances except the absence of all other food that is not less wholesome than meat. A normal blood pressure is 100 to 110 or 120. The body is dependent upon the heart. The blood pressure is primarily dependent upon the heart as a pump. It pumps the life-giving blood into all parts of the body. Every cell must be irrigated with the blood just as plants in a hot country must be irrigated with water to make them grow. The blood vessels are an irrigating system and the heart is a good great central pump that pumps the blood through the irrigating ditches that we call the blood vessels. If your pump is big enough and strong enough so it can

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work very slowly and yet keep up an ample supply of water in the irrigating ditch, then it will not wear out soon but if your pump is rather small, then it has got to work very hard. Now if your pump works slowly and easily, that pump will last a long, long time. It will last a whole lifetime but a good pump that is working slowly and easily and is always kept well lubricated will last as long as a man lives but if the same pump has to work so fast that it hammers and pounds away and jumps and shakes and jars its fastening, it won't be very long before it needs repair or before it is worn out. That is the trouble about high blood pressure. When the heart wears out there is high blood pressure and it has to work at high blood pressure in order to keep the body supplied with blood. When the heart has to work this way, it wears out quickly. A man who has high blood pressure does not ordinarily die of high blood pressure. Once in a while an artery ruptures in the brain but that is not because the blood pressure is high but because the arteries are diseased and softened. Healthy blood vessels are able to resist fifty times the ordinary pressure to which they are subjected so you see the blood pressure can rise away up beyond the ordinary pressure without danger but it is the heart that wears out and the man who dies of high blood pressure by and by begins to get swelling of the feet and the heart cannot keep up its work. It is a good thing to remember that the blood pressure is never any higher than it needs to be. If it is high, it is because it must be high in order to keep your brain and liver and kidneys and other organs supplied with the normal quantity of blood so you see the lower the pressure at which the work of the body can be done, the lower the pressure at which all the wheels of the body can be employed, supplied with blood, the longer the heart is going to last. 96 is a normal blood pressure. Of course, a person with a blood pressure of 96, if he should go out and take some exercise, run a block or two, if he should come in and we should take the blood pressure again, it would probably be found to be 115 or 120. There is a wider margin for variation when the blood pressure is low.

Q. Where can I obtain rice such as the Japanese use?

A. I suppose the brown rice which has not ~~been~~ had the nutritious parts removed is referred to. An effort has been made to put this brown rice upon the American market but nobody would have it. The effort has failed. Rice men who live in the south, a number of them, have made a great effort to put brown rice upon the market. If there is anybody here who wants brown rice, if you will put your order in at the Food Booth in the Palm Garden, this can be supplied to you, but I fear you would not eat it. It is not so palatable, it doesn't look so good and the majority of people do not like it so well. The fact is it is not necessary to eat it. I think it is time the minds of the American people were disabused in relation to this rice question. All the talk that has been made about rice, about the importance of keeping the brand on the rice, etc., all of this talk applies only to cases where rice is made ~~an~~exclusively article of food. If you are ever brought to a situation where you have to eat rice and cannot get anything else at all to eat, then really it is a serious problem but if you add milk to it, take milk along with your rice, it would be a matter of no consequence at all. It is not necessary. You would not suffer any injury if you have milk added to it or have milk to take with the rice or if you have vegetables to eat with the rice. If you have a supply of lettuce or fruits of any kind or lentils, beans, potatoes, or any sort of vegetables, you are not running any risk at all in eating rice. All the evils that come from the use of polished rice, so-called, come also from the use of fine flour bread. Just the same effects are produced. When pigeons are fed upon polished rice, as in some experiments by a commission appointed by the British Medical Society, they get beri-beri. These pigeons very soon got lame. Their limbs were swollen up. They were made very weak and the pigeons became absolutely helpless. It was found that if pigeons were fed on white flour bread the very same thing happens to them. They get beri-beri just the same. It is not a thing peculiar to polished rice but if these

pigeons were given even a very small amount of the bran, they recovered very quickly. One pigeon had gotten so helpless after several weeks of feeding on rice that it had fallen down in its cage and ceased to make any effort at all to move about and that pigeon was cured in four hours after having had injected into it a watery solution of rice and bran. That seemed to cure the pigeon by a miracle. The pigeon began to recover at once and in a little while was on its feet and inside of four hours the pigeon was able to fly when it had been considered within a few hours of death just a short time before. It seemed positively incredible the reports of the effects of the small amount of extract of rice bran. Of course, extract of wheat bran would have produced exactly the same effect. The Japanese, who live very largely upon rice use along with the rice, dried turnips, a large amount of raw turnips dried with a little salt and other dried and salted vegetables. They find that about the only way they can preserve it but they find it very important to make use of fresh uncooked foods to a certain extent.

Q. Are the raw whites of eggs indigestible?

A. No, they are quite readily digestible.

Q. Would you commend the use of menthol and alcohol as an outward application for pain?

A. It is a very superficial remedy. It acts only a very short time and while it is not particularly harmful for superficial pain, I believe it ought not to be used for too great a length of time for it would injure the skin.

Q. Are ripe olives injurious to one with hypo-acidity?

A. No. Ripe olives are a very wholesome way of taking fat, one of the most wholesome ways.

Q. Does the use of lard in cooking have a very strong tendency toward autointoxication?

A. Animal fats are much more productive of putrefaction. They encourage putrefaction much more than vegetable fats. This was pointed out by Dr. Combe of Lausanne a number of years ago and lard even more than tallow or suet.

Q. Are there any instances where it would not be perfectly safe in every way to leave off the abdominal supporter after having worn it a year?

A. Now the purpose of this abdominal supporter is double. It is not simply to support the viscera, hold the organs up in position, but a more important use, a far more important use and one that is generally overlooked is to make pressure upon the abdomen and so support the blood vessels. In persons who have very weak abdominal muscles there is a bulging here and the large vessels of this part of the body, which are so large that they are capable of holding all the blood in the body become, become distended and the blood accumulates in this part of the body. That is why a great many people feel faint while some people have such a large amount of blood accumulating in this part of the body that when they put their hands up over their head, they are likely to faint away. Why? Because when you put your hands up so, the arteries contract. You see there is a difference in color between the hand that is held up high and the one that is hanging down at the side of the body. That is because the blood vessels contract very, very quickly when the hand is held up in this way so when the arteries of the hand contract in this way, the blood vessels of the brain contract at the same time and if the circulation is unbalanced and a large amount of blood is accumulated in the abdomen here, people sometimes faint away. I have known several instances of ladies that had an operation or something, who have been ill, when they have first tried to use their hands to arrange their hair would actually faint away. They were not able to do it. It is because of these contracted blood vessels. In such a person they are just right upon the border, you see, of fainting away all the time and it only requires just a little bit to push them over. The best thing in the

world to do for such a person is the application of the abdominal supporter. It gives strength and vigor and vitality to a wonderful degree. When an Indian is out hunting and he doesn't get anything to eat, he simply takes up his belt and if he doesn't get anything to eat the next day, he takes up another notch in his belt and so he goes on taking up another notch every day and feels better than he would feel without doing that because he is driving the blood out of this part of the body into his brain and muscles and other parts where he wants it. The abdominal supporter then is of use, you see, not simply to support the viscera but to make pressure upon the abdomen and so drive the blood out of this place where it is not wanted into other parts of the body where it will be of real use and where it is needed. I have just taken up a notch in my belt so maybe I will be able to talk more interestingly.

Q. What is the latest development in the treatment of diabetes?

A. I think I will devote a whole evening to talk to you about this. I will just say a word, however, that the subject of diabetes has received more attention from internists, those who give their attention to the treatment of internal diseases, in the last ten years, I think, than any other single disease. It has been ^{made} a subject of an enormous number of researches. The literature is simply ponderous and some really interesting discoveries have been made. One very important discovery is this that the patient suffering from diabetes and who has a large amount of sugar, discharging even as much as perhaps half a pound or a pound a day or more of such a person may, within three or four days, be gotten entirely free from sugar and it can be done without almost absolute certainty. A good many cases whom we have treated here have shown a successful outcome in every single case. The patient can be gotten free from sugar in every case and the next interesting thing is the fact that the patient may be kept free from sugar and without danger of acidosis. Now acidosis is the serious thing about it, the accumulation of acids in the body which act as poisons to the brain and produce first drowsiness and then coma which carries off the diabetic patient. This new

method of treatment is based upon a new conception of the disease or rather a conception which is not entirely new but one which is supported by recently acquired laboratory facts which are of very great interest. Suppose you go into a cellar of the ordinary house. You will find foods of various sorts put away. Perhaps you go into a meat shop and you will find a ham hung up on one hook and a quarter of beef on another hook and a portion of beef in another place, and a piece of bacon in another place. The foods are hung up on hooks and some fowl perhaps hung up there. Without the hook the food would not stay in its place. Suppose that butchershop represents a body cell. Every single cell in the body has to be fed and the foods that we take in has to be somehow laid ahold of by the cell, captured by it, and made a part of it. Now the cell that has been discovered must have something with which to enable it to lay hold of the particles of food that are taken in and secure them, keep them. In other words, it has to have a hook on which to hang food, if you please. This substance which is used for the linking substance in the body is known as ambloceptor and it has been discovered that the pancreas manufactures the ambloceptor which enables us to capture and hold sugar. When sugar is taken into the body, if it is circulated in the blood as crystalline sugar it acts simply as a diuretic and does no good. Any kind of crystalline sugar put into the blood acts like a diuretic and is likely to be carried off through the kidneys and do no good but there are found in the blood two kinds of sugar what is known as colloid sugar and crystalline sugar as we find it in the sugar bowl and some of it will be found in the blood but there is also a colloid sugar which cannot be gotten into the crystalline form. This linking substance is made by the spleen. The spleen must link the substance for future cells with sugar and when a person has diabetes, in the first place, he loses his power to hold the sugar and the sugar simply escapes, passes off through the kidneys, and the next thing to lose is the power to assimilate and utilize fats and when that comes about he goes on rapidly to death. He can

get along very well as long as he can burn fats but, when he can no longer burn fats, after while he loses the power to link and hold the protein. Then he ~~six~~ goes into ~~coma~~ and dies. If a person in ordinary health stops eating in a short time there will be found accumulating in his body, in the urine, abnormal acids. The body has attacked itself and the human flesh is not a good diet for the body. When a person is fasting he is not really going without food but he is simply eating himself, gnawing his own bones, so to speak. That is the situation of the fasting person. He is simply feeding upon himself and when a person feeds upon himself, under ordinary circumstances, there are produced these acids: betaoxybutyric acid, or diacetic acid, ^{poisonous} substances which poison the brain and nerves and produce mischief. A person in advanced diabetes is in this condition and he is producing these acids all the time. That is where the danger is. It is not from the sugar but from the acids. Now there has been a great mistake made in dealing with diabetic patients. The first was the idea which was formerly prevalent, that a person who had diabetes suffered from sugar in the urine and could not utilize sugar so he had to take all the starch out of his diet and the result of taking out all the starch was that this patient lived his life upon a starch-free diet and got acidosis and a great many people were actually killed by having starch of all kinds taken away and being compelled to live on a diet of fat meats, butter, and meats of various sorts almost exclusively. It was found first by experiments published by Mosse in France who called attention to this some years ago that patients did better on a diet of potatoes than on a diet of beefsteak. It has been found that in the diabetic the opposite of this is true, that when a person has diabetes if food of all kinds is withheld, he takes no food of any kind, that the acidosis disappears. The sugar disappears and the acidosis disappears. Physicians were refrained from making the attempt to let a diabetic patient fast for a long time for years and years until quite recently, until three or four years ago when Dr. Guelpa of Paris made the interesting discovery that a patient suffering from diabetes could fast without producing acidosis but that the very opposite result

was found, that acidosis would disappear and the sugar would disappear. Another interesting thing that has been discovered, pointed out by VenNoorden, was that animal protein is bad for diabetics, that meat is particularly bad and that vegetable protein can be utilized and taken in larger quantity and without the same bad effects that follow the use of animal protein so at the present time a method has been developed as the result of these various investigations that have been made, some of them at the Rockefeller Institute in this country where Dr. Allen has devoted himself to the study of this question for several years, and we have been carrying on some researches here and putting all these interesting facts together have finally formulated a plan for treating patients suffering from diabetes and we have very, very great hopes and are even now seeing certainly most wonderful results. The plan has been adopted and a complete success has been obtained in every single case without a single failure in getting entirely rid of the sugar and I believe we shall succeed in every case. I do not mean to say that every case will be entirely cured. That is quite another question but the thing is to control the sugar and that is very necessary because the sugar makes sugar. The more sugar there is circulating in the blood the more sugar the body will produce so it is highly important to clear the urine from sugar and get rid of the surplus sugar in the blood. The method is this. The patient is first asked to fast. A fast does not mean that he does not eat anything but only that he must not eat anything that has food value. He may have all the Colax, for instance, that he wants, special Colax without any sugar in it, agar-agar, he can use in the form of jelly and he may have bouillon all he wants, not meat bouillon but vegetable bouillon, savora broth. He may take as much as he pleases and he may take Minute Brew or some cereal preparation or some caramel preparation of some- any sort. He may take as much as he likes but he must not eat any ordinary food, must not eat starch, protein nor fat for one, two or three days or longer if necessary. Each morning an examination will be made of the renal secretion, the urine, and if sugar is found then he must ^{fast} ~~fast~~ another day and when the urine

is found free from sugar then he fasts still one more day and the next day he begins on a diet of green vegetables. He begins with a small amount of green vegetables, say half a pound of green vegetables, but that would not mean potatoes nor beets because they contain too much starch or sugar nor even turnips but it means asparagus, beet tops, turnip tops, dandelion greens, lettuce, cabbage, and things of that sort and Jerusalem artichokes along with the rest, and he may eat half a pound, the next day a pound, the next day a pound and a half and the next day two pounds. Then he may change his diet and take a diet of protein and fat. He will take that along with his green vegetables. He will take gluten bread, for example, from which all starch has been removed and with butter and will rapidly increase the amount, 100 calories of protein with two or three hundred calories of fat and rapidly increase it up to ten or twelve or fourteen hundred calories and two hundred calories of protein but keeping the protein always low. Then after a few days he will begin to add carbohydrate, perhaps fifty calories, then 100 calories and so gradually creeping up until he ~~has~~ is able to take two or three or four or five hundred calories but the diabetic patient must always keep the ration low. He must live on the smallest amount of food he can live on. That is very necessary. He must never take any excess of food because the excess of food is the worst thing possible for him and an excess of protein is as bad as an excess of starch and maybe even worse. The urine is watched constantly and if the sugar appears, then there must be another day of fasting and it is found to be advantageous for the diabetic to fast a day every two or three weeks or at least once a month. In that way this disease can be kept under control and the progress which it naturally makes can be arrested. I will be able to tell you more about this at another time, perhaps.

Q. What takes place when there is a rise of temperature?

A. The same thing takes place that takes place in a fire when the heat increases in the room. If you have a fire that burns the fire burns more brightly when there is more oxygen and there is more fuel consumed. Now there is a fire burning in the body and when there is a rise of temperature there is more rapid consumption of tissue than there ought to be and that is why the temperature rises.

Q. Is a floating kidney considered dangerous?

A. No, not usually. Sometimes it is so low down that it makes a kink in the ureter, a little tube which connected with the kidney and runs down to the bladder. When the kidney falls over and makes a kink in this tube then the urine will accumulate and the kidneys will become enormously swollen, distended and what is known as Dietl's crisis will be produced. The patient will suffer greatly and the kidneys may become cystic.

Q. What is the cure for obesity.

A. Less dinner and more hard work. However, there are two kinds of obesity. There is a sort of obesity due to a diseased state of the internal glands, the glands of internal secretion. These glands become diseased in a certain way and the result is obesity comes because the metabolism of the body is reduced. The fires of the body do not burn fast enough. When the fires of the body burn ^{too} fast enough we have fever. When the fires do not burn fast enough we have obesity, have an accumulation of fuel. For the ordinary case of obesity this is due to the taking of more food than one needs and the cure is to eat less food and do more work. The great trouble is to get the person suffering from obesity to exercise enough so we now have what we call an automatic exercise machine in which a patient can sit in a chair and read a newspaper, have an easy time, and have the exercise taken by electricity. The electrodes are applied to the abdomen and back, ^{the} muscles of the thigh and the parts that are most fleshy. Then the machine is set going and the patient works. We can make a person walk three miles in twenty minutes at a very lively gait and the person does the same amount of work

in that twenty or thirty minutes that he would in a walk of three miles. In fact, we can make him walk faster than that by speeding up the apparatus and the perspiration will just pour off the body during this exercise without there being any feeling of effort whatever. I saw a gentleman the other day perspiring very profusely and found he had lost two pounds in thirty minutes with the automatic exercise apparatus. Another advantage with this apparatus is that you can apply the work wherever you want it. If it is the abdominal region where the excess of fat has accumulated, then we apply the electricity to this point. If it is some other place, it is applied at that point so the work is concentrated. A lady asked me one day, "Why is it I have such an enormous accumulation of fat around this part of my body and my arms are not fat, nor my hands and my feet and the cushions of my legs are not fat but it all accumulates around here? Why is it?" "Well", I said, "It seems to be plain enough. Your legs are not fat because they have so much hard work to do in carrying around such a surplus amount of fat and your hands are not fat because they have so much work to do, don't you see, at the dinner table. They work so hard carrying food to the mouth it keeps the fat used up." She said, "You are entirely mistaken. I do not eat half as much as most people do. I am a very small eater, indeed." Persons who suffer from over-eating are always sure that they are very small eaters and it is very hard to convince them of the necessity of curtailing the ration some times.

Q. What causes difficult breathing or shortness of breath in one who has no organic heart trouble.

A. It may be an extra accumulation of fat around the heart. It may be the blood is impoverished. In a person whose blood vessels are diminished there is shortness of breath just the same as in a person whose breathing apparatus is interfered with or his heart affected. It is possible it might be due also to a form of asthma that comes from auto-intoxication.

Q. Is infantile paralysis contagious.

A. Yes from the nasal discharges, probably through some parasite,

also some carrier.

Q. If high heels are hygienic, sensible or comfortable for ladies why do not men wear them.

A. Well, I suppose men have not the same aspirations the ladies have. I believe the ladies wear high heels so they will look a little taller than they are. They think they are too short and they do not like to be looked down upon. They are endeavoring to get up in the world. The high heels are certainly objectionable. It does not deceive anybody. It is very easy to subtract the heel when you are forming an estimate of a person's height and the high heel does do a great deal of damage in throwing the body out of balance and throwing the whole weight up on the toes. After while the instep breaks down and the person becomes a chronic sufferer from rheumatism in the feet or ankles or rheumatic pains and it throws the body out of balance in other ways so there is an extra strain brought upon the muscles of the back. It might not do any serious internal injury but certainly it will be a source of pain and nervous irritability.

Q. What is catarrhal appendicitis.

A. It is a mild form of infection of the appendix. It is simply an extension of colitis or catarrh of the colon from the colon into the appendix.

Q. Does the X-ray for goitre destroy the thyroid gland?

A. It destroys part of the thyroid gland, it destroys the abnormal growth of the gland but the normal part of the gland is not injured unless the application is repeated too many times or applied with too great intensity.

Q. What is the cause of cough and expectoration?

A. Probably bronchial catarrh which generally means low vital resistance and that means usually a stagnant colon. That is the great source of lowered vital resistance. The body is overwhelmed with poisons and its resistance is damaged and weakened by the excessive demands upon it.

Q. Is the sinusoidal form of electricity bad for the heart?

A. No, it is not in any way injurious to the heart. It may be applied as a general tonic or as a mode of exercise. It is useful in both ways.

Q. Is it true that an abdominal operation shortens one's life a number of years?

A. I have known quite a number of lives to be greatly extended by an abdominal operation, and on an average I should say that an abdominal operation extended life, otherwise it would not be worth while to perform the operation. There is no particular reason for supposing that the abdominal operation shortens life or that a person who has had this operation may not live just as long as a person who has not had the operation, provided there are no other reasons in the way. It is possible, however, that the conditions which were present which made the abdominal operation a necessity may still exist to some extent in spite of the abdominal operation and may be the means of shortening life.

I thank you for your attention.

END.