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THE BEGINNINGS OF THE BATTLE CREEK IDEA.

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

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By,

J. H. Kellogg, M. D.

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I am going to tell you a little tonight of the history of the Battle Creek Idea. The Battle Creek idea did not originate in Battle Creek. The Battle Creek idea is really a very old thing. It was not discovered in Battle Creek; it is not a modern thing; it was a very old fashioned idea that has come down from the ages, from the most remote times, from pre-historic times. There is evidence that the bath, which furnishes the basis of modern physiologic therapeutics, has been known from the very earliest ages, and probably was employed by prehistoric man, because we know that animals employ the bath; the elephant takes a fine shower bath, he takes a douche bath. Some of you have seen the elephant watering himself, spurting the water all over his back on a warm day, and animals of all classes enjoy the bath. I had a very forcible illustration of this some years ago when I was out on the Pacific Coast at San Diego; I was over on the island one morning, and went out to ~~see~~ take a sea bath, and passed by the monkey house which they have out there, and it was a ~~xxx~~ pretty cold morning. The temperature was down pretty nearly to freezing that morning--rather unusually cold, and I noticed the mother monkey in the cage with three small monkeys; the mother monkey was standing guard over some green guavas that had been put into the cage. Two of the little monkeys were sporting about, trying to steal some of the guavas, each one of them watching his chances, one in front and the other behind, and they took advantage of the old lady several times, and she cuffed their ears. One little fellow had evidently swallowed some of these green guavas and had begun to suffer the consequences, which was a warning to the

mother; and she was endeavoring to protect the other members of her family from like suffering. The poor little fellow with a very long, melancholy face, in mourning, climbed up the side of the cage and was looking over the hot water pipe, taking a fomentation to his stomach. Now, the little fellow did not have to visit a Sanitarium to have that fomentation, to find out that fomentations are good for the stomachache. He had discovered for himself the properties of it; his mother had taught him that the hot fomentation, or hot water, was good to relieve pain. There are other reasons for believing that water has been used, that heat has been employed as a therapeutic means, a means of relieving distress and pain from the earliest ages. When a dog gets the earache, he puts his paw on his ear, doesn't he? And when a baby gets an earache, it puts its hand up to its ear just the same as the dog does. The dog and the baby have the same things. When the dog has pain in his stomach, he curls up, gets his head and heels just as near together as he can. A boy with the stomachache does the very same thing. The purpose of this curling up is to retain the heat about this part of the body, to increase the heat about the stomach to keep it warm. If you get a toothache, you put your hand on your tooth involuntarily to warm your tooth. These are simply instinctive means by which we apply therapeutic measures,--the heat of the hand, for example. So as I say, this idea of the natural means of cure is a very old one that reaches away back into prehistoric times. I am going to show you, however, tonight, some of the beginnings of scientific hydrotherapy.

One hundred years ago there was a peasant boy living away up among the hills of Austrian Silesia, at Graafenburg. Here is the way he looked when he was grown up. His name was Vincens Priessnitz. One morning a man came along through that village who was a traveling locksmith. In those days they didn't have enough of that kind of work to do to have a locksmith in every village, so the locksmiths traveled from village to village. So in this mountain hamlet

this locksmith came along, and it seems he was something of a sorcerer as well as a locksmith; so while he was repairing the locks, he heard them talking about a cow that had cut the cords in one of her hind legs by backing up against a sharp sickle. He heard them talking about it, so in the morning he suggested that he could cure it; that he had certain magic words by which he was able to cure such injuries as that. So the next morning he was allowed to go out to the pasture where the cow was, but he wouldn't allow anybody to go with him except this small boy who was then about fourteen years old. As the little boy was going out with this sorcerer to attend to this cow, the grandfather said to him, "Now, little Vincens, watch sharp, listen, and hear just what he says." So when he came back he made a report, and the report was that the sorcerer sat down by the cow, and crossed two sticks over the wounded leg, and then he repeated a number of magic words, that he repeated back and forth several times; then he took a linen cloth which he had, wet it with water, bound it around the wounded leg, and he gave instruction that this cloth should be taken off and rewet and put on again three times a day. He went on his way, and when he came back again in a couple of weeks, the cow was well. The people were so very much pleased with the recovery of the cow that they said to the magician when he came back, the sorcerer, "Now, we will pay you a handsome sum if you will teach us the words." So he taught the words to little Vincens, and he became a sorcerer; and that was the beginning of the water cure. He went on for a number of years practicing magic along with the water cure, and by and by instead of using a wet cloth, he used a sponge, and he was known throughout that whole country, a very primitive region, as the doctor of the magic word. That was what he was called,--the doctor of the magic word; because he repeated these magic words whenever he applied the water to the parts that were sick. Sick animals were brought to him; sick people came to him, and he prospered very greatly.

Twelve or thirteen years ago I made a pilgrimage to this spot. It is away off on the Austrian frontier, close to the border of Russia, so that you can look over into Russia from the top of these hills here. The houses are built of stone and cement, are very substantial houses, but very simple. I saw the room in which Vincens Priessnitz was born 120 years ago. The house in which he lived is still standing. At the time he was a child, the family lived upstairs, and the cattle downstairs, which is the custom in that country still, in many parts, as also in many parts of Switzerland, as some of you ~~xxx~~ who have traveled in Switzerland doubtless have seen. That is a very common arrangement in that country. One day, some little time after this had happened, Priessenitz went out into the woods, and he saw a deer that had been wounded by the hunters, and this deer came every day to put its wounded leg down into the water of the cold spring so he acquired the idea that the spring must have some particular healing virtue, because the deer had put his foot in it; so he constructed a trough, an open trough of logs to carry this water down some little distance, and there it was used for the healing of people, as I will show you in a short time.

Here is a picture of the boy, Vincens Priessenitz, going to the mill. The horse ran away and through him out, and the wagon ran over him and crushed his ribs. The doctor said he could not live; but he had already gotten this idea of the healing power of water, and the magic word, and he had compresses of cloth laid upon his chest, and the result was that in a few weeks he was well, and the noise of his cure and of the cures of sick animals went out throughout the whole country, and great numbers of people began to gather in, in a little while.

Here he was hauling logs down the mountain side one day, and the horse ran away again, and he was run over and an arm was crushed, and he was very greatly hurt. He applied the water again, and was speedily cured. Animals were brought to him to be treated. You see him here treating a horse and a cow.

This cow has a moist abdominal bandage, you see. It did the cow just as much good as it does some of you. They also recovered from torpid liver by the application of the umschlaag, as they call it there, or the moist abdominal bandage. These pictures you see here are illustrations of things that happened more than 100 years ago in the eastern border of Austria, just on the border of Russia. I have been over every spot you see here, and traveled allthrough the mountains and woods of that country, which was very interesting to me, and really a very picturesque country. As you will see soon, some of those springs have been very much decorated and ornamented since. Here are some sick people coming to Priessnitz to be cured. You see large pitchers here made of pine wood, and the water was put into these, and they soaked their arms or feet, and had their bandages wrapped about them, and in this way applied the water cure.

Here is where the water from the spring was brought down and poured out through a hollow trough. I saw the very place where this stream fell down; and this was several miles from the home where he lived, away out in the mountains; the people traveled out there to get the treatment, and often in midwinter they went out, took the treatment as you see it being given with the ice cold water pouring down. Their methods were very crude, and I am going to show you in a series of pictures the methods of water cure that Priessnitz found in use among the peasants of Austria and various wild parts of the country in the remote regions of the mountains. Here are some of the methods that were in use and are still in use. When I was there, I stayed over night in one of the little hotels in that very place where Priessnitz formerly practiced this water cure method in the institution which he erected, and toward morning I heard a loud rumbling that sounded like thunder and I thought it was thunder, and it seemed to come nearer and nearer until by and by it stopped just in front of my door, and I looked out to see what was the cause of all this roaring and thundering that had been going on for several minutes, and I discovered it was one of

these bath tubs on wooden wheels which had been trundling down the hall. The building is made of cement so it is quite sonorous and the noise would resound through the halls. This tub had been filled from a spigot at the end of the hall, and then had been trundled all the way down the hall to give a bath to the person occupying the room just across the hall from me. The patient was put into the water cold as it comes straight from the mountain springs, at the temperature of about 45°; but before the cold bath the patient has already had some treatment applied; he has been wrapped up in a wet sheet wrung out of cold water, then with woolen blankets, and over all a feather bed had been placed; and he had been lying there under that feather bed sweating profusely for an hour; and in the old days the patients down in the first story complained about the rain coming down from above--the perspiration poured down so abundantly that it filtered down through the cracks in the floor; at least that is what the patients said, and a circumstance is recorded in which there was a bitter complaint made.

Now, from the little beginning I have told you about, in the ~~former~~ course of forty or fifty years, there grew up this great institution which you see here, and there is quite a large village now about the place, quite a large town, a town of perhaps twelve or fifteen hundred inhabitants, and several institutions, four or five quite large institutions growing up about it; and just over on the other side of the mountain there is another institution that originated about the same time, in ~~which~~ which a man applied the very opposite methods. Instead of giving patients a great deal of water, water upon the outside and water upon the inside, he starved his patients. This was the beginning of the fasting cure you hear about still nowadays; it is still a fad, a sort of renaissance of the old fasting fad that originated 120 years ago. A man by the name of Schott conceived the idea of doing the very opposite of what Priesnitz did. Priesnitz gave his patients ten or twenty or thirty or forty glasses of water a day. That ~~amount~~ amount seemed to be very extraordinary, but a lady in Chicago

said her doctor prescribed for her not less than one gallon of water every day to drink. She is an old patient of ours, and she wanted to know whether it would be safe to do it. She was afraid she might drown or something, but I wrote her back it was perfectly safe provided she didn't drink Chicago water. If she was careful that the water was clean, it would be all right; but I doubt whether it would be safe for her to take so much food as would be communicated by Chicago water. A man by the name of Schott, living over across the mountain, put his patients to bed sometimes for ~~an~~ week with absolutely not one drop of water, for two or three days in succession, and buried them up in feather beds, made them sweat too so they would want the water all the more, and he also made them abstain from food sometimes, or just a small crust of bread once in a while. It was total abstinence from food for one or two weeks, and from water for three or four days. This ~~he~~^I said, was the beginning of the fasting cure. His patients got better afterwards when they began to eat, but it was the sameway in which a person gets better after a course of typhoid fever. He comes up rapidly. You know the darkey said it was really nice to burn his toe because he felt so much better when he got well. So with fasting, if one survives he feels pretty well when he gets over it.

Here you see another picture of this same bath tub here, and the patient getting cold water in the tub, and poured upon his back at the same time. He looks rather poor here. I tried one of these cold baths myself, and I assure you I was very glad to survive. I stood it for three minutes, and concluded I had had enough to know what it felt like.

This shows the very beginning of this water cure here which began with Priessnitz in such a curious way. Here is the boy Priessnitz, a boy of fifteen or sixteen, who is treating the poor people upon the benches. These pictures were prepared something like sixty years ago by people who were eye witnesses of the scene, and they put them on record. I obtained them from Graafenburg,

on the occasion of my visit there about fifteen years ago. You see it was nearly one hundred years ago this was taking place. The first beginning of the water cure was 1816, 1817, almost 100 years ago. The work really begun some years before that. Here is the wet sheet pack. This man Priessnitz, peasant that he was, without any education--did not know how to write his name even till he was forty years of age, could barely read in the modern way, never wrote a book, left nothing behind him in the way of writing of any sort with reference to his views or theories, and we know nothing except what was learned incidentally by those who visited his place,--this man originated almost every single process that is employed in the water cure methods. I think, aside from some of the methods that have been originated here in this institution within the last forty years, I think this man originated almost everything that was known. His methods however related almost entirely to cold water applications. Quite a number of warm water and hot water methods have been developed here in this institution, but the cold water method was developed by Priessnitz; and that is the reason why this method of using water was first known as the cold water cure. When I was a boy it was the cold water cure. The institutions were known as cold water cures, and there were a good many in this country that were scattered all about the country from Maine even down to Ohio. The old Cleveland water cure presided over by a Dr. Seely was very popular forty or fifty years ago, and it was still quite successful, quite prosperous when I took charge of this institution thirty-five years ago. I remember about it very well, and we had a few patients from there.

Here is a patient who is wrapped up in a wet sheet, rubbed, then more cold water put on, and then rubbed again till he is warm, then some more cold water put on and then rubbed again until he was warm; so the process was continued until the patient had as much as his strength would permit him to bear. After the patient had had a rubbing of that sort, then he was wrapped up in a cold sheet

and put into bed with blankets around him.

You see here this man's wife is having a sitzbath, wrapped up in a tub, and she was supposed to continue the bath from one to three hours usually and when the water got warm it was changed and more cold water put in. The temperature of the water was never above 60°, and usually was 50° or 55°. Here are some of the wooden pitchers out of which the water was poured upon various parts of the body. When a man had gout, he had the cold water poured on his foot for ten hours in succession. The attendant would rub the foot occasionally, and the result was that acute attacks of gout were usually stopped, they were arrested, and the pouring and rubbing was continued until the process was controlled. Here is a sprained joint; this man is suffering from headache; this man has a dyspepsia, or a torpid liver, and cold water, as cold as it came from the mountain spring, was poured sometimes from a height of several feet. After these baths were over, wet jackets and bandages were applied. Here is a jacket, a flannel vest, and this is dry, and this part is moist. It was passed through a loop so that when a man put the jacket on these applications would come just where they were wanted. This covers the back, and this goes on over the stomach. When this folds over, it lies over this and keeps it warm. It is a very ingenious arrangement, indeed, by which the patient could apply his bandages himself.

Priessnitz believed in exercise as well. Here are dumbbells and Indian clubs in use 100 years ago. These appliances we think are so modern, and the methods we employ of swinging clubs, and exercises with bells,--these very same methods were employed by this peasant boy away out in Austrian Silesia almost 100 years ago. It is strange how long it takes a good idea to penetrate the obtuse consciousness of the general public isn't it? Just think of it--100 years we have been getting hold of these ideas, and are only beginning to grasp them now. Every town ought to have a sanitarium; every town ought to have all these facilities; every city where intelligent, civilized people live ought to have the

advantages we present here in this institution. The purpose of this institution is not to make money; it is not a commercial enterprise, as I suppose you all know; it is an altruistic institution. We do not pay taxes. That is the best proof we can give that this institution is not a profit-making institution,--is that the State of Michigan exempts this institution from taxation; because nobody has any share from any earnings there are. Whatever profits there are go to the improvement of the institution and the diffusion of a knowledge of the principles of the institution. This lady is taking her exercise. She would not go outdoors to saw wood, because she was a lady of high standing. She was the wife of a braon or a lord or somebody. This place became very popular with great people and wealthy people. They traveled to Priessnitz from all over the world for treatment, after a few years, his success was so remarkable. This lady is taking the exercise in her bed room, sawing wood, and here is a page come in to introduce some early visitor who is calling upon her. Here is a man sitting on the edge of his bed sawing wood. Priessnitz believed in gymnastics, in the outdoor gymnasium, and in the open air. Here are patients going out with an ox team into the woods to take that douche I showed you a little while ago. They had a ride five or six miles to go to the douche in the woods. He hadn't then got money enough to bring the water down to the institution, to the village, so his patients had to ride out to it; and in winter time they had to go through the snow. This is the snow bank they are riding through. They would turn out in great numbers and shovel paths through the snow which falls there sometimes to a depth of ~~xxxxx~~ eight or ten feet.

Here is another lady going out, and here is a man that is just coming back. He has been out to take a drink of water at the spring. They had to tramp out in the morning for eight or nine miles until their cold bandages had been warmed up and dried out; then they might go home and get some breakfast, and they had to drink six or eight or ten glasses of water on the road; so you see

they had quite a task to evaporate all that water.

Here is Priessnitz himself out for a morning walk among his patients. He is stopping to have a little chat with the people. He ~~did~~ not know anything ~~of~~ medicine, and hardly knew the names of the internal viscera. He absolutely knew nothing at all about scientific medicine, but he was entirely empirical,; but he had gotten hold of a great principle of cure, and his ingenuity was something extraordinary. I really feel the man must have been inspired to have developed such a marvelous number of practical ideas with reference to the use of water, and gathered from the peasant people, the simple country people, gathered these ~~the~~ methods up and brought them together and organized them into a system--the methods which had been in use among those mountaineers for centuries.

Here is a douche. That was elaborated later when he became a little more scientific in his methods. They had the great douche and the small douche.. The great douche was fifteen feet in height, and the stream of water was the size of a man's arm. The smaller douche was nine feet, and the ~~xxxxxxxxxx~~ diameter of the stream was about an inch. The large douche was too heavy for some people, so it was necessary to have supports to keep them from being washed away. Here they are out for water drinking in 1845. That is the sort of sight you could see in those mountain paths every morning in the year 1845. Here is the style of dress that was worn in those days, and here is the spring. The spring has been brought up now through a little fountain that has been erected by a grateful patient from Poland, and there are now a dozen or more of these springs that have been erected by grateful patients who were cured by the simple methods of this peasant doctor. This is showing how the wet bandages were applied. I do not suppose there is any nurse in the institution here who could apply a bandage with greater skill than the bandage which you see there. We had with us some years ago a very interesting gentleman, Mr. Prang, of Boston, the founder of the Prang Lithographing Company, who did so much for ~~the~~

lithography as an art in this country. Mr. Prang was often a patient with us here. He came here many years ago, and I found the reason he came was he had been when a boy a patient with Priessnitz, and was acquainted with priessnitz,-- this man I have been telling you about. He was a German, born in Germany, and his parents took him when he was a boy of thirteen or fourteen and was very sick and weazened, they took him to Graafenburg to be treated by this peasant doctor I have been telling you about; and he gave us many interesting accounts of his experience there. He told me some of the interesting things I have been telling you with reference to the place, and was rescued himself from an early grave. He was going down rapidly, and his friends believed he would die shortly, but he got a good start and was over eighty years of age when he died, only two or three years ago. He had lived a very active life, and was straight as an arrow, healthy, vigorous in appearance up to a short time before his death. Priessnitz was out visiting his patients, and he had to visit patients over many miles of country, and traveled over to some of the adjoining hamlets. Here you see a different kind of bath, carried to the patient's room; and here is the patient in the pack with a feather bed on top, ~~xxxxxxxx~~ This is the way the first sanitarium looked on the inside. It was not really a sanitarium, because it was only a water cure. That is the way the houses look. They were built of logs, and the spaces between filled in with mortar so they were very warm and comfortable; but the furniture was all very simple and primitive, and the furniture is almost as primitive to this day. The same simple bedsteads and feather beds for covers, and the same wooden pitchers are to be seen in use in these establishments in Graafenburg at the present moment. A thousand or 1500 people visit this place every summer, and it is open part of the time in winter.

Here are views of the chest compress, the spinal compress, the hand compress, the foot compress for a patient suffering from gout, or with a sprained ankle. This is the ingenious method Priessnitz adopted for a ~~xxxxxxxx~~ refractory

boy. He had the boy riding on a hobby horse, and then would slip up with a pailful of cold water and give the boy a cold douche. Of course the boy is surprised; nevertheless he is happy when the reaction comes on a few minutes later.

Here is a picture of Priessnitz and his wife from paintings prepared of them in their simple costumes as they appeared about their work 75 or 80 years ago. This was the water cure in 1857, and the patients out taking their morning cups. Here is another fountain that has been put up by a grateful patient. This shows the style of dress the German ladies wore away back in 1857. Here is the douche again. Finally, when the water was brought down from the mountains to the old house where the work began, they had this little yard built around for a little room for protection, and here is a man taking a douche to his ~~hand~~ foot. He was suffering from gout in the great toe, ~~xxxx~~ and has the water falling upon that part of the foot. Here is the eye douche, here is the wooden fountain carrying the water down so that it falls upon the man's eye. This is the eye douche. Our apparatus at the present time would be more convenient, but not in any respect more effective. Here is a drunken man. The usual method of treating him was with this enormous syringe. A stream of cold water was applied to the stomach with the effect to induce vomiting, so the liquor would be expelled. When the douche was not at hand, a little stool of some sort with a pitcher full of water served the purpose just as well. It is astonishing what cold water will do for a drunken man, how it will revive him. I had an experience like this some years ago in Chicago. For seven years, I spent every Sunday of my life in Chicago working in the slums. I started a little mission in Customhouse place, and we used to have 200 or 300 men a day sometimes, especially after the World's fair, in hard times, when we would have more than that. I remember one day I happened to be in the mission and a fellow came in dragging another man down the steps. The man was so drunk he was fighting him, and he was having a hard time to get him in, but he came dragging him down the steps, got him into the bathroom,

and he shouted out, "Where's the man what sobers 'em up?" He wanted some one to sober up this friend of his. He had been there a few days before in the same condition, and he was gotten into a shower bath, and when the cold water fell upon him, in about fifteen seconds he sprang out of the aisle, and he says, "You have wrought a miracle", He says, "I am a sober man", and sure enough he was. In half a minute he had been transformed from an intoxicated man that didn't know anything at all what he was about to perfect sobriety. You have heard sometimes of drunken sailors falling overboard and becoming sober the minute they struck the water. I didn't really believe that story until I saw the thing happen.

Priessnitz was the man who discovered this. I should not have known enough to have known that if I had not learned this from Priessnitz--that the cold water application has the power somehow to overcome or antidote almost instantly the effects of liquor. We got quite a reputation, and our place was very popular on Saturday nights. Along toward morning on Sunday nights, a great number of fellows who had been on a spree all day Sunday would come in about three o'clock Monday morning, to get sobered up so they could go to work. That was a very common experience,--to have 150 or 200 men coming in there to be helped out with the hope that they would be influenced to reform. We succeeded not infrequently in getting them interested, so they would come back and give us an opportunity to labor with them and persuade them to lead better lives, and some of those men today are clergymen. Some twelve or fifteen men who came in through that door in the slums are now clergymen, Presbyterian, Baptist, and Methodist clergyman. And one man who came ~~into~~ that place is at the present time in charge of a large work in New York City. I received a newspaper clipping not long ago announcing that the Presbyterian synod of New York had just held a meeting and had unanimously ~~passed~~ voted to receive him as a clergyman in their synod, and to put him in charge of this work, in New York City, which was pretty

good evidence that the application of this cold water paid, for it was the cold water that did it; it was simply the miracles, apparent miracles that are wrought in sobering up these intoxicated men, and helping them to become interested in what was going on, and to become better acquainted with better ways.

Here is another way in which Priessnitz exercised his patients and gave them some more exercise. He had a wood pile out behind the barn, and he had his patients saw his wood so it didn't cost him anything to get his wood sawed. He had to burn wood, and he had a great number of patients who were too poor to pay for their treatment, and some of them worked on the farm and sawed wood for him, some shoveled snow, and most of them had something of this sort to do. He began his work without making any charge at all. For years he gave his patients treatment absolutely free; then he made a small charge, and today the charge is ridiculously small. I suppose some of you will be starting for Graafenburg right away; but a person there gets board for about five or six dollars a week; then he pays his doctor six shillings or so a week for looking after him, then he pays his masseur or bath attendant anywhere from fifty to seventy-five cents for waiting on him, to give him his baths, not for each one, but anywhere from fifty cents to ten shillings a week for his attention; so a person can get everything possible for this place to give him for about ten or twelve dollars a week, or even less; but of course, that is only water. One bath a day, walking out in the woods, and very plain living. It is a place somewhat difficult of access, yet with the most beautiful scenery; and even in those days, one hundred years ago, when there was no steam transportation on the ocean and none on land, men used to travel, wealthy merchants would travel all the way from Rio Janiero in South America,--all the way across the Atlantic, take a long stage journey clear to this frontier town in Austria in order to consult this peasant doctor who didn't know the first thing about the names of the diseases even, but knew how to show sick people the way to health, for people got

well there ordinarily who died elsewhere; and the people that came to him were people who had tried everything else in vain, and after while so great an interest was created that various European governments sent their best physicians to Graafenburg to study the methods of Priessnitz. For instance, France sent their surgeon-general, of their army, to Graafenburg to learn the use of water, and it was adopted into the French army and used by Napoleon, by the physicians who followed Napoleon in his campaigns--water was used in the treatment of wounded soldiers. Wet compresses were applied instead of the barbarous methods that had been employed before, and that was really the beginning of modern surgery,--the successful treatment of wounds by the substitution of cloths wet in water instead of cloths wet in irritating and polluting linaments of various sorts that had formerly been applied.

Here is the wet bandage. You noticed how several people went out a few moments ago to go and get their wet bandages, and the hour has come for it, and the same thing happened in Priessnitz' time. Every single patient had to have his wet bandage applied at night. We do not use it as a routine, but I suppose ten or fifteen per cent of our people have applied these same moist bandages that were applied by Priessnitz 100 years ago. I did not originate this ~~xxxxxxx~~ method, and I do not know where it did originate, but it was a method employed by the mountaineers of Austrian Silesia a century ago, and it was found to be advantageous. Every morning, after taking the wet sheep pack, and sweating until the bed clothes were well saturated, the patient was led down to this plunge. The temperature of this one was about 68°; this is the moderate water, and this other water was naturally cold, with a temperature just above 32° in winter time, and about 45° in summer time. This man getting in thought the water was too cold, and he is begging to be let off, so he is offered the chance to enter the warmer water, which is 68°, if he likes. Here is the *umschlag*, or wet bandage, or Neptune's girdle, as it is called over there. This is quite familiar

to you all. It was simply a long piece of the coarsest sort of linen, about three yards long, wet at one end, sufficient to go once and a half times around the body, then the dry portion wrapped around the outside and pinned tight; that is all there was in it. This is one of the beautiful fountains that have been erected as a monument to Priessnitz by a grateful patient. I visited that very fountain and drank out of the spring a few years ago, so I know it is there. This is Graafenburg as it was in 1834, with some quite pretentious buildings. He had to build several buildings to accommodate his patients. The village has grown considerably since that time. Here was another fountain or spring where a monument has been erected to Priessnitz. People of different nationalities have clubbed together to build these monuments. Here they are out for their morning walk. One of them is barefooted, as you see, which was very common at that time. You have heard of the grass walking by the followers of Kneipp. Kneipp was a follower of Priessnitz. He obtained a book describing Priessnitz' methods, and introduced this method a few years after Priessnitz had had it in successful operation at Graafenburg. It is now known as Kneippism, whereas it is really nothing more than the old fashioned methods of Priessnitz who gathered the methods from the peasantry, and this procedure of going bare footed and walking in the grass originated with an Italian doctor who carried on his work in a small island in the Mediterranean off the Italian coast.

Here is another illustration of the wet bandages. In some cases they were applied to the whole body, to both legs as well as to the trunk. This was particularly so in cases of insomnia. Hundreds of times I have prescribed moist abdominal bandages to the legs for people who could not sleep, and with wonderful success. I remember very well a lady last year who suffered terribly from angina pectoris. She had not been sleeping for several years, and I ordered simply these wet towels applied to the legs, covered with dry flannels; and she went to sleep and slept as peacefully as a child, all night, and was entirely relieved

and for months the use of this simple remedy made her perfectly comfortable at night, so she was able to sleep well and without any pain from which she had formerly suffered so much. Here are some more simple bandages. Here is a patient just coming down from his morning sweat to take a dip in the cold bath, as you see, or the full bath as it was called at that time. This is another little village looking down from the mountain of Graafenburg, a little village down at the bottom where there is a church and some priests, and these priests were very much offended because ~~xxx~~ of the sorcery that was being carried on by this boy Vincens. He was perfectly innocent. He thought the magic words he was repeating had something to do with the use of water, because that was what he saw done by the man he followed, and he thought he must say those words, or some words, and he was arrested and taken down here, tried for sorcery; but he had by this time got to using a sponge instead of the sticks and a little cloth, so he was forbidden by the judge to make use of those magic words any longer; so he ceased to use the words, and he found the sponge cured people just as well without the words. So he came to be known as the doctor with the little sponge, and his fame went out all through that mountain country. Of course, the people were very illiterate, and it ~~was~~ very natural they should be more or less superstitious.

Here is the same thing--a bandage applied to the spine for spinal troubles, applied to the back for chest troubles, and various sorts of applications were made; and here is the grass walk, and patients out walking in the dew, you see, the ladies walking in their bare feet through the grass, and getting the strong reaction in the feet and legs which results from this procedure. And it is an excellent derivative method. Here is another illustration. Here is the cold douche, a strong dash of water being poured with great force upon various affected parts. Here is the air bath. These procedures are all copied from pictures which I obtained from Graafenburg a few years ago, to illus-

trate the completeness of the ~~xxxxxxxx~~ system developed by this illiterate man who had no teacher except Nature, who gathered together the various ideas which he found among the mountain people there, and made a practical application of it. Here is a group of some of the many different monuments which were erected to his memory after his death, by grateful patients. The most of them are fountains erected at the springs that were found through the mountains. It is a walk of nine or ten miles through the mountains to these different springs.

Here is where Priessnitz is buried. The people make pilgrimages there every year still. They have Priessnitz in grateful remembrance. Here is the log through which the water came down to fill the cold bath. The man is rubbed because the water is very cold, and it is necessary for him to be rubbed by two strong attendants in order to prevent him from becoming chilled.

Three or four years ago we had a visit here from a gray haired man who was a nurse under Priessnitz, perhaps ten years ago, who had worked for him, had been taught by him and was well acquainted with him as a young man, and was still a nurse traveling with a sick patient whom he brought here, though he was himself a gray haired man. Here is another of those baths on wheels. We fortunately have more convenient things nowa days, and are able to carry on our work in a more scientific way.

I am going to show you now a picture of some of the baths that are given here. Our instructor in Hydrotherapy, Dr. Roth, has been kind enough to execute these movements to show their application in a very skilful way, and we wo;; have the moving picture going in just a moment so you can see our method at the Battle Creek Sanitarium as it is carried on at the present time after our improved fashion. About the time of the death of Priessnitz, something like sixty years ago now, a young man was developig in Germany, just beginning the study of medicine, who proved to be of the greatest service in the advancement of hydrotherapy in a scientific way. I refer to Prof. Winternitz,--Prof. Wilhelm

Winternitz,--Dr. Winternitz, he is now, is a professor in the great Royal University of Vienna. When still a young man, just graduating in medicine, he went to Graafenburg. Priessnitz had recently died, but Dr. Winternitz had been an apprentice with him, had studied with him, and was a graduated physician when he was there, and Prof. Winternitz studied with the successor of Priessnitz, became acquainted with all these hydriatic methods; then went home to Vienna and made a scientific study of all these different methods of treatment. He applied scientific methods of testing the conditions of the patients under treatment, determining the effects by the thermometer, by means of the pulse and blood pressure instruments and various other devices, and so began what is now known as the system of scientific hydrotherapy. Scientific hydrotherapy really began with Winternitz. Prof. Winternitz, I am glad to say, is still alive. I think we have here in the house at the present time, and perhaps in this audience now, a lady, the wife of a New York physician, who is a regular patient of Winternitz, who has been in the habit of visiting him every year, a lady of German extraction, and acquainted with the reputation of Dr. Winternitz, has been in the habit of going over there every year to have some treatment from him; but the last time she went over there she made inquiry of Prof. Winternitz where she should get in America the same treatment she got from him, and he said to her, as she told me, ~~that~~ the other day, "There is only one place in America;" and sent her here. I have had the pleasure of being acquainted with Prof. Winternitz for more than twenty years, and have frequently visited him. When I visited his place at Kaltenleutgeben, near Vienna, a few years ago, I said to him, "Dr. Winternitz, what is new?" He said, "The only thing we have new is this:" and he took me into a side room and showed me our electric light bath, and he said, "this new thing is yours." He had adopted our electric light bath, and I saw only a head projecting out of the electric light bath, and he introduced me to that head, which was the head of Prince Hohenlohe, the first lord of the

treasury of the Empire of Germany. So you see what sort of patients he has. The next time I called on Prof. Winternitz, I said, "Prof. Winterätz, what is new?" He said, "Only colder water, colder water, colder water, always colder water; I follow Priessnitz." I thought you would like to know of this scientific man who has for his patients the most noble people of Germany and the wealthiest people of all Europe, the most popular physician in the use of water in the world, the most scientific man; yet this man was not all ashamed to say to me, "I follow Priessnitz." And who was Priessnitz? Simply this peasant boy of the Graafian hills of Austria.

So we see that great things do not always ~~come~~ go either with mighty callings, or mighty experiences. But Priessnitz himself was such a humble man, was a man of no learning at all, yet he seems to have been inspired. I think heaven must have sent him the knowledge he got, that he must have been inspired from a higher source. The time had come when the world needed just the light and the knowledge he introduced and that he had gathered up. He had a most remarkable mind, and great sagacity, and good sound judgment. The only examination he gave to the patient was to look at his skin. Every patient had to be examined carefully. He looked at his face, looked at his skin; and when he gave the patient his first wet sheet pack, he exposed the arm and looked at it to see what sort of reaction it had. If the patient had very poor reaction, didn't react well, he would have nothing more to do with him. Because he had learned that the patient who could not react well hadn't the vitality, the power, to withstand his treatment. The people of Europe, as I said to you a little while ago, the profession of Europe, even the kings and the governments of Europe, were so much attracted by the work of this man and the marvelous cures that were effected there that they visited the place from the very ends of the earth. The physicians of this country, the famous Benjamin Rush, the great Dr. Rush, of Philadelphia, one of the signers of the Declaration of Independence, was a follower

of Priessnitz. He adopted his methods in the treatment of yellow fever with very great success when it prevailed in Philadelphia, something more than 100 years ago, and so did various other doctors. A doctor in Portland, Maine, adopted the water cure methods, and his cures were so remarkable, there was such a commotion created that the doctors in the neighborhood of Graafenburg became very much alarmed; they were losing all their patients and were very much annoyed, and they made complaint against Priessnitz, and wished to have him imprisoned. They complained against him on account of his magic, but that was dropped and it could not be urged against him any more; so he was arrested for practicing medicine without a license, and the matter was brought to the attention of the Austrian government, and the Emperor of Austria, or the king, appointed a commission to go up there to Graafenburg and examine this man and see what he was doing. They came back and reported that he was not a charlatan, that he was not a quack; his cures were genuine; he was curing people that had been pronounced hopeless by physicians everywhere else, and he was doing a worthy work; so the government or parliament of Austria issued a special diploma and gave this man who had never entered a medical school, did not know an anatomical name, and gave him a special diploma to practice the water cure, to treat people by means of this new remedy, and to go on with his work; so he had the highest distinction of any physician in all Austria. Then physicians began to flock in there from all parts of the world. Physicians went over there from England and different parts of Germany; they became acquainted with his methods, introduced the water cures which have simply been following Priessnitz from that time to the present time. I am not at all ashamed to acknowledge the indebtedness of the whole world to this wonderful genius. I was going to show you some moving pictures tonight, but I see the apparatus is for some reason not ready for use, so I think we shall have to reserve that pleasure for next time. I thank you for your attention.

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LECTURE 29.

June 8, 1911.

Rhubarb and acid fruits I-5.

Oxalic acid of rhubarb, spinach 4,5.

Oxalic and uric acid poisoning 5,6,

Excess of cereals 6,7.

Acids, food I,6,7.

Potatoes 7,8.

" and leprosy 9.

" and obesity 9.

Potatoes aid to digestion -Saratoga chips-Pickled potatoes 10.

Tomatoes and cancer 9.

Home-made batteries-missionaries' 7,8,9.

Starchophobia II.

Digestion of starch of potato I2,I3,I4.

Stomach "Weeps for joy"-gastric juice I3.

Sour stomach-not sour potato-chewing I4.

Potato flour for babies I4.

" Experiments I4,I5.

Hyperacidity I6,I7.

Diabetes, salt in-Dropsy I7,I8.

Peanut oil-Olive oil I 8.

S.S.McClure-a rusty wire-Live wire-Dog's diet I8, 19,20.

Pepper and vinegar 21.

Granose and rice biscuit 22,23.

Raised bread-bread bullets, hoe cake 23,24.

LECTURE "(.29.

efficiency 18.

flesh eating 22.

hyperacidity 16.

meat 22.

oxalic acid 1.

pepper 20.

potato 3.

rhubarb 1

salt 17.

vinegar 20.

rhubarb 1
malic acid
late 3-
acidity 16
at 17
ciency 18
per 20
egars 20
at 22

QUESTION BOX LECTURE

At the Sanitarium Parlor, Battle Creek, Mich., Thursday, June 8, 1911, at 8 P.M.,

By,

J. H. Kellogg, M. D.

Question: Is rhubarb a good food?

Answer: No, it is not a proper food at all. Rhubarb can not be used in any way as a food, because the acid it contains is not a food acid. It contains oxalic acid, and oxalic acid is a poison and not a food. The food acids are malic acid, citric acid, and tartaric acid. Malic acid, the acid of apples, citric acid, the acid of lemons, tartaric acid, the acid of grapes--sour grapes--these are the food acids. Now, ~~ix~~ most of these acids, particularly malic acid and citric acid, are found in nearly all sour fruits. Tartaric acid is not so generally found. It is found in the grape, especially, but malic acid and ~~citric~~ citric acid are found in nearly all sour fruits. They are ~~often~~ often found even found in the potato, and in most vegetables they are found in some degree. Citric acid is found abundant in the tomato. When the tomato is well flavored and is acid, the acidity is due to citric acid. It was formerly supposed that the acid of the tomato was due to oxalic acid, and ~~was~~ under this mistaken notion the tomato was condemned as a food; but this was found to be a mistake. The acid of the tomato is citric acid, the same acid that we find in the lemon, only associated with different collateral flavors. Oxalic acid is not burned in the bog; it is not utilized as a food, but it is instead treated as a poison, is eliminated through the kidneys and has a very decided tendency to acidify the blood, ~~is~~ or to diminish the alkalinity of the blood. Now, if there is anything an invalid wants, it is better blood, and one of the finest qualities that the blood can have is a high degree of alkalinity; and this high degree of alkalinity is necessary for high resistance, it is necessary for active

Diet to page 16

oxidation processes in the body, for a high type of vitality and vigorous life, the blood must be highly alkaline. It is only in certain pathological conditions, diseased conditions as, for example, in cholera and in a state of the patient which is near to death that the blood ever becomes acid; but it may be more or less alkaline. The more alkaline it is the higher the vital resistance, and the greater the power to resist and to fight and to combat disease. Now, the acid fruits are highly valuable foods, not only because of the acids which they contain are food and nourish the body just as carbohydrates do, just as sugar does, and answer the very same purpose that sugar and starch do; but also for another very important reason. The acids of fruits and of acid vegetables, the vegetable fruits like the tomato are associated with alkaline substances which are very needful in the body in an organic form—soda and potash; not chemical soda and potash such as you find in the laboratory, but organic soda and potash, soda and potash that are in organic form, a form to be utilized and assimilated by the body; and these help to maintain the alkalinity of the blood which is an exceedingly important thing, especially in this country where meat is so largely eaten and where cereals are used to such a large extent.) (Meat contains a large amount of acid-forming substances, and when meat is used freely, the blood is likely to be very little alkaline. The acid elements of the blood are increased to a very abnormal degree, and the diminished alkalinity of the blood lowers vital resistance. That, I suppose, is the reason why the butcher is so likely to die of blood poisoning if he gets a little wound. There is no subject so bad for a surgeon as a butcher, no subject so bad as a large meat eater. Butchers and beer drinkers, brewers and saloon keepers, and men who take beer very largely are very, very bad subjects along with butchers. Butchers have so little resistance that very often if a butcher happens to cut himself with the knife with which he is cutting off steak for your breakfast, if he happens to cut himself, he will get blood poisoning and die in three or four days; it happens not infrequently. Butchers happen to cut themselves with the very knife with which they are cut-

ting off steak for your breakfast and contaminate themselves with the very meat you are going to swallow into your stomach, they get inoculated with infection and die with blood poisoning. It is only because the mucous membrane of the stomach and intestine is such a marvelous filter, for it is one of the most efficient filters that exists on the face of the earth--is the mucous membrane of the stomach and intestines--it is a marvelous filter; it has power to filter out poisons. Now, the best filter you can possibly buy in the market won't take poison out of the water; it will take sediment out, it will take out foreign particles, it will take germs out; but if there is poison there in solution, it can not take it out; but the mucous membrane of the stomach and intestine is a poison filter; so if the poisons are in solution, they can be taken out, they can be removed. Now, unfortunately, the mucous membrane can not remove all kinds of poisons, but the more common poisons, the most deadly poisons are filtered out--what are known as colloid poisons, poisons like the venom of the serpent can be easily removed, taken out by the mucous membrane; so if you get bitten by a rattlesnake, you can with perfect impunity, if there is no raw surface in your mouth, or in your stomach, you are sure there is none in your stomach,--you can with perfect impunity apply your mouth to that wound and suck the poison out of it; even though it should be swallowed into your stomach it would be absolutely no harm, because the mucous membrane has the power to filter it out, to exclude it; but crystalline poisons are not of this character.

There is another class of poisons which pass readily through the mucous membrane, and these poisons must be dealt with by the liver, kidneys, and anti-toxic glands. Now, what I am saying is true of the healthy person. A person who is suffering from parasites, who has tapeworm, who is suffering from thread worms or any other sort of internal parasite, a person who has gastritis or who has enteritis, who has a diseased, catarrhal condition of the stomach and intestines,--a person who is suffering from catarrh of the gall-bladder, or infection

of any part of the intestine--such a person can not take these poisons in this way with impunity because his filter is spoiled; his mucous membrane has been damaged so that these poisons can ~~na~~ pass readily through it. Oxalic acid is a poison which the mucous membrane can not exclude. It is a crystalline poison, so it has the power to pass through the mucous membrane and get into the blood, and for that reason it is a very unwholesome thing. Rhubarb absolutely should be prohibited from the human diet. It is absolutely unfit to go into any human body because there is no protection against it. The poison goes right into the blood. Now, you all know what oxalic acid is. If you get an ink stain on the carpet maybe you will get some oxalic acid to take it out. If you get your hands stained with some sort of vegetable coloring matter, oxalic acid is a very good thing to remove these stains from the hands. It is an excellent bleaching agent, but it is a very deadly poison. Very small doses will kill, so it ought to be excluded from the bill of fare as an unwholesome thing.) (Now, the popular idea in the world that these vegetable ~~na~~ poisons are unwholesome and dangerous, especially for a person who has rheumatism--that he should avoid vegetable substances containing acid, that he ought to avoid tomatoes, and should avoid apples and all kinds of sour fruit--this is perfectly true of the oxalic acid of the rhubarb, because the rhubarb contains oxalic acid, and it is true of certain vegetables such as spinach, for example. Spinach contains a considerable amount of oxalic acid, quite a large amount, more than any other vegetable, so it is true of spinach. Now, do not be frightened. The spinach you saw on the bill of fare a day or two ago had been treated, it had been subjected to Sanitarium treatment, and the oxalic acid was all taken out of it. You notice the spinach sometimes has a very sour taste, and the spinach is not allowed to be served upon the table of our dining room here until it has been parboiled, and when it is parboiled, the oxalic acid, being very soluble, is dissolved out, and the water is turned off, and the spinach is a great deal better when treated

in that way any way, so the spinach is all right if you parboil it and take the oxalic acid out; and rhubarb will be all right if you will parboil it and take the oxalic acid out of it, but whowould want it? The rhubarb would lose its flavor and reputation very soon if you should take the acid out of it, because it is eaten as an acid vegetable. It comes very early in the spring and is quite popular on that account, because it takes the place of fruits; it is something green and fresh from the garden, and having an acid flavor, it is taken in place of fruit; but it is a very great mistake. Attention was called to the fact that rhubarb contains oxalic acid more than forty years ago. I remember very well when the professor in the New York Agricultural College first called attention-- Prof. Law(?) first called attention to the poisonous qualities of rhubarb; and yet it is still reared in our gardens and sold in our markets, and still eaten unsuspectingly by the great majority of the American people. Nothing could be more absurd. You might just as well go down to the drugstore, get oxalic acid, and take it in small doses, mix it up with a little water, put a little sugar in it, and make a drink out of it; but if it were taken in so large doses as that, every now and then you would find some one being killed by it. When I took charge of the institution here thirty-five years ago, I found rhubarb being freely used, regularly served on the table in spring time. We had a nice large vegetable garden, and the gardener felt very proud of his enormous stalks of rhubarb that he was able to produce; so I found myself quite unpopular when I prohibited rhubarb; every one was clamoring for it; it was a very popular dish in those days. I took thirty people. They did not know they were going to be made subject to experiment, and I took thirty people, and examination was made of the urinary excretion, and there was no oxalic acid present. Then we had rhubarb for dinner, and the same thirty people were asked to provide specimens, and these specimens of urine were examined, and every single one contained a large amount of oxalic acid. Now, oxalic acid in the body behaves very much like uric acid. It has practically the same effects in the body as uric acid has. So when a person's

blood is flooded with oxalic acid he is in the same condition essentially as though it were uric acid instead of oxalic acid; essentially the same effects are present as when he is suffering with uric acid poisoning. It is for this reason that oxalic acid is particularly bad for persons who are suffering from gout or from any other disease in which uric acid is present in large quantity. People who have a crippled liver, are particularly subject to injury from taking oxalic acid, because when a person takes oxalic acid, the liver has to deal with that oxalic acid, the liver has to destroy it; it has to neutralize it; the antitoxic glands all have to deal with it.) (Now, the effect of the other acids, of citric acid and malic acid and tartaric acid, the food acids--and those three constitute the entire list, those are all the food acids, those three,--these three food acids act as real foods in the body. They introduce to the body these alkaline salts which I mentioned to you; they are in the form of acid salts, they are not completely neutralised, so they have an acid flavor although they contain a large amount of alkali. The effect is not only to increase the alkalinity of the blood, but these acids have a food value, and these alkalis have the effect to neutralize to some degree the evil effects arising from taking foods which are known to produce an acid state of the blood or to diminish the alkalinity of the blood, to be exact. Now, this is true of meat, and it is also true of cereals. When one takes wheat or wheat flour, for example, or barley, rye, or oatmeal, and burns the wheat, in the ashes that are formed there is found an excess of acids; and the ^{very} same thing happens when these cereals are used as foods. The residue, the material which is left in the body after the wheat has been burned up to a proper degree, is acid; so they have a tendency to lessen the alkalinity of the blood; if one eats an excess of cereals, the effect is to diminish the alkalinity of the blood. The effect is the same as when one takes an excess of meat, only it is not quite so bad. Meat contains several times as much of the acid forming material as wheat does, for example; still if one lives almost exclusively on cereals, the effect is to diminish the alkalinity of the

blood and lower vital resistance. That is ~~wxayx~~ why pigs do not do so well when fed on an exclusively corn diet. That is the reason why horses must eat hay along with their corn; it is because on corn and oats alone the alkalinity of the blood is diminished, the animal gets hidebound, has pimples and sores on its skin, and does not thrive. And the very same thing is true of human beings; the excessive cereal diet has the effect to diminish the alkalinity of the blood, lower resistance, and lessen the vital stamina, and the vigor of the body. So there is a great use for these fresh vegetables. This point has not been so well understood until comparatively recent times. In fact, I am sorry to be obliged to confess that I was in error myself upon this point twenty-five or thirty years ago, and I did not eat vegetables for some time because I thought it hardly worth while, they contain so little nourishment; but there is a valuable assortment of salts in the vegetables that we need, and it is highly important that we should make free use of them; that we should use them daily, if possible at every meal, as a part of the bill of fare, rather than to use the cereals so exclusively; and one of the best of all the vegetables is the potato. Now, I astonished some of you a while ago when I mentioned the potato as containing a considerable amount of citric acid and malic acid. This is nevertheless true. Some time ago I was giving some lectures to our nurses class on batteries, a missionary nurses' class I had given instruction to on the subject of electricity; they were most of them going out as foreign missionaries to the mission fields, and I wanted them to be well equipped, to be able to make batteries extemporaneously, if necessary, to extemporize a battery in an emergency if they could not get supplies from home. And after giving them the principles, I asked them to go out into the neighborhood and pick up some materials to make batteries; and we had a contest to see who could make the best battery out of the poorest material. And it would have interested you very much to have seen that exhibition. Here came in one with a battery made out of a can of tomatoes. Here were some

tin cans with tomatoes that came in them, and some bits of zinc made from a piece of zinc under a stove, and some bits of copper that had been gotten off of an old copper kettle, and a piece of wire picked up from a junk heap; and here was really a good battery that would actually run a Faradic machine. and do business. Well, another came along that had the best battery of all, made of raw potatoes grated up and packed around some old scraps of zinc and copper with some bits of iron that had been picked up, and it was really an effective battery, a battery with which treatment could be given to relieve pain, or to make muscle contract; and it was really a very effective battery. So the potato really contains acids which are in combination with these salts, soda and potash salts; and this renders the potato an exceedingly valuable article of food, ~~xxxxixxxxx~~ ^{the fact} that it does contain these acids and these salts associated with them. We haven't enough salts in the wheat, but in the wheat and the rye and the barley we have an abundance of lime which is absent from the potato almost entirely. That is a curious thing isn't it? The potato grows in the ground, and yet has only about a grain and a half of lime in a pound; whereas the wheat has four grains of lime in a pound. A pound of potato has seven times as much of these alkaline salts as we have, seven times as much,--a very large proportion in favor of the potato, so far as the salts are concerned, these alkaline salts, soda and potash; so when the potato has ~~xxxxixxxxx~~ a deficiency of lime, and the wheat has an excess of lime, it needs the acid to combine with it, and the potato has the acids, and so has the alkaline salts; so a diet of bread and butter and potatoes is better than a diet of bread and butter alone; so we see there is some sense in a diet of meat and potatoes. If you are going to eat meat, you ought to take potatoes with it, because you ~~xxx~~ will need the potatoes to neutralize the meat, you need the potatoes as an antidote for the meat. Please do not put this down as a recommendation of meat, or a meat diet, because there is one fatal deficiency, if you depend upon a meat and potato diet, and that is there is practically no

lime in either one, and your ~~teeth~~ will decay early, your bones will become weak, and you are liable to various other difficulties that grow out of a deficiency of lime. So a diet of bread and milk and potatoes, or bread and buttermilk and potatoes would be practically a perfect diet because milk contains fourteen grains of lime to the pint. A pint is a pound, you know. Meat contains only half a grain of lime to the pint, while milk contains fourteen grains; that is, cow's milk. So you see there is really a science of eating, or a science of dietetics; and it is important to know these practical things. The American people will be immensely better for a larger use of potatoes. There is no doubt about it. If we could quadruple the amount of potatoes used in this country, it would be a very great value to the American people. There is somehow a prejudice against the use of the potato. I think it must be a sort of vestige of the old prejudice that grew up in the European countries when the potato was first introduced, away back in the sixteenth century. The potato was just becoming popular, and it happened that at the same time the leprosy was spreading through Europe, and so somebody started the libel going that the potato was the cause of leprosy, just as somebody started the notion about fifty years ago that the tomato was a cause of cancer. I was a member of the State Board of Health ^{thirty} ~~thirty~~ years ago and I was appointed a special committee to investigate that question and find out if the tomato really was a cause of cancer. So many people were writing in to the state board of health asking that question, and the board asked me to try to settle it, by making a widespread inquiry about it; and I sent out hundreds and hundreds and hundreds of letters to doctors to know if any one had ever discovered the slightest bit of evidence that the tomato was the cause of cancer. I didn't discover any. It was simply a libel upon the tomato, a thoroughly wholesome vegetable-fruit. So it was with the potato. And it seems we have not yet recovered entirely from this prejudice. People say, "Oh, the potato makes people ~~hixix~~ obese; it is dangerous to eat potato if you have got as much flesh as you want and you are afraid of getting a little more,

you must not eat the potato; it would be a dreadful thing to eat potatoes." This is, as I intimated a moment ago, a libel; it is not true. The potato won't make you fat unless you eat too many. If you feed a pig one potato a day I will guarantee he will never get fat in the world; but if you feed him half a bushel of potatoes a day, he might. It makes a difference how many potatoes you eat you see. You can starve to death and eat potatoes for dinner every day. It is only a question of quantity, a question of quantity entirely. But there is another thing that may tend to obesity in the use of potatoes. Please don't make a wrong interpretation of what I am going to say; that is, the potato aids digestion. It is one of the best helps to digestion I know of if it is eaten properly. I am not talking of Saratoga chips now, remember, for they are quite another thing. Saratoga chips are pickled potatoes, potatoes pickled in grease, and they are almost safe from being digested in the stomach as if they were put away in a glass case somewhere. They are very, very difficult of digestion, because the starch is burned, the fat is burned into the starch, just fried in at a temperature far above boiling point, baked in, and they are very indigestible just as all kinds of fried farinaceous foods are, whether cereals or vegetables. But I am wandering just a little bit. So many ideas come along I want to drop in that I am likely to get off the main question. Now, the potato, as I said, is a sort of antidote for the meat, and it is useful on that account, and you need not be afraid it is going to make obesity unless you eat too many. It is simply this: if one eats no more calories than he ought to eat in one day, it makes no difference whether he eats potatoes or bread or something else so long as far as his weight is concerned, or whether he eats butter. He might eat butter if he eats no more calories than he needs, he will not gain a bit in fat. Now, if you do not get into your bank account every week any more than you are taking out of the bank every week, you may be sure your bank account is not going to increase in size. The bank man is not going to put something in there out of

his pockets just to have the pleasure of showing you a growing bank account. It is exactly so with the body. Food is fuel, and if we do not put into the body every day a little more than we are using every day,--you see it is simply a question of outgo and income, and we can not gain. But now the question of indigestion,--I must say another word about that. The potato is charged with being a cause of indigestion. One says, "The potato always sours on my stomach, makes gas on my stomach, ferments. The doctor told me starchy vegetables will not digest, and I must avoid all starchy vegetables, for they are very dangerous." I have found a whole lot of people that almost had what you might call a starcho-phobia; they are so afraid of starch, some of them think they were likely to swell up and explode, or something of that sort; they were certainly very much afraid of any sort of starchy food. Now, the most innocent food element of all the list is starch. Carbohydrates are the most easily digestible, the most readily absorbed and make the least trouble in the body; and not only that, but they are a protection against the evils which we are likely to suffer from taking a too large amount of other food elements; and the potato is really the most easily digestible of all vegetables. It never produces rheumatism, it never oriduces indigestion. The fault is we do not eat them right. Now, the potato is digested by the saliva; there is almost no protein in it; it is starch, and it is the business of saliva to digest starch.) And if we swallow the potato post haste, simply gulp it down as most people do mashed potato--I saw a man eat some mashed potatoes the other day, who was a little excited about something else, and he quite forgot himself with his talk, and he was just shoving it that mashed potato down about as fast as he could get it to his mouth, as though he was shoveling coal into a hopper. It seemed to be a perfect stream. ~~xxx~~ It really seemed to me there must be an open pipe in there somewhere, and the potato was dropping out as fast as it g^t in. That is the way people eat sometimes. (Now, potato can not digest in the stomach without saliva. Gastric juice can not

digest potato. If a man swallows a lump of baked potato not properly masticated, and swallows lumps, even if they are small lumps not bigger than a pea, even if they are not bigger than a grain of wheat, minute lumps not bigger than a mustard seed, those lumps of potato will lie there in the stomach and will not digest. The gastric juice can do nothing to the lump of potato because it is nearly all starch and woody fiber, so it hangs together. Now, it is entirely different with a piece of meat. A dog takes a piece of meat, gives it two or three bites, and down it goes. He just simply chops it. You can hear the dog's jaws going as he is chopping the meat, and he chops it up a little bit, and down it goes, and he is ready for another one. The dog just takes a piece of meat, takes it into his mouth, and down it goes, and he is ready for another one. He does not have to masticate it or fletcherize it, or maserate it with saliva. Why? Because the beef has nothing in it that requires the action of saliva. You could make a hole into that dog's stomach make a window such as Dr. Beaumont's man Alexis St. Martin had, and could drop that meat down into that dog's stomach and it would digest there if it had never been in his mouth at all. It would help the dog if he could see the meat, or if you let him smell it, that will give him some assistance in the digestion; it will digest quicker; but he doesn't have to chew it; doesn't have to mix any saliva with it at all; it digests without chewing. Why? Because the meat is digested entirely and completely by the gastric juice that is formed in the stomach; but it is entirely different with the potato. The gastric juice can do nothing to the potato except to digest ~~and~~ just the veryminute amount of protein which it contains, which is so small as to be really negligible; but it requires the action of the saliva which has for its business to digest starch of which the potato is almost wholly composed; so when one swallows a lump of potato into the stomach, there it is; it still lies there, stays there undigested. If there is a little saliva gets down into

the stomach that saliva is just enough to digest a little of the starch, to make a little maltose, dextrin, and that has a wonderful effect in stimulating the stomach to produce gastric juice. That is where the potato comes to be a useful aid to digestion. The starch of the potato is more readily digested than almost any other starch. The saliva acts upon raw starch, converts it into maltose and dextrin, and this maltose and dextrin, being formed in the mouth, set the stomach to going, and then the peptone that is formed in the stomach, and the gastric juice set the pancreas going, and the pancreatic juice that is formed and the bile set the other juices going further down in the intestine. That is the way this thing is arranged. It is like a line of bricks set up just far enough apart so when one is tipped over ~~the~~ it hits the next one and tips it over, and it knocks down the ~~next~~ one, and the next one and the next one, and if we had a line of bricks reaching all around the world, if you tipped over one brick you would upset the whole line of brick clear around the world. That is the way it is with the thirty feet of alimentary canal, and if you start in the digestive process in the mouth right, that sets the stomach going, and the stomach sets the liver and pancreas going, and they set the small intestine going, and the whole thing goes right. Now, then, suppose you do not tip over the first brick, you can readily see if you don't tip over the first brick, that line stands there; there is nothing doing. It is exactly so with digestion. Now, the potato is extremely useful as an article of food for this particular reason, that it is acted upon so readily and quickly by the saliva, and forms the maltose and dextrin which are a sort of tickle to the stomach and set the stomach to ~~pouring~~ pouring out its gastric juice. You know there are some things that make people laugh until they cry, and the tears just run down the face. It is just so with the stomach; it is so happy to get some good, well chewed potato into it that it weeps for joy, and if you could look into it you could see the gastric juice trickling down the walls of the stomach just as perspiration

sometimes runs down the brow. That is what Beaumont saw in the stomach of Alexis St. Martin. So the potato, you see, is very useful; but when you swallow potato in lumps, not being properly masticated, there is just enough of the potato digested to cause the stomach to make gastric juice, and the gastric juice just lies there, it has nothing to combine with it, it has nothing to do any work upon, so there is nothing it can do, and the lumps of potato can not get out; the pylorus is shut up tight, and won't let it out unless it is reduced to liquid, for only liquids can get through the pylorus; so these lumps stay there, and the acid is formed and ferments there, and gets more and more acid, more and more acid, and the stomach works harder and harder to get rid of those lumps, and they won't dissolve, can not pass out, and by and by the stomach gets to ~~makingxxxxxx~~ contracting so hard that some portions of the acid contents go up into the mouth, and you say, "Oh, that potato has fermented." Now, the potato is not fermenting at all; "the potato is sour," you say. The potato is not sour at all; it is the stomach that is sour, and it is sour only because there is an excess of gastric juice that has nothing to act upon. Now, the remedy, then, for having a sour stomach after you eat potatoes is to eat potatoes rightly; chew them, fletcherize them, until the material that goes down into the stomach is a perfectly smooth puree, just as smooth and as free from particles as it is possible for it to be, so that when you examine it--and that is the proper way to do--to examine every morsel with the tongue by pressing it up against the roof of the mouth,--and when you rub the potato against the roof of the mouth, and the tongue, there are no particles to be felt. Now, if you eat the potato that way, it is one of the most easily digestible things I know of.) (In Germany when babies can not digest anything else, they give them potato flour. When I first saw that statement made by a German doctor some twelve or fifteen years ago, I simply did not believe it. I said, "Why, potato is hard to digest. Haven't I met a great many people who complained that they could not digest potatoes, and don't they sour

on the stomach? Aren't they hard to digest? Didn't I wash a man's stomach out once and find a couple quarts of material, and baked potatoes that had not been digested at all?" Those thoughts all came through my mind--what my experience had been with the potato. I said, "Is it possible? I will try it." So we had a very skilled German chemist in our laboratory who was well trained and a very accurate man, and I ~~said~~ set him to work on the problem to find out which would digest the most quickly. I marked out a plan for him and set him to work on it,--oatmeal, wheat and corn--those three, in different forms, compared with potatoes. And I found that the potato digested six times as quick as wheat, and four times as fast as corn. I was amazed. I repeated the experiment again and again and again, and found it came out that way every time; the potato was six times ahead of anything; so I had to change my mind about that; and I immediately began giving some more attention to potatoes. I had not eaten potatoes for years at that time, and I added potato to my bill of fare, and to the bill of fare of a good many other people. The potato has been abused and neglected, and is today one of the most neglected of the splendid foods which this country produces. If we should devote more land to potatoes, food would be a great deal cheaper.)

Land that is adapted to potatoes will produce enormous quantities. Four hundred bushels to the acre ² Mr. Grubb tells me he always gets. His land is irrigated, so he is never troubled for want of water, and he is the great potato expert in the country. He called on us the other day to see how we cook potatoes, and made me promise to write an article about potatoes, and that is the reason why I am telling you these things, because I talked to him half an hour in the office about it, and he is getting out a book on potatoes by request of the United States government, and has just been over to Europe two years studying potatoes, and he is full of potato ideas. He gave me some good ideas, and I gave him a few perhaps, and I promised to write a little chapter for his book, and I am telling you some of the chapter I have been writing. Mr. Grubb told me he gets

400 bushels to the acre. That would be 100 bushels of dried potatoes, because the potato is about three fourths water,--100 bushels of actual nourishment. Now, if it were wheat, how many would you get? Wheat would make perhaps sixteen or twenty bushels without the bran, and we wouldn't have,--of the twenty bushels of wheat we would have about the equivalent of sixteen bushels of real nourishment. So you see the potato is six times ahead of wheat in producing food, that is, on the same ground plan. That is, (we are bread eaters largely in this country, and we need more potatoes to even things up. I told you one way to avoid any difficulty coming from the fermentation in the stomach of the potato; the excessive formation of gastric juice can be avoided by thorough chewing. Perhaps your stomach produces too much acid occasionally. You are suffering from hyperacidity, but you must add a good quantity of butter to the potato, or you must take with it a butter gravy, a ~~nut~~ gravy made with flour and water and butter added--~~agx~~ good rich gravy--not burned butter, not fried butter; that is very indigestible and very harmful to the stomach; but simply plain butter added to the potato, a quantity of ~~ir~~; or cream which is better, rich cream, and baked potato with rich cream on it, and just a little flavor of salt if you want it. And curiously we seem to want salt when we eat potato, because the potato contains almost no ~~salt?~~ soda, and there is a tendency to want salt with the potato, and probably it is perfectly harmless--a little salt taken with the potato is perfectly harmless, provided you are not suffering from Bright's disease or from any other malady of that sort.) But I must hurry on.

Q. Can hyperacidity be cured?

A. Yes, hyperacidity can be cured. I have never met a case yet in which I considered it incurable. It is always curable. It is necessary that just the right thing should be done. And you know one of the things to do is not to fletcherize. There is one disease in which one should not chew his food. But he should eat food that doesn't need to be chewed. He should eat food that

does not need to be chewed. He should eat food that does not require chewing. Now, there is a good, sound reason for it. When we chew food, it causes ~~xxx~~ the stomach to make gastric juice. While the food is still in the mouth, the stomach is pouring out appetite juice, as Pawlow calls it, pouring out gastric juice in abundance. That is exactly what you do not want your stomach to do. It is making gastric juice enough already; so you do not want to encourage it to make gastric juice by chewing. Take food that does not require chewing; and this does not mean fruits, and does not mean gruels, and does not mean that kind of soft, liquid material, because they contain too much water, and water will cause the stomach to pour out a superabundance of gastric juice. Pawlow proved that too with experiments upon dogs. When a dog took a pint of water, the water went into the dog's stomach, and the gastric juice poured out in great abundance; and these people who have suffered from hyperacidity--I have often been told by such patients, "Why, Doctor, I can not even drink water; even water sours on my stomach." They have the idea that the water ferments or sours, but it is a mistake. The water simply stimulates the stomach to make gastric juice, so we must avoid liquids and avoid soups, but you will say, "What shall I do, then? If I eat fried food, I must chew. I could not swallow it unless I did chew." What you want is to eat food in the form of a thick puree. Gluten mush that you get on the table, or granola mush are good examples of the sort of food that is good--not oatmeal mush, because oatmeal mush forms masses in the stomach, lumps, and is on that account most undesirable. Another thing I should mention as a cure for it is that the bowels must be made to act freely three or four times a day, because poisons absorbed from the colon are excreted into the stomach and excite the stomach, and are unquestionably to my mind the chief cause of hyperacidity, or one of the chief causes at any rate.

Q. Is salt injurious to persons suffering from diabetes?

A. Yes, an excess of salt is very injurious, because in diabetes the

kidneys are overworked. A little might never do any harm. The kidneys lose their ability to eliminate salt, and the salt then accumulates in the body and produces dropsy. Every person suffering from dropsy has inability to eliminate salt. The body retains salt in the proportion of one part of salt in 140 parts of water. It won't have it in any other proportion; so when you take an ounce of salt into your body, you have to have 140 ounces of water to hold it in solution; and there is no room for it in the blood, so it goes out into the tissues and the water goes out with it; so they accumulate, and that is the reason why people have dropsy; that is the cause of dropsy. So people that have dropsy should never eat salt. It is a very common thing to see dropsy disappear with very great rapidity from a person who stops the use of salt. Persons suffering from epilepsy also should avoid salt.

Q. Is oil made from peanuts good food?

A. Yes, it is wholesome food provided it is good oil. If the oil is rancid then it is bad. It is a little more digestible than olive oil and is better for people who suffer from hypopepsia than olive oil, because olive oil of all substances known lessens the activity of the stomach in producing gastric juice. Pawlow's experiments showed that olive oil will inhibit or prevent the stomach from making gastric juice to a greater degree than any other food substance he knew of.

Q. What are the best foods to furnish phosphates to the system.

A. Phosphates are found in the whole grain cereals, in wheat, rye, barley and oatmeal.

Q. If a man breaks down at the age of forty, can he come back and get well?

A. If he comes back to the Sanitarium, he will have a very good chance provided his breakdown is not too bad a breakdown. There is no question that the majority of people who find themselves broken down have a splendid chance still

for many, many years of usefulness. We had here a couple of years ago a visit from a man well known in this country. I would not say what I am going to say here now if he had not himself said it from this very spot on a number of different occasions publicly, and revised the copy of the report of his remarks for publication; so he was perfectly willing the whole world should know. I heard him once before a large audience of several thousand people, at Chautauqua, N. Y. say what I am going to say now. He said he came to the Battle Creek Sanitarium a broken down man. He said he thought his business career was finished. I know he thought seriously of disposing of his business, the McClure's magazine, which he publishes. He felt he had but a short time left to live, and for five or six years he had been a wandering invalid, not able to give his business proper attention. He came here, just looked in, spent one day, sort of went around and smelled things here. He was a very acute, keen man, and he looked into things. He said, "I am coming back", but he didn't come. Several months afterwards, however, he did come, and when he came he said, "Now, I am going to try this thing out"; so he put himself upon a low protein diet, cut out meats, cut out tea and coffee, took the treatments properly, patronized the outdoor gymnasium, and he got so perfectly fascinated with the outdoor gymnasium it was very hard for him to keep his clothes on in the house; so he had to go up to his room and take his clothes off and go to bed for the purpose of getting his clothes off; he simply could not stand it. He found such delight in returning to nature, found himself coming up and his old good feelings coming back that he had when he was a boy, the old spring, the vitality, and the reserve, and surplus he used to feel, he felt coming back, and he wanted to encourage it in every way he could. At the end of three months, he was a reconstructed man. Mr. McClure is going to be here shortly, when he comes back from Europe; he is coming back here again. If you should meet him, you would certainly say he was a live wire; but he was not two years ago last spring. He was a rusty wire; but at the present time he

is certainly as smart as a trap. He is just brimful of enthusiasm. The only trouble he has, he says, is that he can not get tired enough to go to sleep. He does not get tired at the end of a day's work, but he just wants to keep right on working all day and all night, and he can not get tired. Now, Mr. McClure sticks to this thing most thoroughly and conscientiously. Somebody asked him when he was here last time if he didn't eat meat occasionally when he was traveling. "Eat meat?" he said; "I would just as soon think of ~~getting~~ going out on the street and getting down on all fours ~~like~~ and licking up dirt out of the street as of eating a dog's diet. I do not eat anything that rots." Now, Mr. McClure made these statements that I am making to you here in public right before hundreds of people in this institution; so I am simply repeating what he said. He is a good example of a man who was down and has come back. Just a little while before I saw Mr. McClure the first time, I ~~saw~~ met the representative of a rival paper who was here soliciting advertising, and he was speaking of McClure's. He said, "McClure's,--why, McClure's,--you knew that didn't you? Why, McClure has been down and out for several years. Haven't you heard that? His magazine is going to be sold, to be absorbed by some other publisher." That was a short time after Mr. McClure's first visit here, before he came to stay a while. I said to him, "You must not be too sure about that. Mr. McClure has turned over a new leaf lately, or is thinking about it, and something may happen." Well, the thing has happened. McClure's magazine never had so good a future before it, never had so large a circulation as it has now; he himself was never so efficient; and I heard him say at Chautauqua after a month's visit here, "I have added twenty-five years to my career." He is really exceedingly enthusiastic about it, and he still is, does not lose his enthusiasm, because he finds every day it pays to coach himself in efficiency, and he gets results. That is what the business man is after these days.

Q. Why do you object to the use of pepper and vinegar?

A. Because they are poisons. The acid of vinegar is acetic acid which is an acid resulting from fermentation. It is a process of fermentation, of decay; but acetic acid is not a food, and when taken into the body it behaves like oxalic acid and interferes with digestion. One part of acetic acid in a thousand parts of water will entirely prevent the digestion of bread. Just think of it. One part in a thousand will do that; so a teaspoonful of vinegar will upset a whole meal, destroy the digestion of all that meal; so it is a good thing to abstain from vinegar; it is a poison. Pepper is an irritant, and also a poison. Oil of cayenne is almost as deadly a poison as prussic acid. It only takes twice as much cayenne to kill a man as of prussic acid. Now, you know prussic acid is a deadly poison, and it only takes twice as many drops, a couple of drops of prussic acid will kill a man; and twice as big a dose of oil of cayenne will do it. The only thing that saves the people of the country from being poisoned with pepper and things of that kind is that they are adulterated. If you got the pure thing, very few people could survive the first attack; but they use cocoanut shells and all sorts of things to adulterate pepper, and I have never made any complaint about it; I have always been thankful it was adulterated.

Q. Is the city water good?

A. It is good for baths but not for drinking purposes. There is no typhoid fever or no specific disease in it, but the water that comes from lakes and rivers, open water courses is never wholesome water for drinking; it always contains bacteria, is liable to contain parasites; fishes are present, and they are passing their excreta into the water continually, and they are greatly infected with tapeworms, and have many kinds of parasites. There is no other sort of animal that is so much infected with parasites as fish. Fish eat all kinds of filth; they are scavengers, eat the offal in the water, the product of sewers, and consequently this water from public water courses is always more or less contaminated.

Q. What takes the place of meat in nourishment?

A. Meat is one of the things that does not have to have any substitute. We have a few substitutes here, protose, nuttolene and things, but they are provided only because of the hardness of your hearts, and not because they are needed.

Now, I have just a little experiment here I would like to make for you. Somebody asked me what is the best bread, and I promised to answer it tonight. And my answer is granose biscuit. I consider granose biscuit the only perfect bread. Now, I am advertising tonight. I want you all to eat granose biscuit. I can hardly remember when I have eaten any bread at all of any sort except Granose biscuit, with the exception of rice biscuit. Rice biscuit is equally good but is not as superior a food and is not as good a substitute for bread, though it has somewhat more tasty properties; but granose biscuit is a perfect bread. Each grain of wheat is cooked thoroughly, then each particular grain is crushed out into a thin flake, and these flakes are pressed together in ~~xxxxxx~~ the form of biscuit, baked and toasted, and are completely baked and perfectly light and as crisp as anything could be. Years ago I got into trouble. I recommended a lady to eat zwieback. She came to me after a few days and said she had a bill of ten dollars against me for smashing her teeth. It cost her ten dollars to get her plate fixed, and my prescription had smashed her teeth. I said to myself, "I have got to have some sort of ~~xxxxxxx~~ toast that won't smash teeth, and that people can eat who have false teeth, and that people can eat who haven't any teeth at all, or that have sore teeth; so after a number of years I succeeded in devising a plan for making granose flakes and biscuit, and that was the origin of the flaked foods; it was our effort here to get something that people can eat without teeth. You see you can masticate granose with your hands. Granose biscuit is completely fletcherized without the use of any teeth. "But," you say, "how about these people that must not chew?" The biscuit is just

the thing for such a person. I add a little water, and you see what happens now to this biscuit. It doesn't require so much as I have here. I hold it up here, and you see how it is swelling out. In just a moment this will be reduced to its original flakes. There it is already; it is less than a minute. It has taken only about fifteen seconds. Now, if I should take the flakes in my hands, a quantity of this biscuit,--now I have it smeared all over my hands here, you see. Now, observe that simply pouring a little water on it, it is washed off. Now, if that had been oatmeal, it would still be sticking to my hands. Please observe too, that the water that is above the flakes here is perfectly clear; the water that is poured off here is perfectly clear. It is because the flakes are perfectly baked. Now, when taken into the stomach, the fluids ~~ix~~ of the stomach soften and completely disintegrate the bread at once; there are never any chunks left there. I asked Mr. Fletcher what was the hardest thing to chew, and he told me the crust of bread. For that reason, I notice, he seldom eats bread. Now, I want to call your attention to a loaf of ordinary raised bread, which is one of the most unwholesome articles ordinarily eaten. We serve it on the table here, but as I said before, only because of the hardness of your hearts. Now, I have taken out the crumb, the center of the bread. The crust is difficult to digest because it is difficult to chew, and when we wash out the stomach of a person who has indigestion, and part of it is bread, we always find particles of these crusts. When everything else is gone, the crusts are still there. You see, this center of the loaf would make a good baseball or a cannonball. A great number of people have been damaged seriously by being hit with bread bullets in their stomachs. Here it is, you see, a good baseball. Simply chew it just as you chew hot bread and butter before it goes down into your stomach. There it is, still intact, after bounding on the floor. I throw it as hard as I can against the wall, and it is still perfectly intact. I will leave it here for you to examine. I recommend granose biscuit as I said before, as an ideal bread; but

the old fashioned hoecake of the South, the water bread cooked in the form of a cracker, if it is thoroughly chewed, or the beaten bread of old Virginia, are wholesome breads; but raised bread is an unwholesome thing. The interior of the loaf is never thoroughly cooked; it contains active germs ready to grow in the stomach. It is produced by a process of fermentation in which there is bacterial growth as well as yeast growth. Some of the very finest flavors of the bread are destroyed, and some of its important nutritive elements are lost also, destroyed, and when taken into the stomach it is exceedingly hard to digest. But I must let you go because I have another appointment. If any of you would like to examine this ball of bread, you have the opportunity.

v-6-11-11.

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THE NON-FLESH vs. THE FLESH DIET.
THE EVILS OF TOBACCO USING.

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

June 15, 1911, at 8:00 P. M., By,

J. H. Kellogg, M. D.

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Before beginning on the subject of tobacco which I have chosen for the evening, I want to say a few words about food. The subject of food is such an interesting topic here, at least three times a day, it is a matter of interest that it will be I hope of interest to some of you to know something about the value of the great classes of foods, fruits, vegetables, meats, and other foodstuffs. A good many people are afraid to make a change of diet, afraid to drop out the beefsteaks and the mutton chops, and the bacon, ham, and the various things they have been accustomed to eat in the line of fresh food,-- they are afraid to make the experiment. ~~ix~~ The idea is somehow abroad in the world that it is necessary to eat meat to be strong; that meat is a strengthening food, that it is a building up food. It is so common for doctors to say to a patient when they find a patient run down a little, "You must eat more meat; eat good red meats, good rich beefsteaks, juicy beefsteaks, juicy chops, etc." I don't know how this idea originated, but it has come to be a very current notion; but there is absolutely not the smallest bit of scientific foundation for it. Nobody can produce--I defy any physiologist or any physician that lives on the face of the earth to produce any scientific proof that flesh food is a particularly strengthening and building-up food. As a matter of fact, when we look the world over, we find that the largest animals, and the strongest animals are not the meat eating animals. For example, how does a lion or a wolf or a dog compare with an elephant? Or a hippopotamus--those tremendous beasts,--an elephant that will carry off a whole carload on his back, pretty

nearly, and yet that animal is sustained entirely by grass and leaves, fruits and herbage of the very coarsest character. The fact is that the purest energy, the most dependable and the most strengthening sources of energy are to be found in the vegetable kingdom. When we are eating an animal we are only eating vegetable foods at second hand. We are not eating refined and improved food, food that has been purged of its coarser elements and is brought into a state of special value and efficiency, and concentrated food; but the very opposite. We are eating food that has been used, that has been eaten before, and it is contaminated by its use, and is more or less damaged, and only presents to us a residue of what it formerly was. Beefsteak is entirely comparable to ~~an~~ a second-hand coat, or a second-hand dress, a second-hand shawl, or a pair of trousers, a partially worn out hat, or a pair of shoes,--entirely comparable to worn garments. Now, just see, when you go to a second-hand store, and are going to buy a second-hand coat, if you are in an emergency of some sort and you feel under the necessity of taking them, you hadn't money enough to buy a new coat, and had to buy a second-hand coat, what is the very first thing you would think about? You would begin to think about parasites, perhaps; at least, that is the thing I would begin to think about. You would take that coat up and look at it, and you would say, "I wonder if there is anybody here already? I guess I better shake this coat. It might be a good thing to take it home and fumigate it; it might be inhabited, who knows?" If there was just one wild beast roaming around that coat, you would hesitate to put it on,--just one. Beefsteak is entirely comparable with that. The beefsteak that is before you on the plate, that looks so juicy and so inviting to one whose appetite has a tendency that way--not to me, though, I assure you,--that beefsteak if you look at it with a microscope, you might find that it was very numerously inhabited. What might you find in it? You might find in it young tapeworms, you might see little bits of white specks in it. I have seen many a steak of that sort--little white specks in it; and

if you put that little white speck under a microscope, you would find inside of it a pair of hooks, and if you should swallow that, those hooks would fasten themselves into your intestinal wall, and pretty soon they would begin to grow out of those hooks, there would be a bigger body, and another one, and another one, getting bigger, and bigger, and bigger, until by and by there might be 50x2 500 little square, rectangular bodies attached to that head, with a pair of hooks on every one of them, and every one of them a tapeworm, every one of them a double worm, for the tapeworm is a bisexual animal. Each one of those little sections of tapeworm is both male and female, and is producing eggs by the million every day, and the tapeworm itself is a community living in a procession, and the first member of the community hangs on, and the rest all hang onto him, and the biggest at the tail end, because those at the tail end are the largest. These segments keep dropping off at the tail end as they get old, and after they are discharged from the body they may live for some days, wriggling about and casting off their eggs; and a person carrying a tapeworm is throwing off thousands of them every day; they get into the water, the streams, the cattle drink them in the water, and the cattle get the young tapeworms in their flesh; but it takes two animals to develop a full grown, adult tapeworm. You eat tapeworm, they if you get it. Everybody who has tapeworm had to eat the young tapeworms before he got them. That is the way he got them--eating the young tapeworms in the beef. The chances are ten to one he got it from beef, and one to ten that he got it from hogs, from pork; for beef is particularly subject to it. So you see there is a perfect analogy between the old second-hand coat, and these wriggling creatures of various kinds, and the beefsteak. The beefsteak may have parasites in it as well as the old coat. Well, now, there may be some germs about that old coat; who knows. Maybe that old coat belonged to a man that died of cholera. Maybe he had typhoid fever; maybe he was simply an unusually dirty kind of character, and his clothing got saturated with the germs that thrive in dirt. That is exactly what you find in beefsteak, only you find more of them

there.

In beefsteak you are certain to find filth germs in great quantities. I defy anybody to bring me a beefsteak twenty-four hours old that has not billions of putrefactive germs, bacteria in every pound; worse than that,--trillions in every pound; for when we have sent down to the meat shops in our town, and sent to the hotels, and got the finest meats that they had, ready to serve to their customers, which are served to their customers, every time we have brought some of those beefsteaks to our laboratory and examined them, we have never found less than several millions--three, four or five or six or seven millions in just a small morsel of beefsteak as big as the end of your thumb. In every morsel, in every bit you put into your mouth of beefsteak, there are millions of filthy bacteria, the same sort of germs that you find in that dead rat in the closet that you find when you get home from a vacation, and that has scented the whole house up with its horrible effluvia,--the same sort of germs are found in every piece of meat you buy at a meat shop, and every piece of mackerel and ~~ix~~ codfish, and herring or halibut you buy in a grocery store,--they have all got these putrefactive bacteria by the millions. Now, I didn't know that myself until about ten or twelve years ago. I sent one of my assistants down to Johns Hopkins University in Baltimore to take some special studies with Prof. Simon down there. Now, Prof. Simon is known throughout the world as an expert in microscopy, and I sent one of my colleagues down there to study with him so as to be sure that we were up to date with the very latest methods. When he came back, he said, "Doctor, Prof. Simon told me something I think you will be interested in. He told me he didn't dare publish the facts in relation to salt meats, and salt fish. He said if he should publish the facts in relation to salt fish, it would break up the whole fish industry, and he didn't dare do it." I said, "Then certainly we ought to get right into that right away. I am interested in that." And we at once sent down and got specimens of codfish, and mackerel, herring and halibut, and all the other preserved fishes, and sure enough, we found it

exactly as Prof. Simon said,--simply swarming with bacteria. The smoking does not kill the bacteria, the salt does not kill the bacteria; it only prevents their growing; it only keeps them from growing; that is all. So that the bacteria are all there, just like seed that has been wet, and all they need is just a chance to sprout, and when you swallow them down into your interior, they find a nice, warm, comfortable place, just the sort of place the bacteria love; and they grow luxuriantly. There is no place where bacteria can flourish more luxuriantly than in the average colon where there are fragments of undigested food-stuffs lying up there in a warm, moist place, and the putrefaction can take place with very great rapidity unless it is prevented in some way. There are certain foods that are not only putrefactive in character, and undergo putrefaction, but in addition to that they contain the germs which produce putrefaction, and have already started down the road of decay, rottenness and putrescence; and that is the beefsteak you bought at the average shop, the best beefsteaks you can get. Prime beef means simply beef that is a ~~little~~ little more rotten than ordinary beef. And game that has been hung--you know what that means,--game that has been hung up by the neck until the body drops off, that has been hung--that sort of game is simply so far advanced in decay that it is ~~not~~ a choice tidbit for the turkey buzzard; but it is not fit for a human being to swallow. Well, there are other classes of foods that have not these characteristics. I am telling you about meats. This is the character of flesh; it is a second-hand diet, a diet that has undergone putrefaction, that is ready to continue the putrefaction after it has been swallowed into the human body. This is evidence that it is not natural food for human beings--a second-hand diet.

Now, if we go back to the natural diet, to food that is made for us, intended for us, that the creator especially designed for our sustenance,--and you can find that in the first chapter of the Bible, in the ~~fix~~ very first chap-

chapter of Genesis, and the 19th verse, you will find in the 13th verse I think it is, this: "And God said, Let the earth bring forth fruit trees after their kind. And the earth brought forth fruit trees after their kind. And it was so." Now, in the 19th verse of the same chapter, the first chapter of Genesis,--a god many people believe the old Bible still; some do not, but a good many of them do, so I think it is perfectly proper for me to quote it here, as the best evidence that we have, at any rate, the only historical evidence we have, and the best evidence we have as to what was the diet of the original man; and it says, "And God said to Adam, every fruit tree bearing fruit, and every herb bearing seed, to you it shall be for meat", or food. The word meat in the Bible means food. The word meat is not used in the sense of flesh. When flesh is mentioned, it is flesh, but the word "meat" in the Bible means simply food. "Every fruit tree bearing fruit, and every herb bearing seed, to you it shall be for meat." That is the original diet of man,--fruits, seeds, and herbs,--the unripened seeds probably. Now, here is a class of food that does not decay. When Mr. S. S. McClure was here some time ago, ~~XXXXXXXXXXXX~~ somebody asked him about his diet, what he ate. He was telling how fine he felt, and how much he had improved in the last two years, how he felt like a steam engine all the time, and the only trouble he had--he was telling it right here on this floor where I stand,--he said the only trouble he had was he could not get tired. He said, "It comes bed time, and I still find myself full of energy, and I hate to go to bed and go to sleep; I can not work hard enough to get tired." Now, when Mr. McClure first came here to this place two years ago last spring, he was tired all the time, could not get rested; but he changed his diet from beefsteaks to simple, natural foods that will not decay and will not poison the body, with the products of putrefaction, and he got so rested that in the course of a couple of years he could not make himself tired, could not work hard enough to get tired. The day was not long enough to make him tired. Now, it makes a wonderful difference to Mr. McClure. It means millions in his pocketbook, as well as comfort, because when a

man's mental efficiency is depreciated, it means his business is getting tangled up, getting into a snarl, getting away from him, and he is likely to have a catastrophe. I am not going to say that of Mr. McClure's situation, but I think I am at liberty to say that some of his rivals thought it was, and told me he was just going to pieces, and was as good as gone already; but he just came up smiling, as the saying is, when he got on a right diet, and his business is going right and everything is going on more prosperously than ever in the history of his very remarkable career as a publisher.

Now, here is one of the things that helped Mr. McClure in finding out the value of fruits. Fruits will not putrefy. The germs that live in meat, that are found in a rotting beefsteak, in that juicy beefsteak that you had that you thought was so very palatable, so delicious,--it is those germs that give it the flavor very largely. It is the poisons produced by the germs that you like the taste of; that is why you like it. Take those germs all out of it, disinfect the beefsteak, and it hasn't very much taste in it. Cut a piece of flesh off a living animal or an animal that is just dead and cook it, and you won't eat it. That is the way we did one time. We used to have a great deal of trouble, years ago when we served meat here, because we would not accept the meat from Mr. Armour, of Chicago, unless it was sent to us the very day it was killed, so we could have it absolutely fresh, as fresh as we could get it. Our patients said it was tough, "Oh, it is tough." We could not make it tender. Beef does not get tender until after it has rotted. It is the rotting that makes it tender. If it was not rotten, you would not eat it. Fruits are a class of foods that won't rot. But you say, "An apple decays." It does, but that is an entirely different thing. The process of decay in an apple is an entirely different thing from the decay of flesh. In the decay of flesh we have anaerobes, or putrefactive organisms that produce deadly poisons. That is not true of an apple; if it was, it would be dangerous to take a glass of cider. You know when the farmer carries off his apples to make cider, he does not pick off all the nicest and

soundest apples he has by any means. The kind of apples he sends to the cider mill are entirely different; and it would be instant death to take a teaspoonful of vinegar, for vinegar is the apple that has undergone complete decay or fermentation, the process has gone as far as it can go, and that makes vinegar. So when an apple is decayed, that is not like the putrefaction of meat; it is a process that is the result of the action of moulds and of yeasts, and is not at all due to the action of these anaerobes or putrefactive bacteria that give the dead rat ~~xxxxxxx~~ odor to decaying flesh.

Now, one reason for it, you see here, is that the fruit has very little protein. Here is the protein affording one per cent or less, and in some instances two or a little more; but on an average about one per cent is the amount of protein in apples. There is not enough of the protein element to support the life of germs that cause decay. Protein is the element that decays; but we have a large amount of carbohydrates, you see--that is the sugar,--in the fruit, 74% in figs, and it averages somewhere along from ten to twenty per cent--the amount of sugar; it is sugar in this case, but it might be starch in cereals, but in fruit it is sugar that constitutes the carbohydrates. And there is practically no fat at all there; see what a very small amount of fat there is. Many fruits have no fat at all. Figs have practically no fat at all. Apricots have no fat. Other fruits have about half of one per cent. Dried figs have a little, just a small amount. Here we have nectarines with no fat, and in fresh figs no fat, in dried figs a very small amount--practically negligible. So we see fats are almost entirely absent from fruits; fats and protein are about alike; scarcely more than one per cent of fat, not one per cent; but it is the carbohydrate; so fruits are practically all sugar and water and flavor. That is what fruits are. There is nothing there that can decay. Fruits may ferment, but they can not decay. Now, if we look at vegetables, we will find another class of foods that can not decay.

Here is about the same amount of protein in vegetables as in fruits, just a trifle more, a little more protein. We may say on an average in vegetables, the protein is about two percent, twice as much protein in vegetables as in fruits, but in very small amount. However, the amount is sufficient in many vegetables. For instance, here in the artichoke the amount is practically sufficient. Here is the carbohydrates which make about all the food value, 16%. One tenth of that would be 1.6. Only one tenth of our total food needs to be protein; so we see in the artichoke there is enough protein. Here in asparagus there is not quite enough- yes, there is enough here. There is more than one tenth of the total food value, so it is more than enough. It is about one third in this case, and in the case of the beet, you see, there is a little more there than the rule calls for. In cabbage there is pretty nearly twenty per cent of protein; about 25%. In carrots ten per cent, and that is enough; in cauliflower there is more than enough; so the proportion of protein in vegetables is fully equal to what the body requires. If one could eat enough vegetables to get all the nourishment required, there would be protein enough, all the protein he needed. Now, we see that here. You see here we have twice as much protein in dandelion greens as we need. That is why the cow finds in grass the materials to make such splendid food, milk. The rich and highly nutritious milk can be made from grass, because the grass contains a little fat, a large amount of carbohydrate, and a sufficient amount of protein.

And we come down here to the potato. In the potato the carbohydrates are 18.4%, and we find even the potato contains protein enough- ten per cent of its total food value. That is what we require of protein, and there is protein enough in the potato. So we do not have to eat beefsteak in order to get protein enough, because Prof. Chittenden, of Yale, has shown most conclusively that the amount of protein required is only ten per cent of the total ration. He carried out a very lengthy experiment during nine months on more than twenty

men; he measured all the food they ate, every particle of it, and these men all improved in strength and vigor, and some of them who have been invalids, got well. The athletes doubled their strength on this low protein diet, and he proved most conclusively that it is entirely sufficient. So you see with all the rest of the foods here, even squash and tomato have more protein in proportion than the body actually requires. The only trouble with vegetables and fruits is that most of them contain such a large amount of water that we can not eat enough of them to get so much as we ought to have. For example here, in the case of cabbage, the cabbage contains 145 calories in a pound.. Well, how many pounds, then, will one have to eat for a day's rations? Suppose one's ration is 2800 calories,--a large man who requires that much, how many pounds of cabbage would he have to eat? You see we have to multiply this by 20 to get 2800. It would be pretty nearly twenty pounds he would have to eat, about nineteen pounds and a half of cabbage, in order to get enough for a day's rations. That would be half a bushel. That would be more than the average man would care to eat. But when it comes to potato, you see it is a different story. Here is the potato, 385 calories. Now, we multiply this by five, and you see what it will be,--1925,--almost 2000 calories, you see, in five pounds of potatoes. Now, it is quite possible for a person to eat five pounds of potatoes, and two thousand calories is about the proportion required for the average man. I have understood that the hard working Irishman sometimes eats as much as 14 pounds of potatoes, along with his buttermilk, in a day. That would be a pretty large ration. But five pounds would not be so very big. I have seen people who I thought ate at least a pound of beefsteak at a meal. The potato contains a considerable amount of water, and the baking of the potato evaporates quite a little of the water, so that would reduce the bulk somewhat, but one could live on potatoes, you see. It would be a monotonous diet, and he would want to have some fat added to it; but the diet of buttermilk and potatoes, with a little fat, really makes a very good diet. There is protein enough and carbohydrate enough,

and all we need to add is a little fat, and butter or cream will furnish the fat. And one can live well quite a long time on that diet. The potato will decay, but it is not rotten; it does not undergo putrescence; it does not undergo these putrefactive processes that are so horrible. If you should inoculate a beefsteak with the rottenness of the potato, it would not cause decay of the ~~meat~~ beefsteak; but if you should inoculate the potato with the germs of the beefsteak, they would not grow in the fresh potato. It is a different process altogether.

Here we have the sweet potato, 570 calories. It would only require four pounds of sweet potatoes to give one 2200 calories, so one could live on sweet potatoes with a little butter perfectly well, and thrive on it; so there are other vegetables here that contain a very considerable amount of nourishment. It would take ten pounds of carrots, and that would be pretty bulky, but not quite so bad as asparagus which one would have to eat to get 2000 calories, for it would require twenty pounds of asparagus, and that would be a large dose of asparagus, and rather an expensive diet too, if he had to get his asparagus at the Waldorf-Astoria hotel. But the potatoes and other vegetables have the advantage that ~~xxx~~ after they are swallowed into the body they do not decay. They contain such a large amount of carbohydrates that they are protected from decay. That is the reason why the farmer puts his greenstuffs, roots and various sorts of green stuffs into the silo, they do not rot in the silo. They undergo a lactic acid fermentation that makes a sort of yogurt, if you please, for his cattle. A silo is a process of kumyss making; it is a sour milk process. The product of the silo is the buttermilk for the cattle, if you please. The changes which take place in the silo are just as the same as those which take place in making buttermilk. The same kind of germs are developed there. It does not rot or decay, and it does not decay in the intestine. It undergoes the same kind of change, and protects the intestine against the products of putrefaction.

Now, we come to flesh foods, and here we find a very different condition,--an enormous amount of protein and fat, and no carbohydrates. The carbohydrates undergo fermentation which is protective, but they do not undergo decay; but the flesh food is made up of fats and protein in large amount which do undergo changes by which deadly poisons are produced. Some of you know that the Indians of South America dipped their arrows into the blood of a dead animal, and that they killed almost instantly after they penetrated the skin and caused death in a very short time. They dip their arrows into the flesh of ~~some~~ decomposing dead animals, ~~some~~ or dead birds, and that is the way they make them so poisonous. The butcher sometimes in cutting off the meat he is going to send to you to eat, cuts himself and dies of blood poisoning in a week. There are poisons in dead flesh produced by germs which are capable of growing in substances rich in protein, and grow to some extent in fats, but can not grow in carbohydrates. Flesh foods are nourishing it is true; you see they have a very large amount of food value. Tallow has 4000 calories to the pound, but nobody would want to live on tallow. When you come to fish and oysters, they have very little, you see--235, and beefjuice only 115 calories in a pound. An ounce of flour has as much food value in it as a whole pint of beef juice; and beeftea has only about one fourth as much food value as beef juice, so beeftea is practically without value, you see. There is more food value in a teaspoonful of rice than in a pint of beeftea. It is a good thing to know that. There is more actual food value in two tablespoonsful of milk--there is far greater food value than in a pint of beeftea. In five ounces of milk, there is as much food value as in a whole pint of beefjuice. So it is important for us to know some of these things, as they also help us in feeding ourselves and regulating the food of others. Look at porterhouse steak, 1100 calories. Porterhouse steak may be considered as a typical meat food. When you come to the others, they have only about half as much until we come to ham and bacon, and those concentrated, dry

foods, and they have a very large amount. When we come to fish of many sorts, they have only about half as much as beefsteak. Now, look at these nut and nut foods; see their food value. There is hardly one with less than 2000 or 3000 calories, hardly one. Almonds three thousand, almond butter 3300, almond meal 3300, beech nuts 3000, Brazil nuts, 3000; and here are other foods--bromose 2300, butternuts 3100, chestnuts 1800, hickory nuts 3300, malted nuts 2500, nut meal ~~22~~ 3000, nuttolene 844. It is diluted with water in the process of making, so the food value is reduced. Peanuts 2500, pecans 3400, pine nuts, 2800, protose 900. Protose has about the same value, you see, as beefsteak. Walnuts 3285. X

Now you see nuts have on an average three times the food value of meat, so here are vegetable substitutes for meat. If you want to dispense with meat, want to eat something besides meat, here are nuts which will give you all the sustenance, all the calories you can possibly want. I met a gentleman today, a very interesting man, and I think you would find him a very interesting gentleman to meet. He is 62 or 63 years old, a tall man, his hair a little white, but he looks as tough and hardy as an indian. He has a brown skin because he lives outdoors. Thirty-one years ago I first met this gentleman. He was in America on a business trip. His family were an old Belfast family, an old Irish family, that had been engaged for several generations in the lithographing business. His firm was a well known firm throughout the world for their fine lithography, and he was one of the younger members of the firm, had recently married, had some young children coming along and had taken a business trip over to America and incidentally he was looking the country over to find, as he said to me, a place where he could make a little domestic paradise, and raise his children in a place that was sweet and pure and clean, in harmony with what he believed to be natural principles. He had recently discarded meats, and he was very enthusiastic about it. Thirty-five years ago he stopped eating flesh, and his people made great

sport of him, and he wanted to get his children away where he might raise them ~~affairxxxxxx~~ under his own influence entirely. He finally selected a place in California, went into the fruit business, and he has been living out of doors, raised his children in the out door life, and living on nuts and fruits, and he tells me that at the present time he lives entirely on oranges, pecans or some other kind of nuts, raisins, and sometimes a glass of buttermilk; and he finds himself strong and hearty. I dare say there is not a man in this room can keep up with him running, he is so agile. He was just telling me today how in one of his vineyards up on the hill there is a very steep hill, a mountain side, and a long steep run down the mountain side, and another high hill on the other side, and he said, "I am the only man on the place, and have been for a long time, that can run all the way down one hill and all the way up the other." He is strong of limb, his heart is strong, his lungs are splendid. He is a young man yet, and his blood pressure is 105 at 62. I said to myself as I looked at him, "This man is good for another hundred years." Why not? He does not show the first symptom of decay of any of his vital organs; he is in splendid trim, and I do not see any reason in the world why he should not live on just as long as he has lived. He looks young, feels young, and ~~ix~~ acts young; he is living in a natural way. It pays, my friends, it pays; it does one a great deal of good to meet occasionally a man who has tried out a principle for a good long time.

When I was fourteen I became acquainted with these principles of simple living, and I said to myself, "I am going to try it. It looks to me as though it is good; it looks to me as though ~~x~~ it is right, and I am going to try it. I am only one person any way, so I will try the experiment." It is pretty nearly forty-six years now since I adopted these principles, and in all that time I have not eaten a pound ~~xx~~ of meat. Now, I used to prescribe meat for my patients, and thought they had to have it--a certain class of patients, and we used to use several oxen a week here in this institution; and we have found out by our exper-

ience that it was not a good thing; and I finally took a vote of our faculty, and I found not one single dissenting voice in the twenty doctors or more; without the slightest pressure being brought to bear upon them, I found every doctor in the institution said, "Let us cast it out; it does no good; it does harm; we can cure our patients a great deal faster without it"; so we cast it out, and I will give you some of the reasons why we did.

You find in nuts all the original energy that you find in meat; you can find it all in the nuts, the vegetable flesh, and in a pure form,--not filled with germs, no parasites present, no tapeworm, no bacteria, no trichinae such as you get in pork; absolutely, clean and pure, and not subject to the same kind of putrefactive processes that meat is subject to--the very same element. So if you want to get anything you find in beefsteak, feel as though you would like some beefsteak, take a handful of almonds, or a handful of pine nuts, or a few peanuts. A handful of peanuts will give you the very same value you get in a good sized beefsteak. Now, for instance, here, you see the peanut contains 25.8% protein. Now, look here at the flesh foods again,--porterhouse steak, 19%. And here are veal cutlets, and look at chicken, and bacon, and all these other things. There is not a single food upon the chart here that has as much protein as the peanut except dried beef, and the dried beef has more because the water is evaporated out of it.. So if you want to get some protein, you can get it from peanuts better than you can get it from beefsteak; and what is true of the peanut is true of other nuts. They all on an average contain more protein than beefsteak does. So beefsteak is not the only source of protein.

Now, we will consider another subject. I didn't intend to spend so much time on this. I am going to give you very rapidly now a little survey of the reason why we do not allow smoking. I saw a gentleman the other day walking up and down in front of the premises here puffing away at a cigar, and I felt so sorry for him that he had to do it. He doubtless didn't want to do it, but that

cigar had such a power over him that he simply had to obey its orders. You remember what Charles Lamb, the great English wit, said once, perhaps, in his farewell to tobacco. He smoked himself nearly to death, and when he was about to die, his doctor told him he must stop smoking, so he wrote a farewell to tobacco, and the first line of his poem was,

"For thy sake, Tobacco, I
Would do anything but die."

Well, this poor fellow was in about the same fix, and I want to tell you why we object to smoking; so I am going to give you just a few points.

You see that this is a picture of Hudson Maxim. Now, you know he is something of a man, one of the greatest engineers of the time. He has made more marvelous discoveries, perhaps, than any other man alive at the present time except Mr. Edison, and he is a marvelous inventor. You see by his face that he is a genius; he is a man of wealth and can do, can command anything he wants; but I want you to see what he says about smoking.

"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 surely and letting their life's blood out as truly as though their veins and arteries were severed; and that the cigarette is a maker of invalids, criminals and fools--not men--it ought to deter them some. The yellow finger stains is an emblem of deeper degradation and enslavement than the ball and chain." That is, the slavery that binds the man with something he can not stop. The man says, "I can stop if I want to." Then for mercy's sake stop, or stop for your wife's sake. Who likes the smell of a stale cigar? Or of the man that is saturated with tobacco smoke.

Senator Depew relates the following experience of his victory over the cigar. You know who Senator Depew is? I always think of him as the great New York bon vivant, because he was always present at banquets, and on hand at dinners.

He was for many years, as you know, the president of the New York Central Railroad, and a senator from New York.

"I used to smoke twenty cigars a day, and continued it until I became worn out." What wore him out? Smoking twenty cigars a day. It was not hard work for the New York Central Railroad; it wasn't hard work for the government, for he has been notorious for not attending to his duties at Washington; it was hard work smoking,--worn out. "I didn't know what was the matter with my, and physicians that I applied to did not mention tobacco. I used to go to bed at two o'clock in the morning and wake at five or six. I had the appetite and was a dyspeptic." No wonder is it? He ought to be a dyspeptic; he had earned dyspepsia. "One day I bought a cigar and was puffing it with a feeling of pleasure which is only possible to the devotee. I smoked only a few moments, and then took it out of my mouth and looked at it. I said to it: 'My friend and bosom companion, you have always been dearer to me far than gold. To you I have ever been devoted, yet you are the cause of all my ills. The time has come that we must part.' I gazed sadly and longingly at the cigar, then threw it into the street. I had been convinced that tobacco was ruining me. I have never smoked from that day to this; and while no one knows better than I the pleasures to be derived from tobacco, I am still well content to forget them, knowing their effect." He had been convinced that tobacco was ruining him. That is Chauncey Depew,

"40 cigarets a day destroy youth's mind. Sent to Hospital because he wanted to wander naked in the Street. Nerve centers weak. Physician declares patient's mental state is that of little child.", as the result of tobacco. As you take up a newspaper, you can hardly fail to find some account of some poor boy or man who has been killed.

From Press. Columbus, Ohio. "Cigaret killed a babe. Akron, O. A cigaret caused the death of Homer Leslie, aged 8 months, yesterday. The infant

was playing about the yard and found a partially smoked cigaret. He put it in his mouth and chewed it for some time. A little later he was taken violently ill, dying in a few hours. Nicotine poisoning was the cause."

There is enough poison in a cigaret, then, to kill a baby, because it did. I distilled nicotin from a cigaret and killed two frogs with it. Now, it is hard to kill a frog. You can cut a frog's head off, and it will hop around the room if you jar the floor. Many a time when I was a medical student, studying frogs in biology, I cut its head off behind the ears and then chased the frog all around the room simply by tapping the floor; with its head cut off behind its ears it hadn't any brain even, but the body was so alive that it would jump all about the floor. It jumped off the table with its head off. So it is hard to kill a frog. One fourteenth of a drop of nicotin put into the mouth of a frog--I tried this as an experiment about thirty years ago, and I shall never forget how surprised I was to see the effect. I opened the frog's mouth, and put one fourteenth of a drop of nicotin, diluted, into its mouth, and the frog straightened out, made one great croak, then there was a spasm and the frog was dead. Now, you can not kill a frog dead as quick as that by cutting its head off. Cut its head off and it will survive half an hour. Chop it in pieces, and it is still alive; but put one fourteenth of a drop of nicotin down its throat and it will be dead in less than fifteen seconds, just as it killed the baby.

"The Cigaret Trust says cigarets are harmless. Are they? Read and reflect. Fifty to sixty cigarets a day was the average number Frazier Wilson smoked. He was found dead today in the cellar of his home!" "Blind and now insane from cigarets. Frank Ritchie, a merchant of Glen Cove, smoked sometimes 150 a day. Sight first to fail. Warned that total darkness must follow, he could not abandon habit." A Cyclops captured him and carried him off.

"From Evening Telegram, New York." Says cigarets killed his boy.

Frazer Wilson, Librarian of a Brooklyn Sunday School, meets mysterious death in cellar. Great smoker says father. Thinks he was indulging on the sly when death stricken." He didn't intend to be a vicious boy, but he smoked cigarets because he had to smoke. A man who smokes cigars does not smoke so much because he enjoys the cigars always, but because he is so miserable if he doesn't smoke. As Dequincy said of opium, he took it not to give him pleasure, but simply so he should not be miserable. Isn't the man who never smoked, who does not smoke, and who is happy and comfortable and not miserable without tobacco far better off than the man who is miserable if he doesn't have this noxious weed, when the weed is all the time making him more miserable and wretched, and working his certain ruin? Nothing will induce consumption like tobacco. Statistics of the Phipps Institute of Philadelphia, where they treat people for consumption and make post mortem examinations when they die, have a place there for incurables, show that twice as many people who smoke have consumption as of those who do not smoke. Smokers are twice as likely to have consumption as those who do not smoke.

"From North American, Philadelphia. Brothers Killed by Cigaret Smoking. According to the statements of the physicians in attendance, two sons of Joseph Beeman, of this place, died of blood poisoning, the result of cigaret smoking. Fred Beeman, who died last Friday, was 10 years old. His brother, Walter J. Beeman, fourteen years of age, died this morning."

From Evening Journal, New York. "He averaged 75 to 100 cigarets a day. He had smoked so constantly that he did not have the strength or will power left to resist the temptation." "How cigarets affected victim. Smoked 100 cigarets a day. Frequently left classroom to smoke. Became addicted to drink. Brain and body seriously affected. Digestion ruined; can eat no solid food. Leaves post of duty for a spree. Shoots himself in a cab."

"Boy may be insane. Cigarets blamed. Leo Cesano, seventeen years old, smashes windows, removes clothes and is taken to Bellevue.

"Girl Crazyed by cigaret smoking. Mamie King removed from her home in a violent condition. Her reason is despaired of. Young woman kept house for her father and has been victim of habit for years."

"Once More the Cigaret." "Thomas Pierson, a Victim of excessive smoking, taken to Bellevue's Insane Pavilion. Smoked a dozen packs every day. On Tuesday night he broke furniture and showed other evidences of a disordered mind."

Now, I think we must speak out upon this question more often than we have been speaking, because this thing is growing; the cigaret habit is growing. It is invading the ranks of the various strata of society, working up. In Chicago smoking among women is increasing rapidly.

There is a man who was a cigaret smoker. He smoked when he was a boy nine years old, smoked cigars, drank whiskey by and by, and drifted down until when he was forty years old I found him in a gutter in Chicago, and he was looked upon as the most despicable creature in Chicago; he was regarded as the meanest man in all Chicago. He lived in prison half the time. He got his living by hiding away in holes in the wall, and springing out upon a man, putting a knife into him; and he would put a knife into a man for fifty cents any time; didn't hesitate at all, was one of the most ~~an~~ rank and meanest, contemptible criminals I ever heard of. That man was driven to this by tobacco and drink. He tried to kill himself by drink, and he was saturated with whiskey, covered with grime, and filthy, ragged clothes. For seven years I spent every Sunday of my life in Chicago, got a mission going, and have it going yet, and have there a corps of nurses and a doctor who give their whole time in the slums of Chicago in the center of what is known as the Jungle there working for these neglected and ignorant people. This man was one of them. He looked his part. We took him in, gave him a new set of clothes, got him started, and, by the grace of God, he became a new man, and for thirteen years now he has kept himself streight, giving his whole life and time to helping people up. At the present time he has charge

of a large mission in Los Angeles, and if you ever hear him speak, he will touch your heart. He could not read nor write when I found him there. That is what tobacco has done, and it is what reform from tobacco has never done. He is a most useful man.

Here is Thomas A. Edison who has some ideas about tobacco. Here is a poster he put outside his office door one day when he found this thing. "Found near my office door. Some degenerate, retrograding toward the lower animal life has lost his packet. He may have the same by calling on the storekeeper." Signed, "Thos. A. Edison." That is his view of tobacco. Abraham Lincoln said that if he had a boy that would part his hair in the middle and smoke cigarets, he would maul him to death with a squash. Now, employers are finding out that the man who smokes is less efficient than the man who doesn't smoke; that tobacco spoils his brain, lessens efficiency. That has been tested out. Some men were allowed to smoke and then put to setting type, and it was found that a man who smoked made more mistakes in setting type than the man who did not smoke. I once said to Chief Justice Elliott, of the State of Indiana, who was quite a smoker, smoked several cigars a day,--I said to him, "Judge Elliott, can you make a better speech after you have smoked a cigar?" He said, "Why, no. When I am going to make a speech before a jury, I always abstain from smoking. I never think of smoking when I am going to make a speech before a jury. When I smoke I feel as though I can make the best speech I ever made in my life, but, as a matter of fact, I can not do it; I can not make a speech which is so logical, so lucid and so clear when I smoke as I can when I do not smoke; so I never smoke when I am going to make a speech before a jury. The railroad employers are finding it out. "Pittsburg Railways Company. Notice to Employes. April 20, 1907. For the betterment of the service and the safety of the public, it will from this date be the policy of this Company NOT to retain in its employ men who use intoxicating liquors or cigarets."

"I advise every cigaret victim to have his photograph taken every year and put side by side in his room, when he can see the gradual deterioration of himself from year to year. If this does not startle him and bring him to his senses, no preaching will ever do it, for the pictures will be a sermon more eloquent than ever came from any pulpit." Orison Swett Marden.

France more than twenty years ago passed a law prohibiting the use of tobacco by any student attending the public schools. When I was in Switzerland twenty-eight years ago, I found there a law against tobacco smoking so stringent that if a young man less than thirteen years old was found smoking on the streets he was arrested and put into prison, and had to pay a fine, and his people could not get him out until the fine was paid. He was arrested by the police the same as though he had been caught smuggling.

"Dr. William E. Quine, Professor of the principles and practise of medicine and clinical medicine at the College of Physicians and Surgeons, says: 'Whether the cigaret causes imbecility or whether a congenital condition of imbecility leads the individual to the use of the cigaret, I do not know. So far as I am willing to express myself on this subject, I say sincerely that the cigaret and imbecility are related in some way.' That is, in one way or the other. Whether the man who smokes becomes an imbecile because he smokes, or whether he smokes because he is an imbecile,--the professor says he won't say which way it is, but he is sure it is one way or the other. The statistics of insane asylums support this idea very clearly.

"Ninety per cent of those recently rejected by United States examining surgeons were habitual cigaret smokers and had weak hearts." This was published just at the close of the Spanish-American war.

The following recently appeared as an editorial in Hearst's "Chicago American." "Here is a disagreeable death. In the cold routine of daily news there comes a short story from Syracuse. It tells of the death of William S.

Strauss in a hospital in that city. According to the doctors and the facts, Strauss was killed by smoking cigarets. He managed to smoke himself to death in five years, and this in spite of the fact that he was thirty-four years old when he took up the habit. He died at thirty-nine. He died a death of atrocious suffering calling for cigarets when he was too weak to hold them between his lips. A few days before his death, he became paralyzed in his legs and hands and lost the power of speech. He died three days after he was taken to the hospital. He died because with cigarets he had poisoned and destroyed the nerves of his body." Now, why does the cigaret do so much harm? Why?

Here is one of the most useful organs, the liver, a large gland in the right side of the body beneath the lower ribs, weighing three pounds and a half. It has for one of its most important duties the function of destroying poisons. Whether these poisons are generated in the body or taken in from the outside it is a part of the function of the liver to destroy them. Now the liver has work enough to do in destroying the poisons normally produced within our bodies, for the food we eat, especially the protein, is all converted into poison before it leaves our bodies. It is the duty of the liver to deal with this poison, to convert it into less poisonous forms. Uric acid is converted into urea--from uric acid which is very poisonous, to urea which is comparatively harmless and is eliminated. Some poisons are destroyed by the liver, some carried off by the bile, and some are eliminated by the kidneys. Nicotine is a poison with which the liver particularly deals. The liver deals with alkaline poisons, and the kidneys with acid poisons. Nicotine is an alkaline poison. The liver deals with it in particular, and when a man smokes a cigar or cigaret, the first one would kill him dead, just as a small dose of poison will kill a frog, if it were not for the fact that the liver protects him. A man who smokes a cigar takes into his system poison enough to kill two men; and there is enough poison taken in by the average smoker in a day to kill several men. It is only because the liver makes a fight for the man's life. It is taken in in small quantities, and the liver deals

with it as it comes along, so the graduated dose does not destroy his life, but the liver meantime is being worn out. It is like pouring mud or filth through the filter that prepares water for the house--a Pasteur filter. You put ~~into~~ it the cleanest water you can get, but suppose instead you poured into that filter the filth from the barnyard, or sewage from the gutter, suppose you pour that into your filter, how long would the filter remain valuable? The liver is a filter, and nicotine is filth. It is worse than ordinary filth; it is a highly poisonous kind of filth.

Here are other organs, the spleen and pancreas which are associated with the liver in its work. The liver will become worn out by and by in the man who smokes, so the poisons will pass on into the body and then terrible mischiefs occur. This illustrates an experiment that has been made. It has been found, for instance, in experiments made upon the animals from which the liver was excluded so the poisons, instead of going to the liver to be destroyed passed directly into the general circulation so the liver did not do its work in destroying poisons, it is found that half the dose of nicotine will kill the animal under such circumstances. These poisons, then, when the liver gets worn out, pass on and must be dealt with by the thyroid gland, and the thyroid gland is a poison-destroying gland, but it hasn't an infinite capacity; its capacity is limited. Here is a larger view of the same thing, and this gland becomes degenerated, and then the body loses the power to deal with the poisons; ~~xxxx~~ then the kidney which filters the poisons out has to deal with the large ~~xxx~~ amount of poisons which it ought not to have to deal with, poisons that ought to have been destroyed by the liver before they got to the kidney. The kidney undertakes to eliminate them, and is spoiled in the process. So we have Bright's disease, and various other forms of disease, congested kidney, cirrhotic kidney, the big white kidney that results from the chronic poisoning of tobacco. It is found that ten per cent of all tobacco smokers have albumin in the urine, have incipient Bright's disease, without being aware of it, generally. When the Czar of Russia

was found to have Bright's disease some years ago, many of his friends in Paris, business men, became alarmed, and thousands went to the doctors and had examinations made, and a large proportion of these men were found to have incipient Bright's disease, but didn't know it. Bright's disease is a disease that is very insidious, and comes in as a result of these chronic degenerations, taking in poisons; and there is no poison more insidious, active and certain in its effects in producing Bright's disease than Nicotin. It is largely responsible, indeed, for the large increase of Bright's disease which has more than doubled in this country in the last twenty-eight or twenty-nine years. Two hundred and sixty persons in Chicago, for example, are dying of Bright's disease now where 100 died twenty-nine years ago, reckoning the population as the same, in the same proportion. Now, the heart is affected. The poisons not being destroyed by the liver and ~~nk~~ not being eliminated by the midneys, the heart becomes affected, and the heart is particularly affected by nicotin. No athlete who is in training is allowed to smoke. No man in training for a boat race is allowed to smoke. No baseball man is allowed to smoke when he is expected to do his best upon the baseballfield. A good sprinter is never allowed to smoke, because smoking weakens the heart, always, because the poison of tobacco is a heart poison particularly; it paralyzes the heart, and that is why it produces certain death. In 1903 there were smoked in the United States seven billion cigars and three billion cigarets--just think of it. Cigaret smoking is increasing in the United States at the rate of four ~~millixx~~ hundred million a year. Those figures were made in 1904, and now look at the figures for 1908, only five years later, instead of three billions, it was 55 billions. Just think of it, my friends, what an enormous rate of increase of cigaret smoking. It certainly is time something was done to stop this terrible flood of poison which is flooding in upon the world. John Ruskin, the great literary critic, and artist, of England, perhaps the greatest that has lived in modern times, says "Tobacco is the

worst natural curse of modern civilization" He said "natural curse" because it grows out of the earth, I suppose, but certainly it is an unnatural curse, because it was never intended that man should use it.

"I feel a great interest in any effort to check the pernicious habit of tobacco using. It is not only a nuisance, but a moral and physical evil and a shame to our boasted refinement and civilization." The Quaker poet, John G. Whittier said that. He was a man of brains and intelligence, and a man of observation, a man whose judgment, I am sure, has great weight with us.

I thank you for your attention.

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v-6-19-11.

THE ART OF WHOLESOME LIVING

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

Thursday, June 29, 1911, at 8 P.M., By,

J. H. Kellogg, M. D.

I am going to show you a few pictures tonight and try to base a few facts with reference to wholesome living on the pictures I will show you on the screen. The first picture here is the heart, the great central engine of the body. This heart is a very wonderful organ. Did you ever try to make your heart beat slower or to beat faster? Looked at from an anatomical standpoint, the heart is simply a hollow muscle, simply a muscle like the muscle of your arm--a little different sort of muscle, but still it is only a muscle, a hollow muscle that has four cavities in it, two ventricles and two auricles. The auricles receive the blood and the ventricles send out the blood. The venous blood goes to the right auricle, gets to the right ventricle; it is pumped up to the lungs for purification, then goes back to the heart purified, then is pumped out again through the aorta. This great, living pump is not under the control of the human will. If we try to make the heart beat faster, we can not; if we try to make it beat slower we can not; at least we are ordinarily constructed that way. But there was an Englishman some years ago who actually had the power to control his heart, and he went around exhibiting this peculiarity. He could will his heart to go slower and slower until by and by it would stop entirely. He traveled around ~~xxx~~ among the medical colleges exhibiting this peculiarity. One day he stopped his heart and he stopped it a little too long, so he never was able to start it again. That was the end; the exhibition was finished. So you see it is fortunate for us that we are able to control our hearts. It might be equally fortunate if we had as little to do with our stomachs.

The heart goes on working faithfully, beating sixty or seventy times a minute, contracting, and each contraction requires an impulse; it requires a command. Each time the heart contracts, it receives a command from some source giving it the order,--just as when your arm strikes, or your hand strikes, it must receive an order from the mind, the will; so the heart receives an order from the will--not the human will, but from a will, an Intelligence, from the will of the Being that made us. In the presence of this acting heart, working while we sleep as well as while we are awake, we have an example of the presence of the Power that made us still dwelling in our bodies, directing the operations of our bodies. The business of the heart is to pump blood around the body. In the body there are various depots established where nutriment is stored up to be used, ammunition just as the government stores up gun powder in various magazines for use in time of war. For instance, there is a certain amount of explosive material stored up in the muscles, ~~afixkxxxx~~ and every time a muscle works, there is an explosion. There in the muscle there is an explosion, just as much as there was an explosion when the "Maine" was blown up. Every muscular movement is an explosion of energy that has been stored up in the muscle. The same is true of every other organ of the body. In the brain, the stomach, the liver--in every organ of the body that is doing work there is energy material stored up there in the form of glycogen, material which can be converted into energy. And the purpose of the heart is to keep this store of energy good by circulating the blood. The blood is a sort of traveling market which distributes the food which we take into our stomach to digest. If it is good food, well digested, it is taken into our blood and sent around to all these different depots to be deposited for use as we require it.

Take a good look at the heart. Notice these vessels here. Sometimes they become hardened. These vessels bring the energy to the heart so that the heart may be kept at work. The heart gets its energy from the blood just as every other organ does; so when these vessels of the heart become hardened, the

heart can not get its proper energy; then there is serious trouble. That is what is called angina pectoris. There will be dreadful attacks of pain, inability to breathe, shortness of breath, the lips will get blue, and by and by the same thing happens that happened to that Englishman--the heart stops, not because it was willed to stop, but because it is worn out, because the arteries are degenerated. There is nothing in the world that does that so certainly and so frequently as tobacco. Tobacco is the great cause of angina pectoris. One of our greatest literary geniuses, Mark Twain, died of tobacco heart just a few months ago. It was tobacco that killed him. He smoked all day and most all night; smoked cigars ~~xxxxxx~~ all the time, and a pipe between times, so that his heart did not have any rest, didn't have any opportunity. By and by his kidneys got worn out so that they could not eliminate the poison fast enough, the heart degenerated, and the poor man died years and years before his time. There are other things--tea and coffee have a similar effect, and alcohol. All kinds of poisons have a similar effect to damage and destroy the heart.

Now, the heart distributes the blood. Here are some of the things we find in the blood--wonderful cells that are circulating in the blood. When you put a drop of blood under the microscope and look at it, it does not look as it does to the naked eye; it doesn't look red any longer. You will see some little corpuscles there which look very much this color--amber color--red cells they are called; but there are a large number of other cells which are known as white cells. Here they have been colored by coloring matter so as to bring out the different characteristics of different kinds of cells, which proves that we have a number of different kinds of white cells, besides the red cells. We have some larger ones and some smaller ones. These large ones travel about the body and gather up rubbish. That is their function, to gather up worn out and waste matter. You have got a boil perhaps, and there is a little lump left behind. It is the duty of these large cells, the macrophages, as they are called, to creep in there and gnaw away the lump and carry it off. Some years ago when I was a

medical student, nearly forty years ago now, I made an experiment one day, injecting into the veins of a frog some indigo, and the next day I found a lot of these cells just filled with little particles of indigo. It got into the frog's blood--I put it in myself, and they had gathered up these particles of indigo and were carrying them off. That is their business, to carry off rubbish and keep the highway of life clear of obstacles. Here is another kind--small ones, you see, and these have another function. Their duty is to attack living things, not dead things,--parasites, invading organisms, bacteria, malarial parasites, any sort of parasites which may get into the body, living parasites--it is the duty of these white cells, these smaller ones, to pursue them and capture and destroy them. Nobody would ever get over an attack of malaria when he once had an attack, he would never get over it in the world if it were not for these white cells. Quinine would never cure a person of malaria if it were not for the white cells. All the quinine does is to weaken those malarial parasites. It also weakens the white cells to some extent, but weakens the malarial parasites still more, so the white cells are able to capture them. Now, some of you have had the experience of living in a malarious district, and have taken quinine until it didn't do you any more good. The reason it didn't do you any more good was because these malarial parasites ~~xxxx~~got inside of the red corpuscles and ate them up. These white cells pursue the malarial parasites, and they creep into the red cells to hide away, apparatently; it looks that way. Now, when you take quinine the quinine paralyzes these parasites so that they can not flee to the red cells and hide away; but after while they get used to it just as a boy gets used to smoking tobacco, so the quinin does not do them any harm. They get used to it, and then the quinine does not do you any more good. Then there is nothing left for you but to come to the Battle Creek Sanitarium and get well, or go to a mountain top somewhere where you will be out of the malarial district, go somewhere where the anopheles mosquito won't bite you and keep infecting you.

Here are some esinophiles, as they are called, which are very interesting because they are a sort of index. When a person has pneumonia, these esinophiles disappear almost entirely, can scarcely be found at all until after the crisis is passed, or just before the crisis comes; then they come back. So a doctor who is skilled enough to examine the blood carefully can tell whether a patient is going to live or not when he has a very severe attack of pneumonia, by examining the blood. If he finds the esinophiles coming back, then he knows the patient is getting better and will be able to pass through the crisis safely to recovery. Just what they have to do with pneumonia nobody knows; we don't know what their function is. They are ~~wixx~~ peculiar, interesting cells that are being studied by scientists in laboratory investigations in different parts of the world, and though they have been studied for a good many years now, nobody knows what they are for. But we do know these large ones are scavengers that keep the body clean, and these smaller ones are the sentinels that stand on guard, if you please, to protect us against all sorts of germs. This shows some of these cells at work under a microscope. Here is a cell swallowing a germ, you see. A germ came around, and it put out a lip here on one side, and a big lip on the other side, and by and by these lips will come together, and the germ will be inside. The white blood corpuscle is nothing more than a clear, transparent, jelly drop. This shows how they fight the germs as they are going along in the blood vessels. The white ones creep slowly along the wall. They look like loafers. Here are the red cells running down the middle. The white cells accumulate here, you see, opposite the germ. They go creeping along until they get opposite where the germs are, and then they stop, and they just pile up there, creep up and by and by begin to creep through. One of these white cells will put out a little bit of spicule of itself, make a sort of gimlet and bore a hole through the wall of the blood vessel, then gradually creep through, just as you would tuck a pocket handkerchief through a ring; they get through,

get outside the wall, then pursue the parasites. These are some pus germs that have gotten down into the tissues, and these white cells are pursuing them, and they go right straight toward them. They do not have to hunt around to find them; they know where they are and go right to them. They do not wander around and investigate one place then another place, but go right straight toward the germ and capture the germ, swallow the germ inside, and by and by the germ gradually disappears. It is digested, actually eaten up by one of these little creatures called a white blood cell, and each one of these cells is just as much a live creature as a hawk or a blue jay, or a dog or any other creature.

This is the way they look when enlarged still more. You see they have many curious forms, and they have many remarkable characteristics. That is the way they look, healthy germs, that are able to perform these wonderful offices for us; but when they become diseased, as in certain cases of disease, as ~~xxxxxxx~~ in what is known as myelogenous leukemia, for example,--a disease of the blood-making process--the blood is made in the bones, and when this process becomes diseased, these white cells become diseased as you see them here, and unable to perform their functions. The scavengers are no longer able to do their work. The macrophages which destroy the bacteria are no longer able to perform that function for us. Here is another form of disease, of leukemia,--degenerating leucocytes. Here is still another form of leukemia in which we have still a different form of cells in the body. Here is pernicious anemia. Sometimes the blood shows these diseased conditions of the blood cells which are ~~then~~ no longer able to perform this office of protecting the body, because the blood has become diseased. Anemia is one of the most dangerous conditions for one to allow himself to remain in, because when the blood is degenerated, when these defenders of the body are crippled, the self-defense of the body is broken down, and it is open to the attacks of almost any sort of malady. So if one has what is known as anemia, he should get out of it just as quick as he can, just

soon as he possibly can he should get his blood restored. For instance, if when his blood is examined instead of being 100 it is 50, that means he has only 50%, only half the power to defend himself against disease that he ought to have, and he must get that power back again of defending himself, defending his castle, for the defending forces of the citadel have been reduced one half. The citadel is exposed to attack by the enemy. Now, this illustrates how some of these macrophags work. For instance, here is one of them that is fond of coloring matter, and these macrophags, some of them creep up into the hair sometimes while we are sound asleep and steal away the coloring matter from the hair, and the next morning you wake up with gray hair. That happens once in a while. It does not happen quite so fast as that, but the hair sometimes shows a little change over night, and in the course of a few days the hair may become white or gray through being robbed of its coloring matter by these macrophags, these large white cells I have been showing you here. We do not know exactly what the conditions are under which this happens, but they are conditions of deterioration of the body.

Under other conditions, for instance, under the use of alcohol or tobacco, these poisons present in the body, and other poisons have the effect to cause these macrophags to invade the living tissues of the body and destroy them. Here are a lot of them in the muscle cell ^{eating} ~~fixing~~ up the muscle. Instead of attending to their proper business as scavengers, and carrying away rubbish, they are here, as you see, gathered in a muscle fiber and are carrying off that muscle fiber, and that is known as degeneration of the muscle. What is the cause of this? Anything that depreciates the general health, that lowers the vitality will do that. Tobacco, tea, coffee, alcohol, over-eating, auto-intoxication,-- these are the most common causes of this condition. Lead in the water pipes will do that too, lead poisoning, arsenical poisoning, and many other things will do the same thing. Any sort of poison circulating in the blood will lead to this unfortunate effect. Here they are again attacking a nerve cell, you see.

These were actually found in an old dog. That is one reason why a person becomes old and why the memory fails in old age--because these macrophages attack the brain cells. Here was an old lady 100 years old. In examination after death some of her brain cells were being captured by macrophages, because of the degeneration of old age. Here is a kidney that is being attacked. That is what Bright's disease is--simply a condition in which the kidneys are being attacked by these macrophages.

Now, in order to keep these macrophages in order, we must ourselves live rightly. If we deteriorate our bodies by the habitual use of poison, or allow poisons to accumulate in our bodies by auto-intoxication poisons, putrefaction going on in the intestine so that the skin becomes pigmented, the tongue becomes coated, and there is a foul odor in the breath, then these macrophages attack the kidneys, they attack the brain, they attack the nerve tissue, and the muscle--they attack every organ of the body and set up these degenerative processes which lead to premature decay. Now, why don't they do it all the time? Why isn't everybody in this condition? Because we have certain organs which defend us. Here is the liver particularly which is one of our great defenders. Notice the liver is located right under the diaphragm; and the lungs are defenders against these poisons. It is the duty of the lungs to carry off out of the ~~body~~ blood certain poisons, carbonic acid gas and certain volatile poisons formed in the body that escape with the breath. You notice the air of a room has a fusty odor after a number of people have been in it. You have had the experience sometimes of going out into the fresh air from your sleeping room and coming back again, and you have wondered how you stood it. These are volatile poisons that have escaped from the air and have contaminated the air of the room. You know when you put fuel into the stove it burns, and the gas goes out through the chimney. If you put a bushel of potatoes in a stove, it will produce a certain amount of smoke and a certain amount of gas. If you eat those potatoes, the result will be a certain amount of smoke and of poison that is produced when the

potatoes are burned--it is exactly the same thing. The very same amount of poison will be produced, exactly the same sort of poison that is produced in the body and carried off through the lungs. Food is fuel, and what is true of the potato is true of everything we eat. It is burned in the body, and a large part of it goes off through this gaseous poison in the lungs. But suppose we don't use our lungs enough; suppose we allow them to become inactive, and sit about with our shoulders drooping and our chests flat, and the ~~anixxxx~~ lung only acting a half or a quarter what it ought to act, the result will be these poisons will accumulate in the body. That is exactly the situation of the stove when the damper is turned, and the smoke is not allowed to escape up the chimney; it accumulates in the room, the stove smokes, and we can smell the odors all through the house. Now, we know that when we use the lungs which are the great ventilators of the body, carrying off these poisons from the blood in enormous quantities,--why there is three quarters of a pound of charcoal burned in the body and carried off from the lungs in the form of carbonic acid gas every day. That would be quite a little charcoal; three quarters of a pound is burned in the body and escaping from the lungs every day in the form of carbon-dioxid; so there is a lot of this poison. It is very important, then, that the lungs should be made to act properly, and the liver to act properly. The liver is a great poison destroyer which takes care of the poisons produced in our bodies. You know, when you burn coal or wood in a stove, some of it goes off in smoke, some of it is poison, and some of it remains behind in the form of ashes. A good many years ago I visited Jerusalem, and I saw a place where the old temple of the Jews stood, and there had been recently uncovered when I was there a place where there had been formerly underneath where this great altar was where the beasts were burned, sometimes 20,000 beasts were burned on that great altar in one day, so you can see what a wonderful quantity of refuse there must have been. Down underneath the altar there was a large room, and from that room there was a great sewer that went down through the side of the mountain, away off through

the valley down below. Streams of water were brought up there so when animals were burned and the ashes formed on the altar, the ashes were raked down into the room below, then a great torrent of water carried it off down through the sewer. The ashes were washed away in water; they are soluble in water to a large extent.

The very same thing is true in the body. The greater part of it is converted into gaseous poison and goes off in smoke from the lungs, but a certain amount remains behind as ashes; and the same things are left behind when the food is burned, that same material is left behind in the body when it is eaten, when it has gone through the process of assimilation. These alkaline poisons are dealt with by the liver and the kidneys. It is the duty of the liver to render these substances soluble so that they can be carried off through the kidneys which are a flushing arrangement, you see.

This is a most wonderful organ,--the liver. Between the liver and the lungs is the diaphragm. The diaphragm you might call the piston of the pump. The diaphragm moves up and down in this way and so pulls the air into the lungs and pushes it out again as it comes up--goes back and forth. When the diaphragm comes down it enlarges the chest cavity, fills the lungs with air. When it goes up, the air goes out again. It is a sort of double acting pump. When the diaphragm goes down, it squeezes the liver, compresses it and forces the poisons out of ~~xxx~~ the blood, and the blood goes on up through the lungs, to be purified, up to the chest cavity, then back to the heart to be distributed again. And there is something else in the gall-bladder down underneath the liver. The gall-bladder is full of bile. When the diaphragm comes down and compresses the liver and the gall-bladder, it forces the bile out of the gall-bladder, sends it into the intestine so it can find its way out of the body. So the breathing process pumps air into the lungs from above and draws blood up from below. That only happens when we take a deep breath and give the liver a good, hearty squeeze; then the liver is squeezed, compressed and ventilated as well as

the chest. The blood is forced ~~up~~ by, onward, on its way, and the bile is forced out into the intestine, so the liver is freed from its accumulations and is ready for more work.

The pancreas is another organ that has to do with the oxidation or burning processes in the body. The pancreas makes a substance which is carried by the blood to the muscles, and in the muscles this substance acts like a percussion cap to the gun; it is the material which sets off the combustible in the muscle, and enables it to work. So it is very important that the pancreas should be in a healthy state.

Here are the lungs, and the heart between the lungs. It is important for us to know something of the functions of these organs so we can understand something of our duty to ourselves. Here is the heart between the lungs, you see. Now, when the chest cavity is expanded, it dilates the lungs, and at the same time dilates the heart. It draws air into the lungs, and draws blood into the heart; so you see the deep breathing helps the circulation of the blood, helps the heart by sucking blood into the heart. Some years ago I was doing an operation in which I was removing a large tumor under the arm, and the large arteries and veins were grown fast to the tumor so I had to dissect them off, or dissect the tumor off from the large veins. That was a rather delicate operation, and was rather tedious, and I was particularly embarrassed by the fact that every time the patient took a breath, the veins would collapse completely, simply flatten right down flat every time the chest was expanded; so I had to work between breaths the best I could, but it was a most marvelous spectacle, showing that the blood was sucked out of the vein and drawn into the chest at each breath. These are the veins you see here, these enormous veins, and every time the chest expands, these veins flatten. The blood is all drawn out of them into the chest because the veins are drawn toward the heart you see; they are connected with the heart, and it is this suction influence on the heart that draws the blood in from the veins; so deep breathing exercises aid the circulation of the blood. If

you feel that your heart is getting a little weak and your blood is sort of stagnating and you feel somewhat dull and stupid, just go to breathing, take deep breaths a little while, and see how wonderfully it will sweep the cobwebs away from your brain. If a person has a torpid liver or a slow stomach or any sort of chronic ~~xxxx~~ disease--a bad breath, autointoxication,--such a person ought to practice deep breathing all the time, ought just to work at it regularly, systematically. You say you could not do that. I remember a man who came to the institution here 35 years ago. I examined him and found he had consumption, and I said to his wife, "Mrs. Thompkins, I am afraid your husband has not more than one chance in a hundred to recover; I think you better take him home right away." He was so feeble I was afraid he would die on our hands. I had just taken charge of this institution as superintendent, and I never expected to allow anybody to die here. I expected to cure them all up or get them home in proper season, and I didn't want to have that man die here, and had not then had any deaths. And I said to his wife, "You better take him home in a day or two." That man came down to my office the next morning looking fierce. He fairly glared at me. "What have you been saying to my wife, sir?" "I only had a little talk with her;" I said. "Now, look here, no prevaricating. You told my wife to take me home, you told her that there was not one chance in a hundred for me to get well. Now, I don't want to hear any such discouraging talk as that. I don't ask anything of you but simply to tell me what to do. I am going to get well; that is all there is about it. I don't want you to do anything at all but tell me what to do. You need not be talking to my wife any more; I have hard enough work now to keep her courage up, and I don't want to be discouraged any more." He made me feel very small indeed. I said, "All right, you take the responsibility of it, I will tell you what to do." So I said, "Here is one thing to do; you put a cane behind your arms like that so as to get your shoulders back." He was a Presbyterian clergyman, he was very flat chested, had been a student and hadn't given any attention at all to cultivating his physique, and

he was in very bad shape. I told him to put a cane behind his arms so as to keep his shoulders back, and then take deep breaths, just as deep as he could breathe, and then I told him to walk in the open air. So I could look out my window almost any time between sunrise and sunset and see that man walking up and down the sidewalk here with his arms pinioned in that way, with his chest well out, walking up and down with a soldierly stride, chest high, taking deep breaths, and making a business of walking up to health; and he did it. His temperature which was $103\frac{1}{2}$ when he came, in three months came down to normal; his pulse was 120, but got down to ~~max~~ 70. His cough had almost entirely disappeared. There was a big cavity in his chest but it appeared to be healing, and he went away, and for years and years and years he used to write me, and always signed his name, "George Thompkins, E. C." The first time he put in a footnote saying "E.C. means ex consumptive." He was just making sport of me, don't you see? He wanted to remind me that he got well in spite of me. Now, it was that man's deep breathing that helped him more than anything else that was done for him. He followed the instruction I gave him to breathe deep. The average patient doesn't do what we tell him to do. There isn't one patient in a hundred who does what we tell him to do. He thinks it is not worth while, he seems like Naaman, don't you know?-- the heathen ruler that went to the great prophet in the olden time and had the leprosy, and the prophet told him to go down and dip seven times in Jordan. And he said, "Why, haven't I got better rivers than Jordan at home?" If it was simply taking a bath, he could do it at home. But he finally relented and went back and dipped seven times in Jordan, and was healed. ~~xxxxxx~~ It was so simple he didn't think it worth while to believe it. That is the way so many people are.

I want to tell you, my friends, I don't know a thing that is more worth while for you to attend to than that one thing, deep breathing, because that is the thing that strikes right at the root of things. It helps your heart, it helps

your lungs, it helps your liver, it helps your slow stomach and bowels; it helps the stomach to get the food out of it and get it on, so it is of immense advantage, and when you help the heart, you help everything in the body you see, because the heart is the great central organ, the central engine that distributes the energy throughout the body and keeps the whole machinery going; so I want to tell you that deep breathing is worth more to you than anything else I know of, if you will attend to it and work at it systematically. Now, let us all take five deep breaths altogether so as to know how to do it and get started. I see somebody over there getting the shoulders up in this way. That is not the way to do it. When you want to fill a bottle you begin at the bottom. So we want to begin filling the chest at the bottom. The first thing we want to do is to pull down the diaphragm. The waist should expand here at the sides. I hear some of these ladies over here saying they wish they could but they can't. There is a good reason why they can't. There's a reason, as the newspapers sometimes say, for that. You know if a lady faints away in church--if somebody faints away in church, it is always a woman. And when somebody goes down there to help her out, the very first thing you hear is a hoarse whisper, "Cut her corset strings." Now, then, when a man faints away in church, if a man ever did, you never heard such a thing as a man suggesting, "Rip up the back of his vest quick." His vest is not so tight that he can not breathe. But everybody knows when a woman faints away, ~~xxxx~~ just what the matter is. The smallest boy in the room knows right away just what ought to be done. Certainly all the women know, because the first thing they do is to go tearing away at her clothes to loosen up something so she can move her lungs. Just think of living all the time in a way that you can not move your lungs. Just think what a fashion that is,--that women must compress their lungs until they can not half use them. Suppose you happened to get up sometime on a cold, winter morning, had to go back in the days when they had to use the bellows to start the fire. You get up on a cold, frosty, morning, and you find somebody has tied the handles of the bellows

together and you can not get the handles untied, and you get hold of the belly of the bellows and try to wrench the sides apart a little bit so you can get in a little air and start the fire going. The trachea here is the nozzle of the bellows, and the chest is the bellows, and the ribs are the handles of the bellows, and when there is a belt around the waist it ties the handles here so they can not work the bellows. When the handles are tied up here, the only way in the world to work that bellows is to work the belly you see. That is why the ladies always pull up their shoulders to take in a deep breath, to draw in a little air at the top. Now, we must have room. That is why we have gymnasium exercises; that is why we have the outdoor gymnasium, and the manual swedish movements. Every patient that comes here nearly ought to have the manual Swedish movements. And you all, every one of you, ought to be in the gymnasium taking those breathing exercises. I look in there sometimes, and I feel almost heart sick to see so few of our people availing themselves of these great resources to set the vital machinery of the body to going. You say, "Oh, that is a trifle." So it is, but it is one thing, and the idea is to have a lot of things to help the sick man. We start him off first thing in the morning with something to help him, and the next half hour we have something else, and the next half hour something else, the next half hour something else; and every half hour all day long, giving him a little lift in the right direction. When I was climbing up Vesuvius some years ago I remember how comfortable it felt when a couple of sturdy Italians-- it was an awfully hot day in May, the sun blazing down on us, and the mountain side steep and all covered with ashes which were hot, and one slipped down just about as far as he climbed up at each step. I shall never forget how comfortable it was when a couple of stout Italians came along and gave me a little boost. It was very comfortable, but I resisted the temptation, and insisted that I should climb up by myself which I did. But I said to myself that is what we have to do with sick people at Battle Creek. But I am not sick, so I don't

need such help. We have to boost them, and that is what all these helps are for. You have got to do the climbing yourself, you see. The treatments help and everything helps, the whole program, and you can not afford to drop out one thing; so that morning walk that sets the heart and the muscles to going is of tremendous advantage. It helps circulate the blood so that it travels around and reaches the kidneys and the kidneys get a chance to purify it, you see. When the heart gets to going with great vigor, the kidneys get twice as much blood, and they can purify twice as much blood, you see, and when you get rid of that poison, it stops the arteriosclerosis that is going on, spoiling the arteries; it relieves the awful congestion of your brain as the result of brain poisoning; it carries off some of the ~~xx~~ poisons that are irritating your nerves and make you neurasthenic. So if you do not give the kidneys a good chance, the poisons become concentrated in the kidney until the poisons ~~xxxx~~ all go to the kidney until the secretion of the kidneys is almost like lye, irritating the bladder, setting up disease of the bladder, poisoning the kidneys themselves until degeneration takes place and we get fatty kidney, or cirrhotic kidney, or congested kidney, or some other form of disease.

Here is a diseased kidney. Here are the little tubules through which the poison is carried off, and if they are obstructed, stopped up, then the kidney loses its power to do its work. The same thing happens to the liver. The liver instead of being able to filter out the poisons of the blood, the blood stagnates in the liver, and the poisons remain in the blood, and then you have what is called torpid liver, and stagnation of the blood. That is a very common thing in sedentary people. Ladies who spend much time sitting in rocking chairs and ~~by~~ allowing the whole abdominal wall to become collapsed so the abdominal wall is soft like cloth, and you can just put your hand in here. The abdominal wall wants to be tense so you can give it a blow and it feels like a drum when you strike it. This tense condition of the abdominal wall supports the blood vessels and prevents the congestion that comes. If you have a sponge

in water and relax your hands it fills with water. It is exactly so with the liver. When the abdominal wall here is contracted, the ~~xxx~~ circulation is kept moving; but when it is relaxed, when the abdominal muscles are soft and flabby the liver fills up with blood, the blood stagnates there in all these regions; the heart gets congested, the bowels get congested, and you get catarrh of the stomach, or catarrh of the intestines, or catarrh of the liver or of the gallbladder, or stones in the gall-bladder. I saw a man today who had four big stones in the gall-bladder, stones about as big as large filberts. We could see them with the X ray in his gall-bladder, and he has fearful attacks of pain that come about by auto-intoxication. When I saw his tongue I was not surprised to see it was very heavily coated, a miserable, brown, yellow color, and a bad odor in his breath. That is what made these gallstones. If he had cultivated deep breathing, the probability is he would not have had that trouble, because he would have kept his liver cleared out. There would not have been the stagnation which resulted in the formation of cholesterol and the formation of gallstones.

Here are some healthy liver cells, and here are some diseased cells filled with fat. The liver has been changed to fat and it cannot do its work. That is the result of this chronic poisoning that comes from inactivity. By and by the liver becomes cirrhotic, especially if one uses alcohol, mustard, pepper, pepper-sauce, ginger, horseradish and things of that kind,--these are the things that make drunkard's liver. There are more people intoxicated with mustard, pepper, and peppersauce than there are intoxicated with alcohol,--a great many more. And Prof. Voix, of Paris made a careful study of the subject, and he found that pepper has six times the power to make gin liver that gin has, because pepper is far more poisonous to the liver than gin is. He found the same thing true of acetic acid which is twice as poisonous to the liver as pure alcohol is. That is ~~xxxx~~ why vinegar is so harmful. Vinegar is a poison, is not a food. It never ought to be added to food. We have pure food laws prohibiting the use of various preservatives in food, so some pickle makers have substituted condiments

of various sorts, pepper, vinegar, and spices of various sorts which do the body a great deal more harm than the preservatives that were formerly in use; so there isn't any advantage in using the pure kind so long as they have got these spices of various sorts in. The thing is to dismiss them all.

Here is a liver that is completely wrecked. See these great nodules of cancer. I examined a patient just three or four days ago that had this terrible state of the liver, three or four times as large as it ought to be, as a result of the growth of cancer in it. Now, one of the best remedies for all these troubles I have been telling you about is exercise, the outdoor life. That is why we have the outdoor gymnasium here, and that is why we are building another one over here. I consider the outdoor gymnasium one of our most important and valuable adjuncts. The things you get in the outdoor gymnasium are just as important as anything we have in this establishment; I assure you so. I would give--I would be glad to pay as much as any person in this house is paying for board and treatment here, for the privilege of spending two hours a day in the outdoor gymnasium. I would be tickled to do it, because I know it would give me some years of life; but I have to work all day in order that you can play and have a good time, and I am glad to do it for the benefit of my fellow men who need just such advantages more than I do. But I know it would add years to my life. I have had to live indoors all my life time, and I don't expect to live out half my days because of it; but it is an unnatural life, an artificial life altogether. We are naturally outdoor creatures, and we can not live this artificial life without suffering in consequence. Take a horse and shut him up in a stable, keep him there, and how long would you expect him to live and remain a healthy horse? Yet a man will treat himself worse than ~~that~~ he ever thinks of treating his horse. If he has a fine horse, he has a man to take him out to exercise him every day, groom him, rub him, fix him up every day, give him fine food. Yet the man needs exercise worse than the horse does; he needs regulation of his diet a great deal more than the horse does, for the horse has horse sense

and he can regulate his own diet, knows just what to eat and won't eat anything else than what he ought to eat, while the man has lost his horse sense so he needs a regulator. How strange it is we do not apply common sense principles of hygiene to ourselves when we apply them to our birds, horses, cattle, pigs, chickens, monkeys and everything else we have under our care except ourselves and our boys and girls, and our wives and friends; them we utterly ignore. These things are of so much consequence. A man down in New York some time ago met a friend of his at his house, and he noticed the friend had four beautiful dogs, and had a couple of splendid boys. He noticed his friend gave his attention to those four dogs, looked after the kennels, looked after their food, took them out for exercise every day, and had a tutor for the boys. He asked his friend, "How is it that you give your personal attention to your dogs and hire a tutor for your boys?" "Oh," he said, "my dogs have a pedigree, don't you know?" He was interested in keeping up the pedigree, you see. It would be a good thing if we gave more attention to family pedigrees. The time will come when we will have an aristocracy that will beat all the blue blooded aristocracies of Europe you ever heard of. We will have an aristocracy of health, and no young woman will marry a man without knowing something about his health and his ancestry, and if a young man is going to marry a young woman, he will ~~fix~~ want to know something about her pedigree too, want to know what is likely to come along that line into the family. There may be epilepsy, there may be insanity or worse things than that, even, coming along down that line. We don't know. It is strange how we ignore things of that sort. I am doing my best to get passed in Michigan a law that will not permit young people to be married without a searching investigation upon certain questions of the sort I have mentioned to you. That time will certainly come--when it will be illegal for marriages to be contracted without such an inquiry. Some people know enough to give attention to these things; that is, after while they learn enough, get wise enough to do it. A friend of mine, that I know very well, some years ago found himself

completely broken down, could not get life insurance, and he began to think, "what can I do, what can I do? I must do something, for I do not want to leave my family in bad shape." "I must do something to improve myself if I can." He had retired from business, was a man about fifty years old, and began to think what he could do. He said, "There is one thing I can do; I can chew; I can do that much anyhow"; and he began to study chewing, and finally learned to chew; and he discovered after he learned to chew, his gustatory sense, the sense of taste selected his food; that when he had eaten enough of certain things, his sense of taste told him not to eat any more. He very soon discovered there was a monitor located here in his gustatory nerves which notified him what to eat, informed him all about it; he did not need a professor of dietetics to sit at his elbow and instruct him; if he only chewed enough, his gustatory sense of taste would tell him. If he needed carbohydrates it would tell him he needed carbohydrates, and he would have a relish for them. He made such marvelous improvement that in a few years he was able to get all the life insurance he wanted. I have the pleasure of introducing the picture of Mr. Horace Fletcher. That is the way I saw him. You would not recognize him, perhaps, but you will remember that picture, I am sure. You see everybody is surprised to see an old man sixty years old making a high dive of that sort, and turning a summersault in the air, as nimble as any of these boys could do it. There he is. He is a man who made himself young again after he was fifty years old, by paying attention to some simple things--chewing, giving attention to the mastication of his food. The most of you sit down at the table and swallow things miscellaneously without giving proper attention to mastication. If you haven't time to chew don't eat. But if you must eat, take something simple like fruit, something that does not require very much digestion. Take pains to chew it well.

By the way, a great many people think they can not eat fruit, the the reason why they can not is because they do not chew it properly. Apples and

fruits of that kind must be chewed very thoroughly, otherwise they won't get out of the stomach, because the pylorus refuses to let things through that are not reduced to a liquid, pulpy state. So if you swallow a lump of anything, it will stop in the pylorus, stay in the stomach for hours when it ought to get out of the stomach in the course of a few minutes.

Here are some other things going on in the outdoor gymnasium. Here is the sandpile. Perhaps some of you have forgotten how delighted you used to be when you played in the sandpile when you were boys and girls. That is one way to get younger. We came out of the ground, and we are going back into the ground. The ground is the great mother of us all. "Dust thou art and unto dust shalt thou return" is the fiat of the Almighty. Somehow we are akin to dust, and the coming close to Mother Earth, the contact with the soil has certain benefits in it that we can not afford to forego, especially when we are making a business of seeking health.

Here is the outdoor swimming pool. You ought to have a dip in it every day. Get out there and rest in the sun. I talked to a man today about that and he looked surprised; so I told him the story of a woman who took three little boys to a French physician some years ago and said to him, "My dear sir, what shall I do for these poor children of mine?" He looked at them and in a very fierce tone of voice he said, "Roast them, Madam, roast them--in the sun." So she took those boys away and roasted them and they all recovered. That is what most chronic invalids need--is roasting. We doctors get roasted very often in our offices; but the patients need the roasting worse than the doctors do.

A good friend of ours, Mr. S. S. McClure, came here very much broken down--the proprietor of McClure's magazine, and he thought the outdoor gymnasium did him more good than anything else. He was down there every day just the moment he could get in there, and he stayed till the last minute, and when he came out he did hate to put his clothes on and dress up again; and he would generally

go up to his room and pull them off again so he could live as much as possible in the fresh, open air. It was simply marvelous the way he came up. He became a new man in the course of a few months, and it was worth a great deal to him to save his business. We are building across the road a much larger pool, 100 feet long by 35 feet wide. We shall have all sorts of appliances there for making people well and getting close to nature.

I want to call your attention to that little prescription booklet the doctor gave you and that you have not read yet. There is not a line there but you ought to give attention to. Please read every line of it. I have been thinking of having classes here, taking our new people that come, putting these books in their hands, and the next day have a class and let it recite a part of it to see if they have read it. Look over your program to see if it is full enough. See that you have everything that is going. This institution has a great many advantages and facilities, and sometimes people stay some little time and say "Why didn't you tell me about that thing before? It has done me so much good, but I have just found it out." Look this book all through, and you will find these things mentioned. Perhaps your doctor is afraid to give you too much for fear you ~~won't~~ won't want it. But you get everything you can out of this institution. You have a precious opportunity while you are here. If I had chronic stomach trouble, the very first thing I should want would be to have an X ray examination of it to find out how big the stomach is, where it is, and how it was behaving. We are going to show you a moving picture of the stomach digesting food one of these days, and you can see what the X ray man sees when he looks through that wonderful revealer of secrets.

Get your doctor to give you a program for the whole week so you will know exactly what you are going to do, and when, and just put in all your energies, all your time, and all your enthusiasm into this work of getting just as well as you can get. I was talking with a man today about diet, a man who is in good health, and he came to see us from a representative college, a large institution.

Mr. Booker Washington was here last spring and gave us a lecture, and he became interested in what we are doing here, and he told the folks at Tuskegee, and there was a tremendous enthusiasm to adopt Battle Creek ideas, and he wrote me that he had a petition signed by 65 of his teachers asking him to give them a table without any meat; so he established a table, and the table grew until in a short time there were 100 people eating no meat; and now they have sent the dean of their theological department, a very cultivated gentleman, up here to learn more about dietetics so they can do the thing scientifically, and they propose to teach the Battle Creek principles at the Tuskegee Institute hereafter, and to teach those colored people down there how they can get forty times as much for their labor as they are now getting; for when the farmer sows his corn and takes care of it, harvests it, feeds that corn to pigs, then eats the pigs, he gets only one part in forty of the food value there was in that corn, and throws away thirty-nine parts of it. It is very easy to show that to you. You can get forty times as much food out of the land if you take it first hand as if you take it second hand. The farmer out west has 160 acres of land, and he raises corn enough on it to support 200 pigs, feeds it to the pigs, and the next year he has got to plant his 160 acres again, and cultivate it, to find food enough to keep him going the next year, with 200 pigs. If he ate that corn himself, fed it to his family, he would have enough to feed himself and his wife and family of three children and twenty chickens for 100 years. But it is all eaten up in one year by his 200 pigs. If he ate that corn himself it would last that length of time, but it is all eaten up in one year by his 200 pigs. So you see it is the fundamental thing that has got to be done if we ever have any economic reform. Prices will go right on forever rising unless we change about, stop this destruction of so much property by artificial and abnormal kinds of food. The thing that keeps America poor today, that keeps the American farmer poor is the American hog. He is eating up the wealth of the country. If you will take time to inquire into that matter a little closer, you see that is really the fact.

Here are some diet lists, quite a variety of them. If you are not using malt honey and malt sugar, you ought to be because they are the most fattening foods you have on the table. Don't forget to count your calories. How many of you are doing that? Now, I am going to have a special reception for the people that count their calories one of these days, ~~xxxx~~ and we will have favors too, have something interesting, and people that won't count the calories--I don't know whatever will become of them. Count your calories. That is one of the best means I know of of studying dietetics. Get a little blue book at the stand for a few cents, the Battle Creek Sanitarium Diet list, take it home and educate your neighbors. Put down the calories today, show it to your doctor, and say, "Am I eating enough?" A lady complained some little time ago because she was not getting fat, had not gained an ounce, and really thought she had lost some. On inquiry I found she was eating 800 calories a day, and needed 1800. She was a thousand calories short. How could she expect to fat up when she was taking a thousand calories less than she ought to eat? This thing is scientific. We have been at great pains and very large expense; we are maintaining here a retinue of cooks, dietitians and scientific, trained people who can cook the food and serve the food with all the ~~xxxx~~ accuracy with which the pharmacist prepares, compounds and hands out medicines. I want you to get the benefit of it. There is not another place in the world where you can get such advantages as you can get here in this dietetic way. I was talking with a scientist in Boston who is employed by the Carnegie institution to make investigations in matters of nutrition. He said to me, "Doctor, if the Battle Creek Sanitarium was within twenty miles of Boston, I should be over there two or three times every week, because your institution is the only place in the world where food is served scientifically so that it would be possible to conduct a really accurate and exact scientific research. Dr. Benedict is coming out here next fall for that very purpose--to start a great, scientific research here; because we know what

we feed people, and it is the only place in the world where it can be ascertained accurately what people eat and the value of the ~~xxxx~~ foodstuffs that they consume. Be sure your full program is made out, and that you are living up to all your privileges. Here is the mechanical Swedish movements--get out of that the greatest value you can. The vibrating applications have wonderful power to wake up the sluggish nerve centers. We found out some little time ago that this vibrating chair will actually cure seasickness. That has been the despair of the doctors for centuries, what to do for seasickness. It is found that the use of the vibrating chair will cure seasickness, and one of the great steamship lines has put these vibrating chairs on their ships so people can have the benefit of them for relief from seasickness. It relieves this miserable pain in the back of the neck and neurasthenic sensations. Go down and get shaken up in the vibrating chair and see how it will wake things up.

Don't forget to read the suggestions and rules for exercise and the different hydriatic appliances. If you get tired of your program, go to the doctor and ask for a change. We can do the same thing in half a dozen different ways. So if you want a change, ask for it. The doctor can give you something else that will do just the same thing in another way, and the variety may be helpful to you. Read all these suggestions through carefully. They are prepared with a great deal of care, and based upon the experience of forty years with thousands and thousands of invalids; so here are some things it would be worth while for you to get.

Now, then, if we could only live as close to Nature as those lillies do, we would be just as sweet. A baby is just as sweet as a flower; but as we grow old we get to be wretched and miserable, get a bad breath instead of a sweet breath, get dingy and ~~xxxxxx~~ tawny, and we let ourselves go to pieces. I tell you, my friends, it is worth while, worth while to give attention to things

that are good and natural. Let us live close to nature. That is what you come here for; that is what Providence sent you here for--to learn how to live; and while you are here learning, don't forget it is not simply while you are here, but after you go home you are to keep right on in the same good way of living.

v-7-5-11.