S T E R E O P T I C O N L E C T U R E S .

THE HOUSE WE LIVE IN. July 13,1893.

J. H. Kellogg, M. D.

--o0o--

Ladies and Gentlemen : I am glad to meet you here to-night. I am going to talk to you a little while about the house we live in. This body of ours is the most wonderful thing in the world. Some people evidently don't believe that . If some one should make you a present of a watch or a jewel of some sort, you would have a nice case made for it, and you would keep it under lock and key, and perhaps you would wear it as a little locket next your heart, where it would be safe. You would take the most excellent care of it. If a person should receive a present of that kind, and should toss it upon the floor and kick it about, you would say he was almost committing sacrilege. Now this body is the most beautiful and delicate piece of work that was ever constructed. It is more beautiful than the most precious gem you ever saw . Some years ago, I was visiting the art galleries in Rome, and I went from one gallery to another, and from one church to another, and examined the paintings and the marvelous statuary with great pleasure. By and by the guide brought me into a church which was in a remote and almost inaccessible place, where but few people except travelers would be likely to find their way. I found scarcely a worshiper in it, and after going through some very obscure passages the guide at length brought me around to the farthest corner of the church, and there was a little niche in the wall and a window opposite, but there was a curtain over it, so that nearly all the light was shut out. Everything in the church was made as

dark as possible, and one could hardly see. When we got opposite this niche in the wall, the guide pulled up the curtain which hung over the window, and also suddenly raised the curtain that covered the niche in the wall and disclosed a most magnificent painting ,-- the grandest painting that I ever saw. It was Michael Angelo's masterpiece. You have doubtless heard of the painting called Michael Angelo's Moses. Well, there it was ! The tracing of that picture was so clear, distinct and life-like, that one could almost imagine that it was going to speak. I never saw anything that inspired me with such respect for genius as did that picture, and as I stood there and looked at it, I said to myself, People come to this shrine of art from all parts of the world, and they almost bow down and worship the genius that could make a picture that looked so like a man. Now, if some Vandal should come here and throw dirt upon this picture, or in any manner mar or deface it, the whole civilized world would cry out in execration at such sacrilegious acts. Well, I thought to myself, How do people treat their bodies? This painting is but a shadow, a little paint worked on canvas in a way to imitate a man's face; it is a shadow of a man, an imaginary man. Michael Angelo never saw Moses. This painting was simply Michael Angelo's idea of Moses, but it was that thought, it was that idea, and the genius that was able to image that idea upon canvas,— it is that that men worship; it is that that men do homage to , and there are thousands of people who make a pilgrimage to that church every year just to see Angelo's Moses. Now, I said to myself, it is because this picture is the highest achievement of art, that people esteem it so highly. It is not the real Moses, but it is a painting very like the real Moses. Now, here is a real man; it is a human being; it is the Almighty's masterpiece. It is not a shadow; it is not man's

masterpiece; it is not a shadow, but a real thing, and yet how little regard many people pay to it, and how little care they take of it. Every man is the embodyment of the masterpiece of the Almighty, but how reckless people are of this masterpiece . If some one should break off a finger, or a piece of an ear or of the nose of a beautiful piece of statuary, you would say he was a ruffian. Civilized people don't treat the body like that, although it is said that a party of surveyors while out west among some of the Indians there, found that they were in the habit of cutting off and exchanging pieces of their fingers, and they carried them as pocket pieces, remembrancers, precious mementos. They didn't think anything at all about cutting off and exchanging fingers, which would not be a dangerous thing to do in that healthy atmosphere and their simple dietary, and so this is a custom with them. A custom of this kind is recorded, I think in the government Reports of 1812. We do not see people in civilized communities who cut off portions of the external body, but in regard to the internal body, they are very reckless. They will punch holes into their stomachs by the things which they put into them. For instance, they will put into their stomachs enough mustard to make a good sized mustard plaster without any compunctions of conscience. In this way we see people cutting off great chunks of their livers, and in other ways abusing their lungs; and the whole interior portion of the body is abused by men and women who take the greatest care of their outside body. Now I am going to show you a few pictures which will ~~give~~ you a better idea of the body, and the necessity of taking proper care of it . (Lights out.)

Teeth Here we have a representation of the teeth. We will begin with the teeth, as I suppose they are the most interesting por-

tion of the body to some of you; you can't eat very well without teeth. Good sound teeth are necessary for sufficient mastication, hence necessary for health. One has no conception of the structure of the teeth until he looks inside of them with a microscope. We often think they are a homely structure; that we have no other structure so homely, but on looking into them with the microscope we find them full of beauty on the inside. In the first place the tooth has a cavity inside, and in that cavity are blood-vessels and nerves which nourish the teeth. Then you can see these little nerves running out from this cavity. They are too small for blood vessels, but they are large enough for the serum of the blood to circulate in and to carry nutrition to the bones. On the outside of the teeth there is a shell or enamel which consists of hexagonal prisms or plates of enamel, little plates laid together like a pavement. The whole tooth is covered with this pavement of enamel, covering it and protecting it from corrosive substances. Now notice the different kinds of teeth we have in each jaw: here are two incisor or cutting teeth, --two above and two below. Here are the two "canine teeth", so called (they are not canine teeth, however). Here are two small molar teeth, and two large molar teeth (grinding teeth), and the two wisdom teeth. Now there is a gradual transition from the chisel shaped teeth to the rounded molars behind. Here are the teeth with points; first we have the cuspids, then the bicuspids and the tricuspids , the teeth being arranged like a modern harrow. First, the incisors for cutting food into chunks, then the Canine ~~chisel~~ shaped teeth for splitting them in two; then grinding teeth small and large molars the canine teeth, as they are called, are longer than the others. (Lights out.) Here are the teeth in place in the jaw. This is the skull of a man who expired long ago . Look at these teeth which are called "canine teeth." They are not canine teeth ;

they are human teeth. It has been claimed that man has canine teeth, and therefore he belongs to the class of of animals called carnivorous or flesh-eating; but these are not carnivorous teeth; there are no such teeth in a man's head.

Here is an illustration of a section of a bone. The bones are wonderfully interesting structures when seen through a microscope. This is an illustration, for example, of what you would see if you should look at a thin piece of bone through a microscope . This was taken from the long bone of an ox and ground down till it is very thin. It is a transverse section of bone, and it is ground down so thin that you can see through it . Examine it with a microscope and you will see that it has holes and the blood runs in these holes. These are the veins of the bones. Here you see a longitudinal section of a bone. These spaces here are the veins of the bones. Lying outside of these are black spots with arms radiating from them. These are small caves in the bones, and there is a little creature living in each of them, and it sends out arms to take hold of other little creatures. In that way the different cells of the bone are all joined from one end of the bone to the other, because each end of the bone attaches to the other ./

Here are the different parts of a skeleton. Here iis the thorax, a bony cage. Here is the pelvis, another bony cage. Here is the spinal column, so arranged with cartilages that the head will not receive jars. When a man jumps up and down, by this arrangement there is no shock, to his head and his brain is not injured. By these curves in the spinal column , it acts like a spring and prevents a shock to the head when the man jumps up and strikes on his heels ; all these blows that are struck from be-

low are refracted off; the force of the blow struck below is some of it thrown off here, and some here (referring to spinal column) and so on until it reaches the head, when the force is but small in proportion to that which struck the other extremity of the skeleton.

Here you see two ends of bones coming together. They are covered with cartilage. This is the knee joint, the patella or knee-cap. Here is where the "joint-water" is ~~located~~ secreted. This is the synovial fluid, and lubricates the joints. It is the most perfect of all lubricants. The joint does not secrete this fluid unless it is in operation. This is a most wonderful thing; if the joint is not in operation, there is no joint water secreted, and then the joint is dry, and creaky. Sometimes the synovial fluid is secreted too freely, and a false cartilage will sometimes be formed. A short time since, I knew a man who was suffering from a difficulty in his joints and used plaster casts. When he was walking along, something would suddenly lock his joints so that he could not stir, and he would have to stop. After a while his joints would unlock and he would walk along. He told me that it was a sort of trip; that it was like having some man put a lock upon each knee and lock it. On manipulating his joints, I found something loose there. Upon further examination, I found there was a loose cartilage about as large as my thumb, and upon cutting that out the difficulty in walking was removed; it was cured in about five minutes. This is a very curious illustration of the manner in which things sometimes go wrong in the body.

Here is a splendid specimen of a man. Here we have represented all the muscles of the body,--of the arm. Here are represented in sight only a small proportion of the five hundred muscles

eles whic constitute the whole muscular system.--

Q. There are some who believe that the joint-water some-times runs out, and the joint becomes stiffened. What is the fact about that ?

A. There is no accumulation of joint-water. There is only enough secreted to moisten the joints . There is no accumulation of joint-water, consequently there is nothing left to run out when the joint is open ,--except when the joint is diseased. However, opening the joint is a very serious matter, because of the possibility of germs getting in; there might then be an absorption of pus in the bones and the body, and great mischief might result. In the case about which I have just been telling you, I took pains to prevent the admission of germs during the operation.

Here we have a representation of the back part of the body. Here are the large muscles attached to the spine and running up here; here they are attached to the arm so as to pull it downward and upward . Here is a large muscle (the trapezius) shaped something like a trapezium, hence its name. It attaches here at the back of the head and runs along down the shoulders and spine. Here are the muscles that form the fleshy portion of the thigh. Here are the muscles of the head. Here is the muscle which controls the ear, and which, in lower animals pulls it forward and backward. Once in a while you can see a boy who can wiggle his ears; that is because of the development of this muscle. These muscles are not usually developed in mankind, because we have no use for them. They are well developed in horses, donkeys and other animals. I noticed a donkey, while riding out in Chicago who kept one ear sticking right out in front, and the other ear pointed backward, and so he had a very curious appearance; but he

proposed to know what was going on, both in front and rear. This is a very prominent feature of animals who are food for beasts of prey. Darvinists tell us that there was a time when mankind was in the monkey stage had to have such ears as a horse, and that they were so large that they could brush the flies off their noses with them. Sometimes a persons has not been developed out of the monkey stage far enough to lose the ability to move his ears. That is the way I used to console myself, when I found that one boy could move his ears and I could not . .

Here is a muscle that goes clear around the mouth, so that we can pucker the mouth and whistle. This is one of the sphincter muscles. We close the eyes with these sphincter muscles . All the orifices of the body have these sphincter muscles, so that we are able to shut them up when occasion requires.

There are many muscles about the face. Here is the muscle for raising the lip. Here is the muscle that pulls it down. Here is the muscle that pulls the corner of the mouth. These are the muscles which pull the corners of the mouth up to one side. Here is the laugh - ing muscle over here. Here is a curious muscle which compresses the nose. Here is a strange little muscle attached to the nose at the side, the wing of the nose. It is called the "levator labii superioris alaquae nasi."(I hope none of you will tell anybody what I said then.) These muscles are used to give a scornful expression to the face.; other muscles are to used to give different expressions to the face. Suppose, for example, a person wished to look sour: all he has to do, is to use these muscles here and pull down the corners of the mouth; he then looks sour. If he wants to look happy, all he has to do , is to use these muscles and pull up the corners of his mouth. That is all the difference

there is in the appearance of a sour man and a good natured man; and it is all the difference there is between the two, because, of course, the corners of the mouth correspond with the inside. It is by means of these muscles that the face is the mirror of what is inside. For instance, if a person wishes to look scornful, all he has to do, is simply to operate this little levator labii superioris alaeque nasi, and there he is, looking very scornful. (Laughter.) These muscles are very interesting, for they make the face a perfect index of the brain. The character of a man shows out upon his face. You know what a person is by his face. People's characters shine out upon their faces like a mirror, because these nerves of the face connect with the muscles and with the brain. Whatever we think, is expressed by the muscles which pull the skin of the face. A lady asked me the other day how to cure wrinkles. I told her that some wrinkles were not worth curing,--for instance, smiling wrinkles. I have heard of of people having wrinkles made in their faces by a surgical operation, so as to make them look amiable,--dimples in their chins. But there is another kind of wrinkles which people don't like,and which they would like to get rid of. Those wrinkles come from scowling. These are vertical wrinkles, and they should be rubbed out. They can be cured by a skilful massauer or massauese, but then one must not cultivate those wrinkles, but horozontal wrinkles which will help cure the vertical wrinkles by crossing them and cancelling them. But if you are cross and sour, and are constantly scolding about your neighbors, you will have these vertical wrinkles; and if you wish to get rid of them, you must turn over a new leaf, and make your face wrinkle in another direction and thus, by degrees your face will be stretched out so that it will present a more pleasant aspect.

Here is an inside view of a portion of a muscle. That is the way a portion of a muscle looks through a microscope. Here is a portion of muscular fiber, showing the fiber all split up into small fibers or fillibrae. Whenever the muscle contracts, each one of these little parts of the muscle contract.

Here is a representation of a portion of the nervous system. Up in this bony box the cranium, we have a great mass of nerve cells: Some one has counted them up. I think there are some two or three billions of them--two or three billions or trillions of them, I am not quite sure which--but it does not make much difference, because we cannot comprehend either number. These cells in the brain send out long fingers into the spine and the nerve trunk. These nerve filaments which run out from the brain, go to the liver, lungs, heart, and other organs of the body, and control them perfectly. Telegraphic despatches are going on all the time between the brain and the rest of the body.

nerves Here you have a representation of the various nerves found in the face. Here is a ramification; here is one nerve coming out from here to here, and in this way they spread all over the face. Here we have a representation of another single nerve coming out from the brain in just the same way (it happens to be bottom side up, but we can see it just as well). Here the nerves run into the teeth where they divide. When we have the toothache some of these little branches are in trouble, and speak out it expresses it by a sensation of pain.

brain Here is a representation of the brain. Here is the top of the brain,--the upper part-- and here is the lower part. Here is a representation of the spinal chord and the brain together.

Here are great branches which go out; here is where the spinal

chord is enlarged. These are the branches that go to the arm. Here are the branches that run to the legs. These nerves are connected with the cells at the upper portion of the brain. Here are some cells connected with the legs, and close by, are some of the cells which connect with the arms. Here are some cells which connect with both the legs and the arms. Here are some cells with connect with the muscles of the face and with the trunk. All the different portions of the trunk and body have nerve centers in the brain. These muscles of the body have centers in the brain. Sometimes a tumor will form in the brain, and it will cause these muscles to act when they should not. Here we have a collection of nerve-cells in the brain, which has charge of the function of coughing. Another center is called the vomiting center. Another is called the heat center; and thus all the different functions of the body are represented in the brain.

This represents a little slice of the spinal chord, cut off off transversely. This is the way it looks when put under the microscope. This shows the nerves on the inside. The spinal chord has the means of transmitting, through its nerve-fibers sensations to the brain and different parts of the body.

Here we have a beautiful illustration of some of the minute cells which are found in the body. Up here is a nerve cell, for example (in the ganglion center) it is one of the same kind of cells as those found in the spinal chord. It is a living thing itself,--just as much a living thing as the spine. There are millions of these creatures in the spinal chord of every man and every animal; and each one of them has an independent life, just as much as a bird, a fly, a grass-hopper or a fish. These cells are sending these nerve fibers out; some of them are enormously

prolonged. Some of them run to the brain, some to the body and some to the legs,and some of them run out like this (referring to screen); some of them have many poles or arms, and some of them have much less and some of them have only one of two. This represents a ganglion with a large number of cells, and these are fingers running out from them. They are joined together and form bundles, but they are all called nerves.

Ear? This represents a special sense in the ear .. Here is the large external portion of the ear. Here is the canal of the ear. Here is the drum or membrane of the ear . This is the drum cavity. Here is the little bone which looks like the blacksmith's anvil, and so it is called the incus. Here is the bone which looks like a mallet, hence it is called the malleus . Here is one which is like a stirrup, hence it is called the stepes (2) The ear has many wonderful structures. Here is the cochlear which means snail-shell which it resembles. Here is the portion of the ear which is called the labyrinth, because it has many labyrinthine canals. These three parts are called the center of equilibrium.

Here is a representation of the eye. The eye is an optical instrument like ~~the~~ a spy-glass or a telescope,--only in some respects it is not so perfect as instruments which opticians make; in other respects it is more perfect. It is filled up with transparent substances. Here is an arrow up here which refers to a picture which is formed at the back part of the eye. It is formed just as a burning-glass or a lens would form a picture. Once in while the eye is too long, so that the back part of the eye comes out here; so the picture would be up here, and the back side of the eye down here. The nerve spreads out on the back part of the eye. If the back part of the eye is here, and the picture is there, it would be blurred. Sometimes the eye would be flat and

the back side of the eye would be out here and the picture would be behind it; in other words, there would be no picture at all, because there is no room for the light. Here is a picture illustrating the condition of the eye called myopia or nearsightedness, and here is another picture, showing the opposite, atropia or too long sight.

Here is a picture representing the viscera, the organs found within the trunk. Here are the lungs and the heart within the chest. Here is the diaphragm which makes a partition in the trunk cavity, dividing it into two parts, the chest and the abdomen. Now underneath the diaphragm, first of all, lying next the heart, is the stomach. In every one's anatomy, the stomach lies close by the heart. That is the reason the heart is affected by improper diet; a person gets palpitation of the heart by eating ice cream, for the same reason. The heart is on one side of the diaphragm, and the stomach is next to it, on the other side. Here is the liver, and on the other side is the spleen. Here is a sort of apron attached to the lower border of the stomach and hangs down in front of the intestines. Here you see the intestines, and here is the cover to them, which is called the omentum. Then here you see the kidneys, the right kidney lying under the liver.

Now it is very important that these organs should lie in the right position. Now notice here, what the form of the human body is. You see there is not much falling in at the waist; it is pretty near a true curve all the way down. Sometimes the body gets drawn in here (at the waist), because men sometimes wear belts and constrict their waists, and thus the interior of the body is pinched in. Now there is no space to spare in the trunk,- there are no "rooms to let" there. All these organs are packed into the inside of the body, like articles in a well packed trunk

so that when the waist is compressed, some of the organs must move either up or down. But they can't move upward, because you see the ends of the ribs are pressed in here. It is impossible for them to move up, so they must move down. Sometimes I have found a poor stomach away down here, instead of being up here in its proper place. I asked one young lady where her stomach was, and she said, "Away down here somewhere, and upon examination I found it there, sure enough. This was because her stomach hadn't had a chance of remaining where it belonged for years and years. She couldn't tell why this was so, as she had never worn anything tight in her life; so she assured me. These organs are all attached to the spinal trunk by bands, and when the stomach falls down, the band by which it is attached must be stretched the whole distance to which the stomach falls. If this stick were a rubber, and one should take one end of it and go over yonder to the wall while I held the other end, it would not break but it would be greatly stretched, and so the muscles of the stomach stretch, but it is an exceedingly harmful process. That is the reason people complain of feeling heavily across them,- a dragging sensation, a dragging pain in the back, a weak feeling of weakness in the back. It is not the back that is weak. It is the pull on the nerves that causes this feeling. It is because these organs are hanging on the spine. Now when a person goes around with all these organs hanging on the spine, it is no wonder that the poor spine aches. But it does not ache because the back is weak or because t ere is anything the trouble with the muscles except that these organs are suspended from the spine, instead of being held up as they should be.

Here is a beautiful representation of the stomach. Here is the place where the food goes in, and here is where it goes out.

This is the cardiac orifice, and here is the pyloric orifice. While this pear-shape is preserved, it gives the food a chance to work towards this orifice; but when we compress the waist, the stomach is pushed down, this end being attached, and the other end being also attached, a pouch is made down here. I found a pouch in a gentleman's stomach the other day that was big enough to hold a quart; and I have seen cases in which the stomach had a pocket in it six or eight inches long. In this end of the stomach there was a pocket, away down to the lower portion of the body. It is no wonder that such persons have a great deal of trouble with their stomachs, for when the food gets into that pocket, it don't get out, till that pocket gets full and running over, so that the food sours and decomposes. There was a gentleman here some year ago who had the dyspepsia. But he could not control his appetite. But he had his wife with him to take care of him, and she would sit down by the table with him and tell him what to eat, and what not to eat, and how much to eat. She would say to him, "Now, Thomas, thee must not eat any more." She would sometimes take things away from him, and she would watch over him, to keep him alive. We never should have cured him in the world, if it hadn't been for his wife. One day Thomas got away from his wife and went down town. She followed after him just as fast as she could go. When she found him, he was just coming away from a peanut stand. She saw him put a peanut in his mouth and swallow it as quick as he could, and put his hand into his pocket for more, but she captured his hand and his peanuts at the same time. About three weeks afterward, he vomited up some of the peanuts which he swallowed at that time. They had been in a pocket in his stomach all this time, and undigested. Now it is an awful thing to have a pocket

in the stomach. It is all right to have a pocket in ones dress , or clothes; but food is not intended to remain in the stomach over three and a half hours, and where it gets into one of these pockets, I have known the food to remain 24 hours,--and even three weeks. Now when persons have sick headaches about once a week, it means that there is a pocket in the stomach, and that pocket is full and must be unloaded ..

Here is a representation of the lungs. It can hardly be believed, but it is a fact, nevertheless, that if the living membrane of these lungs were taken out and spread out on a level surface, it would cover 2000 square feet. Now that seems incredible, but it is because the lungs have such a multitude of little cells and small passages, millions upon millions of them; the whole of the lungs are filled with these minute cells and channels, so that there is an infinite number of them, and the membrane is very thin. Now these lungs receive the air. But they have no good chance to receive the air, and by reason of the lungs not being sufficiently aerated, little germs will get in,--some of the bacilli of consumption, for example--the germs of consumption which come in with the breath. These grow and develop, and the whole lung will finally become consolidated with disease, by and by the lungs break down and the patient dies of consumption.

Here we have some cells from the interior of the body. This represents some cells breaking down; it is a portion of a cavity in a lung. Here is a lung that is suffering from pneumonia. All the cells are filled up. Here is a portion of a cell in which a cavity has been formed by the operation of consumption in breaking down the cells .

Here are the blood-cells in the blood. This is a representation of human blood, and here are the blood cells. Here are some of

They are elliptical in shape, and so small that 3500 of them arranged in a row will make a row only an inch long. When they are arranged together in this way--like a rouleau of coin--that indicates a healthy body.

Here are what are called pus cells, cells in which some germs have got and worked; certain germs get into these cells--the white cells (I haven't time to tell you all about it to-night), and they spoil these cells, causing them to become diseased, and thus they become pus cells. Here is a representation of the blood course through which these fragments pass. The blood corpuscles arrange themselves in a sort of procession, and they keep marching on and on with great velocity.

Here is a representation of the skin. Suppose this is the skin of the hand,--the surface of the hand. This represents a little sweat gland or duct. Here is the gland, away up there, and here is the little duct running through the tissues till it comes to the surface, a little spiral duct, which finally empties itself here. The tissues are full of cells.

This is a loose cellular structure which lies underneath the skin. It is by this that we can pull the skin up and hold it up. At one time a man was traveling around with Barnum's show, and he could pull the skin over his ears. Now the kidney is a sort of internal skin, an arrangement which operates very similar to the skin. Here is a gland and a long duct running away from it, similar to the skin. If we could imagine the skin all covered up and done up on a bundle in the shape of the kidney, it would be a kidney with ducts emptying inside, and a common duct carried fluid into the bladder. When one organ does not do as much as usual another organ does more, in order to offset the lack on the part of the other organ. The liver is not so active in warm as in cold

weather, so the urine is dark in hot weather, while it is lighter and clearer in cold weather, and the fluid is much more abundant. But the skin is more active in warm weather, and thus makes up for the lack of service of the kidneys during the warm season.

Here is a representation of some cells in the body (ciliated epithelium) which look like a waving field of grain. These little fingers bring up dust and germs into the throat where they can be expectorated. These cells live after the man is dead. These little hairs have been found waving two days after the individual was dead. They have wonderful vitality.

Fig. Here we have a representation of the structure of the liver; here are the lobules of the liver; these are the hepatic cells. They make sugar and they unmake sugar. They convert starch into sugar, and they convert sugar into starch. They also destroy some poisonous substances which are taken into the body, and make a person think he is bilious, but it is merely because his hepatic cells cannot do their duty. Here is a parasite sometimes found in the liver.

gland This represents a gland structure. These are the glands in the stomach which make the gastric juice. The gastric juice is made in these little pockets. (Referring to screen.) I don't know what that is. (Laughter.) I won't undertake to talk about something that I know nothing about.

Here we have a representation of trichiniae. Here is a single trichinia; and here is a bundle of them. They live in the muscles. A bundle of them will live in a muscle; they will live inside of a muscle for years and years. Some of you have had symptoms of wandering pains in your limbs and muscles, and thought perhaps it was rheumatism. A German professor has discovered that these wandering pains are due to trichiniae in their muscles. Probably

one tenth of you here are troubled with these parasites (I refer to people who eat pork, of course). They are so common in this country that a German will not eat American pork until it has been carefully inspected, and yet people will eat ham sandwiches, and all sorts of similar combinations of swine's flesh which is constantly liable to contain trichinae. The trichinia is a parasite which is found in a human being, after having passed through a regular migration. When a man dies, rats sometimes visit the graveyard and get at the body and eat some of it and get this parasite. Then they visit the hog-pen to get the corn that is given to the hog. Then the hog kills the rats and gets trichinae. Then the man kills the hog and eats him and he gets trichinae, and so it is passed around, as one scavenger eats another,--the rat eats the man, the hog eats the rat, and the man eats the hog, and so the circle is complete, the parasite being passed around from one scavenger to another till it comes to man, the last and greatest scavenger of all. I don't think any of you will ever want to eat pork after having once seen these things which it contains, under a microscope .

S A N I T A R I U M L E C T U R E S .

THE HUMAN FIGURE . Aug. 3,1893.

J.H.Kellogg, M.D.

--oOo--

Ladies and Gentlemen : I am going to talk to you a little while to-night about the human figure. For a number of years I have been making a careful study of the human figure, and with special reference to the discovery, if possible, of a definite relation between the external conformation and the internal conditions of the human figure. When I first began this study, I confess I hadn't the remotest idea of how a human being ought to look, or what was the natural form of the human figure. I had some general idea, of course, but no very definite idea. And I did not get very much help from the study of text books, and by the study of anatomy I soon discovered that they were wrong. I found a very marked difference between the figures of people, but I did not at first understand the significance of this difference. I at length devised an arrangement for making tracings of the body, giving a front view and a side view, or, in fact, taking tracings of the body in any form desired. This apparatus is very simple, consisting of an upright support,--a wide board with two uprights in front, and a pencil at the end of a long handle and arranged agains the uprights, and which could be made to slide, keeping it perfectly at right angles, following all the different outlines of the human figure. Having prepared my apparatus, I began to make tracings. After making some dozens of tracings, I found curious dissimilarities and resemblances, the significance of which I could not understand; I couldn't see any significance in them.. I made two or three hundred tracings and spread them out on the

floor. I selected those that seemed to be alike, and those that seemed to be unlike, spread them upon the floor and then got down on my hands and knees and studied them. I studied them hours and hours, and days and nights before I got an understanding of what these lines and differences meant. This being a new line of study, I had nothing to guide me, and, until after some months of study I began to think that I was going to get no results; but after a year or so, I began to see something of the meaning of these various peculiarities of the human figure, and recently, out of many hundreds of tracings, I have made a collection of tracings that I think teach something; I have had them arranged and included in a series of charts, some of which I will show you. I have included many of these pictures in charts. There are some other things besides tracings which I have made to which I will refer you as they help to elucidate the idea which I wish to present.

First, you see here, a representation of the Venus de Milo, which is accepted by the artists as one of the best representations which we have of the feminine figure. It embodies the ideas ~~the ideas~~ of the ancient Greeks as to what the human female figure should be. Notice here the proportions of the shoulders, the waist, and the hips, and the relation of the waist to the height. This is one of the points which I have studied with very great interest, and for reasons which we will presently see .

Here you see, just below, a representation of the interior of the body. Here you see the outside, and here is the inside of the body. Here you observe what is called the "waist line," if there is such a thing as a waist line; but really there is no such thing as a waist line in a well developed female figure. Nature does not make a waist line. Wherever there is a waist line,

there has been a constricting band; it is bands that make a waist line. I have never seen a waist line upon a normal human body; waist lines are wholly the work of compressing bands. Now in that portion of the body which is the smallest in diameter, we have many of the important organs located. In this figure here, which is copied from a drawing made by the eminent Prof. Ziemssen, of Germany, copied from an engraving in one of his works, and consequently authoritative,--you see here the position of the various internal organs . In the first place, we have the trunk divided into two parts by the diaphragm. It starts from the lower border of the ribs, and rises up on either side to a little above the lower end of the sternum, and is shaped like the arc of a dome. Here you have above this point, the lungs and the heart; and below this on the right side, we have the liver, and on the left side, the spleen , and just below the liver we have the stomach which comes in contact with the diaphragm at its left portion. Behind the stomach is the pancreas, and below the stomach we have the colon and the small intestines in the lower portion, the abdomen and pelvis. Here we have a papier mache representation of the Venus de Milo. And here we have a representation of the Venus de Medici, with the exception of a portion of the arms which have been taken away,--and the figure has even been robbed of its stomach , so that I cannot describe that to you; but you see here the heart, liver, and lungs all in position. Here you see the relation of the liver to the kidneys and spleen. The stomach lies just underneath the liver and kidneys. The right kidney is a little lower than the left, being overriden by the liver. I will remove the diaphragm so that you can see its shape as it lies in the chest. The lower border comes down to the last of the ribs, and the upper part rises up into the chest.

Now here is another figure which I will explain as I pass along. Fig. 2, upon the chart, is an exact copy of a figure which I found in a fashion magazine. This is not an imaginary figure which I have prepared to present here, in order to exhibit fashion in its most ridiculous light, but is actually copied from a fashion plate, and I have seen persons, live figures,, who were posing as lay figures for milliners, and I think I may say of such that that is about all the use they could have been to this world I have seen persons going about with waists no larger than you see here. Now the thing that I want to call your attention to, particularly, and the thing that this chart is intended to illustrate, is the impossibility of the internal organs remaining in their normal position, when the figure is changed from its normal outlines so as to conform to such a figure as this. Here you see a normal figure, and here you see a figure which has been subjected to compression of the waist. Here you have a normal figure, and here, a figure that has been compressed at the waist . Here you have a figure which has not been subjected to so great compression as in the other case. It is not an extreme case of displacement of the viscera. It is not an imaginary case of displacement, but I have verified it in many cases, and it is copied from a particular case in which I made a careful study of the exact position of the various viscerae.

Now please notice the differences in position here. In the first place, let us begin on the right side. The liver is wholly above the lower border of the ribs; the liver does not appear below the border of the ribs in a normal figure; it does not come below the mark indicated by my pointer. This is the lower border of the ribs, and the liver is entirely above this point. Now I will place my pointer at the same point in the contrasting figure,

(Fig. 4), and you notice that the liver falls several inches below the lower border of the ribs. I examined a liver to-day in which I found it three inches below the lower border of the ribs. You notice something has happened to the liver. Here are two lobes of the liver, the right and the left lobes, the right lobe constituting the greater portion of the liver. Here is the left lobe; it does not come so low down as the right lobe. Now observe the liver in the compressed figure; you notice that the left lobe of the liver is folded down; the liver is compressed to such an extent that the left lobe is folded down,--the right lobe is crowded down out of place, and the left lobe is folded down upon the right lobe.

Now let me call your attention to the stomach. You see here, that the stomach is so placed, that its lower border falls about two thirds of the distance from the lower end of the sternum (this bony cage) to the lower border of the ribs; it falls at a point just about two thirds of the distance from the lower end of the sternum to the lower border of the ribs you see. Now if you will look at the contrasting figure (the waist of which has been compressed) you will observe that the stomach is almost entirely below the lower border of the ribs. It has fallen down so low that the upper part of the stomach is below the lower border on a line with
of the ribs , while a healthy person, the lower border of the stomach is above the lower border of the ribs; but here the upper border of the stomach has been dragged down until it is on a line with the lower border of the ribs, and the lower border of the stomach has fallen almost below the umbilicus. Now this is not an exaggerated case. I was examining a patient only a week ago to-day, in which I found the lower border of the stomach down at

this point (almost at the extreme lower end of the abdominal cavity) , only an inch or two above the pubic bone . In this case, there had been several causes at work to produce this condition. I think the first cause was, undoubtedly, compression of the waist. The bowels, the stomach and all the other internal organs had been dragged down, and in consequence of everything being dragged down, and the upper border being more closely attached, the walls of the stomach had been separated to make room for the internal organs. I said to this lady, "I think you must have had this dilatation of the stomach for several years." "Yes," she said, "I am sure I have had it for many years." Said I, "What evidence have you that you have had this trouble for many years?" "Well," she said, "five years ago, I ate five dozen bananas, and I didn't feel any uncomfortable after I had eaten them, so I am quite sure my stomach must have been very large." Certainly the stomach must have greatly dilated to enable her to do that. I was very glad that she told me of this circumstance, because it so positively confirmed my diagnosis of her case.

Here you see a disturbance of other portions of the viscera. If you will look closely at this healthy figure, you will see that the right kidney lies entirely above the lower border of the ribs. The same is true of the other kidney. Looking at this papier mache figure, which more nearly resembles the living figure, you can perhaps see this a little better. You notice that the kidneys lie above the lower border of the ribs; they lie quite high up. Many people suppose the kidneys are lower down than they really are. A gentleman was complaining of kidney trouble causing pain in his back, and in trying to locate the kidney, he placed his hand down here (below the kidney), instead of placing his hand at the lower border of the ribs, it being just above the last rib .

Now the kidneys sometimes projeet a little below the ribs at the back part, but the ribs project downward in front, so that when they are looked at from the front side, the kidneys are entirely above the lower border of the ribs. But these kidneys are fallen below the umbilicus. I often meet cases in which the kidneys are fallen far below the umbilicus. There are cases of this kind which have come to my notice. There are ladies whose cases I have investigated in which I have found the right kidney crowded out of place , and this is true of nearly two thirds of the cases who consult me. A day or two ago, in my examinations, I found, in a single day, three cases in which the right kidney had gone visiting among its neighbors , the stomach and other organs; it went where it liked. The left kidney was also crowded out of place, and was down here. This is what is meant by the medical term "floating kidney." The moorings of the kidneys have been relaxed to such an extent , by the compression which had been brougtt to bear upon them, that they break loose and float about. This pressure from above crowds down the stomach, and when the stomach is crowded down, the pancreas behind the stomach are also crowded out of place. I met a case not long ago, in which the spleen had been crowded out of its position so that it lay at the very bottom of the abdominal cavity. I found a large hard mass there, about as large as an infant's head. I said to the lady when I first made this discovery, "I see you have a tumor." "No," said she, I think not." "But," I said, "I find a tumor here." The next day, upon examination I found the tumor on the other side, it was over on the right side. The next day when she called for examination, it had moved over to the left side. I proceeded to investigate, and I found that the tumor could be moved everywhere. I finally suspected the truth of the matter, and sent the wander-

er home under the ribs ; but it didn't stay there, and was somewhat painful. A couple of years ago, my attention was called to this case. I saw a case a week ago, in which I found the spleen occupying this position, in the lower part of the abdominal cavity. I asked this lady how long she had had this difficulty. "Ever since I was a young woman," she said . "When I was a young girl I had the malarial fever, and my spleen became large. Another young lady suggested that I could crowd it out from under my ribs by bandaging. So I put on a tight bandage and crowded it, and kept putting on tight bandages and crowding it, and by and by I felt it pop, and out it went , and it has been out of the way ever since."

Now, what harm comes of this displacement of the internal organs ? What harm can it do, if one should dislocate his elbow joint, his hip joint, his knee joint, or even a finger joint? When any of these things happen, we very readily appreciate the harm that would come. But the dislocation of either of these joints is a trifling circumstance when compared to the dislocation of the stomach, liver, kidney, spleen, or any of these important viscerae contained in the abdomen. Suppose for example , there is a displacement of the colon:--the colon runs across the upper part of the abdominal cavity, and then descends on this side, then runs across the center of the trunk and ascends to this point. Here the descending colon lies under the stomach, and as the stomach is prolapsed, this part of the colon is prolapsed, and I have found cases in which the stomach was prolapsed until it had reached the end of the abdominal cavity, and the colon was clear down under t that, and folded down upon itself. Now what harm is done by this displacement of the internal organs, so long as they don't get outside of the body; for, so long as they remain inside of the body,

they will probably continue to do their duty. What is the harm of having a dislocated arm ? The full use of the arm depends upon the arm remaining in the position in which nature placed it; the different bones must maintain their proper relations one to the other; the bones of the arm must retain their proper relations to the bones of the shoulder; the different bones must be natural and the limbs must retain their flexibility, and then all their several functions can be performed . The same thing is true with reference to the abdominal viscerae. The abdominal cavity is like a well packed trunk. If you were going to travel, and take your trunk, you would ~~slit~~ pack all the different ~~articles~~ parcels snugly together. If there was something which you wished to take which was very choice, you would put it in a very snug place, and you would pack it so carefully and snugly that it couldn't jostle about, and then no serious injury would be likely to happen to it, as it would not be likely to get crushed. Now nature has used the same care in the Placing and the adjustment of the various organs of the trunk. Here we have the lungs and the heart, which are vital organs and of the utmost importance, and they are placed in this bony cage, each by its movements aiding the various other organs in the performance of their functions. They are well protected by this bony cage, the ribs at the sides and the sternum in front, which, in part, protect the heart also. This same bony framework also protects the liver , which lies on the right side and entirely above the lower border of the ribs , so that it is entirely protected by the ribs. The stomach is in part protected in the same manner, and the spleen, kidneys and the pancreas which lie behind the stomach are also protected. So we find that nature has placed all these things just where they belong. You observe, too, that these heavy organs of the trunk,--the liver which weighs about

3 1/2 pounds, the spleen which weighs several ounces, the pancreas, etc., are placed in the upper part of the trunk, just above the narrowest portion, the waist,--just above this region which is called the waist.

Now what keeps these organs in place? What keeps them in their natural position? It is because the abdominal cavity is packed full, and there isn't room for anything to be jostled about because it is in the condition of a well packed trunk; every particle of space is filled; there are no "rooms to let" here; there is no space left unoccupied. The hollow organs, in order that the space shall be fully occupied always, are always distended with gas sufficiently to keep the abdomen slightly expanded . Sometimes , however, they become entirely empty, and then the abdominal walls sink in; there is then a sunken-in condition of the abdominal walls, as we find in certain cases of disease. But they are naturally distended with gas, and by this means every little space is filled. That is the reason that when there is the least little bit of an opening in the abdominal wall when a rupture or hernia occurs, a little knuckle of the intestines will squeeze into the opening and find its way out, making the opening larger and larger, until the person has a serious rupture, and sometimes death occurs in consequence. Then there is no room to spare in the trunk,you see. Nature has put every organ where it belongs and filled the abdominal cavity, and because the abdominal cavity is full, each organ must stay where nature has put it . The trunk is packed full and the lid is put on, and all the organs are held right where they belong. The consequence is, that when there is a diminution of the trunk at any point, the organs located at that point must remove to some other place,because there isn't

room for them there, so they must move either up or down,--they must move somewhere. So when we have compression of the waist, the organs move downward, because they cannot move upward, because of the bony framework there which forms a bulwark for the protection of the lungs and heart. Hence, in a compressed waist, we find the organs pressing downward, the lower walls yielding, everything is pressed downward .

Now a displaced liver, kidney, or any other organ, can no more do its work properly than can a displaced shoulder, elbow or hip. This kind of dislocation, it is true, does not produce such immediate pain and suffering, as does that of the shoulder,etc but it produces, in the long run, much more serious injury than arises from a dislocated bone. A dislocated stomach is one of the most unfortunate things which could possibly happen an individual. I could talk to you a long time in reference to the injuries which come from the displacement of the viscerae. One of these displacements is that of the pelvic organs. But these displacements are of very small consequence in comparison with the displacements of the organs which occupy the upper part of the abdominal cavity.

This is a subject about which we have heard but little, because it has not been investigated until recently. When I look back over my earlier years and see how inefficient I have been, and how much more I might have helped individuals than I have done, I am appalled at my ignorance of these facts. It was only when Glenard and Pasteur and some other eminent investigators examined into this subject some years ago that we got much light upon the subject. I got hold of some of the facts upon this subject quite early and have been observing these facts ~~facts~~ for a number of years back,and it is only within the last three or four years that I have been able to see daylight on this subject, and

I have learned a great many interesting facts that I had never dreamed of . I can't help but think with regret of cases upon which I have labored for months and months and months and doing them little or no good. I remember of the case of one gentle - man who came here for treatment ten or twelve years ago. He had been under the care of various physicians, Dr. S.Weir Mitchell of Philadelphia among the rest, without receiving any benefit. He had tried "rest cure," "mind cure," and various other "cures," to no purpose, and finally came here , supposing he was coming to a "water cure," but he found when he got here, that we used some things beside water in our medical work. Well we brought to bear upon him all the resources of the Institution. He was a very patient man, and he was a wealthy man, and his life had been given merely to taking care of his property and looking after his health and he was willing to devote just as much time to the work of getting well as was necessary. He stayed with us one month, and at the end of that time, he went away just a little better. We regulated his diet and did a great many things for him that were useful, and we helped him some, but he wasn't very much better. He went away somewhat disappointed, and went to the West Indies, and then went to Europe and went to various places there, and finally he came back here again and was no better. In sheer despair, not knowing what to do for himself, he came back here, having found himself steadily growing worse all the time. Upon seeing him again, I said to him, "I am glad to see you again. I remember your case, and I know know what is the matter with you, and can help you. I can tell in advance what is the matter with you, but I won't tell you anything about it now. You come into the office and we will investigate your physical condition." He did so, and

and upon examination I found that his stomach was prolapsed clear down to this point (indicating it); his bowels were prolapsed and his stomach was dilated,--everything in the abdominal region was out of plase, in consequence of which he hd a very bad figure. His stomach was all fallen in, and when I said to him, "Let me see you stand up," this was hes position (illustrating it by taking position.) "No ," I said, "that is not the way to stand up straight! Then I said, "Stand up against the wall." Then he stood up against the wall in this way (taking position.) Then I went around in fromt of him and pushed him back against the wall, got his shoulders back, and his hips back and drew in his abdomen, and he found that he could stand straight. Then I treated him in accordance with these indications, and the consequence was, that in six weeks he went home perfectly well, after years and years of struggling to regain his health. I met him in Boston a year afterwards, and he was still well. I heard that he was in Boston, and as I had business there, having some surgical work to attend to, I sent word to him, and he came up to the Hospital to see me, and I found him looking perfectly well. He had been gaining in flesh but had diminished two inches in his posterior diameter. He weighed more than he had been weighing, and was so strong, helathy, and vigorous, that, as he told me, he enjoyed better health than he had ever done before . No w the only thing needed was to make this man stand up straight,--but I am anticipating. We will pass along, and I will show you some other pictures here .

These figures are intended to convey the idea of a human figure in its different positions and attitudes; for instance, here is a male figure, the Apollo Belvidere. This represents one of the models of the ancient artists, and is considered a model figure of a man. Now you can see the relation of the waist to the chest, the

hips and the whole height. This is copied from Tissier (?). This is what the artists of ancient times considered beautiful (referring to female figure.) This is what they found in women of natural figures in ancient times. This (referring to another female figure) is from a modern painting,--a celebrated modern painting of a female figure by a French artist. You see the same outlines here, as in the other figure. You see a convex line in front instead of a furrow at the waist. You see convex lines all along the anterior portions of the body,--a concave line behind and a convex line in front. This is exactly what you see in naturally formed mammals. When you notice a horse, you see a concave line along his back, and a convex line along the abdomen. You will see the same thing in a cat, cow, dog or ox, all mammals. You can scarcely name a mammal in whom you will not find this principle true,--a convex line running along in front and a concave line along the back. Now how is it possible for a female figure in its normal condition to have a concave line in front and a convex line behind? How could it be natural? It is not natural. There is no such thing known among primitive women,--women who have grown up naturally.(Referring to figure of French actress.) This figure is copied from a French theatrical woman. It is copied from a photograph, and not a fashion plate. See how hideous this figure is. Compare it with this natural one. I dare say this woman considered herself beautiful; and I suppose her manager would not have allowed her to appear, if she had had the proper shape of this other figure . But really how ungraceful and unnatural a form is this for a female! It looks more like some of the brackets which are stuck up on a mantlepiece than a human form. How could her ~~our~~ ideas have ever become so perverted as to think such a figure as that beautiful ?

Here are some studies which I have made, and I want to show you what I have found to be the normal female figure. Here is the convex line of which I am speaking. There is just a slight depression here (at the waist) in front. Here is the convex line. There is generally a greater convexity of this line in normal figures than is represented here, but I have drawn this line as I do not wish to be considered as presenting an exaggeration. You see there is a decided convexity ~~here~~ all along here. Now you will see here a proportion between the waist and the height. I have found by careful study that the percentage of the waist-measurement to the height of the civilized woman is very much less than that of the Venus de Milo or that of the Venus de Medici, the waist-measurement of which is 46.7 of the height,- not quite one half the height. I have measured these and other original ancient statues, and I have found the average to be about the same as that of the Venus de Milo. Now in civilized women I have found the percentage of the waist to be as low as 37 percent of the height, and sometimes 31 and a fraction, only about one third of the height, whereas it should be not quite one half the height. Among the Yuma Indians I found the waist percentage to be 55 percent of the height, And the woman whom I measured seemed to be was a well proportioned woman. I made a few investigations in the Midway Plaisance the other day; I measured quite a number of persons there and among those whom I measured was a woman who was a South Sea Islander, a Nubian woman, an Egyptian woman and an Indian woman, and I found the average proportion of the waist to the height measurement to be about the same as that of the Venus de Milo. So we see, when we study women who have had no deforming influences brought to bear upon them, that they have the proportions which were considered as beautiful by the ancient Grecian artists, because

because they chose women with the most graceful outlines as models. But it would be pretty difficult nowadays to find women who could have posed as models for the ancient Grecian artists .

Here is the outline of a German peasant woman. This woman had acquired this figure without any training. This is the way she always carries herself wherever you see her. Whether sitting down or standing up, you will always see that erect carriage. And she had acquired that correct carriage by carrying burdens upon her head . Her father was a small farmer, and the small farmers in Germany, you know, send their produce to market on the heads of their wives and daughters. They have no horses; some of them are not able to keep donkeys even, and have no beasts of burden. A man starts out with his flock of sheep, and when he meets a man with corn, he exchanges with him some wool which he cuts off his sheep for a sack of corn, and this he continues to do until he has received thirty or forty ~~pounds~~ sacks of corn in exchange for his wool. Farmers in Germany do not often keep sheep even to carry their vegetables etc.,so their wives carry their vegetables upon their heads in great bundles. I have seen some German women carry a load that it required two men to put on their heads. One woman carried 90 pounds, and another carried 110 pounds. I have seen German women pick up great hods of mortar that probably not one of you could lift and go up to the top of a building with it to "tend the masons", and then come down with a great load of rubbish. (Referring to figure.) This is the outline of a Welsh woman. You see here the same large waist, and the same flowing outlines. You see there is no sudden falling in of the outlines of the waist. Notice also the proportions of the waist , as compared with the shoulders and the hips.

(Referring to figures.) Here are some other figures for comparison with the Venus de Medici. Here you do not see the enormously constricted waist which I have shown you in the copy of the photograph and the fashion plate. Here is the outline of an Italian woman which an Italian made in Paris, and you see here the same convex outline in front, and the same concave line behind. Here is the outline of an Abyssinian woman,--a modern woman, and there is the same full outline of waist with that of the Venus de Medici, instead of the furrowed and constricted waist of the French actress.

This chart is intended to show some of the damages which result from constriction of the waist, but I see that it is already 9 o'clock, and I haven't time to go into this subject, which I wish to explain to you fully, so I will simply say a word or two more about two or three figures, and then, in one week from to-night, I hope to go into this subject fully. This is the outline of a natural waist. (Referring to it.) It is elliptical in shape. Beside it is the waist of a fashionable woman, one whose waist is furrowed and constricted and perfectly round,--and she imagines herself beautiful ! Every one who looks at such a figure as that knows that it is a "made up" figure. No one ever imagines that a woman ever grew into such a shape as that. A woman with such a figure as that looks more as though she had been whittled out of wood or chiseled out of stone. There is no grace or beauty in it; it is simply a rude caricature of the female figure. Here is another natural figure. See how many variations there are in the outlines. There is the falling in at the back. This represents the spinal column. Here are the strong muscles running in front; there is a slight projection there. Here we have the projecting ribs at the sides, which by their

lateral movement pump air in and out of the lungs and aid the circulation of the blood. Now when we have the waist compressed we have these beautiful outlines destroyed, but we also have the functions of the internal organs partially destroyed as well.

Here are some representations of the appearance of the liver when it is compressed by any sort of constriction of the waist. This poor liver has been compressed until it has decided to refind relief by giving away a portion of itself; and here is a portion of the liver which has been sloughed off by this process of constriction. The liver is trying to get rid of a portion of itself, in order to get rid of the pressure. A short time ago, an eminent German surgeon was called upon to perform an operation upon a woman's liver. It had been compressed and compressed day after day, and finally the woman thought she was going to die right away unless something was done for her. The surgeon opened her and found that she had cut her liver in two, and he had to remove the portion of the liver that she had amputated, and she escaped with her life, but she was obliged to part with a portion of herself in doing it.

This is another representation of what happens to the woman who compresses her liver. Notice these ridges and furrows in this liver. This is where the liver has been crowded up against the ribs until the marks of the ribs have been left in the liver, cutting into the substance of the liver. I have seen such cases as this. The right lobe of the liver has been stretched down until it is twice its normal length, and the other lobe has been crowded against the ribs so that the ribs have left their marks upon it. Here is the appearance of the development of an immense abdominal tumor.--But I will talk to you further upon this subject at another time

S T E R E O P T I C O N L E C T U R E

ON THE

HYGIENE OF DRESS. Dec. 7,1893.

J.H.Kellogg, M.D.

--oOo--

Good evening, Ladies and Gentlemen : We will talk tonight about dress, and some matters connected with it. (I do not know of any question of hygiene that is more important than that of dress, When we consider the fact that there are some thirty millions of women in this country, and many millions more in other civilized countries who are subjected to a torture compared with which that of the Inquisition was insig ificant, to say nothing of its influence upon human life and the subjection of the human system to morbid conditions in consequence of wrong habits of dress which are far reaching in their consequences and which are undermining the health of fifty or sixty millions of our people, physically, mentally and morally. The great difficulty is, to get men and women to see the importance of this question. I am glad to see, however, that intelligent men and women are becoming more and more interested in the importance of this question . (Lights all out.) At the present time, thousands of American women are taking an interest in this subject. Physical clubs and dress clubs have been formed in different parts of the country. Magazines wholly devoted to dress reform have been started, and are more or less successful, and there is much attention being given to this subject .

Within the last ten years particularly, I have been studying the consequences of errors in dress, and my study has been largely in a new line. I conceived the thought, a number of years ago,

that there must be some definite relation between the exterior of the body and its internal conditions; in other words, that there must be a relation between external deformities and internal states or conditions of the body. I expected that we should find internal deformities corresponding to external deformities. I could find no information upon this subject in any book, and so I undertook to begin an original study in this line. I devised a very simple apparatus consisting of an upright frame so arranged that a person could stand in the frame, and with clothing tightly fitted to the body, the exact outline of the body could be traced on any plane. I began taking my outlines in this way, and when I had made fifteen or twenty of them, I spread them out on the floor in my office, and got down on the floor and studied them. I looked them over and over; I would go back and forth over them on my hands and knees, examining and comparing them in every possible way, but I could not make much out of them. After I had made forty or fifty more, I made another comparison, and found that some of them were alike. I began my tracings, and after I had made several hundred different tracings, I began to see something definite in them. I then began my tracings on the top of a paper, and also noted down the conditions which I found in the subject, making, in each case, a careful examination of the internal viscerae, and the condition of the liver, the stomach, the kidneys and the spleen, preparing and making an outline of two views--a front view and a side view. After a year or two of this kind of study, I found myself able to make classifications of cases, and to establish some relations existing between external forms and internal conditions, so that, after a while I was able to make predictions as to what the internal conditions of such and such figures would be, from their external deformities;

and I finally found myself able to predict, with the most absolute certainty the conditions that I should find when I came to make an examination of the internal viscera.

I am going to show you tonight, some of the results of these studies. I have selected some of the most typical of these tracings,--some which will give the best ideas of the relations existing between the external deformities and the internal conditions of the human body. I have examined more than a hundred different figures, from which I have prepared a series of charts and some corresponding outlines prepared which I will throw upon the screen.

(No.1) This is a view of the Venus de Milo. --I want, first, to give you as correct an idea as possible of what the natural human figure is, and that is represented as well in this figure of the Venus de Milo as anything that I could place before you. You see this figure is somewhat deformed, by age or accident, there is a portion of the arm gone--but notwithstanding this mutilation, this statue, having been buried for many, many years, has at last been exhumed, and is still considered as the best model of what the human female figure should be, that the world is able to present; there is no figure that is nearer the true ideal body than this. The original of this figure is the work of an ancient Grecian Artist; it was probably chiseled 2000 years ago, and at that time time it was considered among the Grecian artists, as a perfect woman's figure.

(No.2) Here is a representation of the "latest style." As you look at this figure, I would like to have you picture to yourselves, as well as you can, such a figure as this when the clothing is removed. Just remove this artistic dress, if you can, in your imagination, and see what hideous deformity you will find.

Picture the little round waist no larger in proportion to the rest of the body than is this,--a waist like that of a wasp. The aim of women of fashion (most of them, not all) ~~sim~~ is to make their bodies conform to their ideal of a beautiful dress; whatever the consequences to her body may be, the fashionable woman will have a small waist. I will show you some of these consequences a little further on. I will now show you the internal organs in a correct position, and in an incorrect position.

(No.) In this figure, the organs are in a correct position. In this figure, they are in an incorrect position. Here are the ribs; here is the sternum, and looking through the ribs, you see the lungs. Here is the right kidney, and here is the left kidney. The right kidney is a little lower than the left kidney, being overlapped by the liver. Now please observe the various relations of these organs. The lower border of the stomach falls about on this line, the upper border rising above the ribs, passing above this triangular space. The stomach follows this border two thirds of the distance down, to a point where a line drawn across would cut the lower border of the ribs. The small intestines are located below the colon (this is the normal position.) The stomach is attached to the oesophagus by a membrane which holds it to the backbone. The liver is also attached by a band which holds against the backbone. The same is true of the kidneys.

(No.) Now observe the consequences of a moderate constriction of the waist. A woman whose waist was no smaller than this would certainly affirm that she had never worn anything tight in her life; that while she had worn a corset, she had not worn it tight; that though her waist was small, she didn't have to wear anything to make it small. I am sure I have been told that

hundreds of times. On looking at this outline, I am sure that these ladies will say that it is not an exaggeration. What you see here is an actual fact, just as I have observed these conditions and noted them down with great care . I examined the original of this figure, and found the organs just as they are represented here. I would like to have you compare them with these organs. Please notice where the liver is here. Here you will notice that it is an inch or two above the border of the ribs. On the other side, it is an inch or two below the lower border of the ribs. Observe the form of the liver; it covers the greater part of the right side. Here is the right lobe, and here is the left lobe,--it covers the stomach in part. Now the form of the liver is changed,--the right lobe has changed its form, and it has been prolonged downward by the compression to which it has been subjected.. But the greatest difference is in relation to the stomach. Here is the lower border of the stomach . Here is the lower border of the stomach two thirds of the distance from the upper to the lower border of the ribs about the sternum. I will place my pointer across the lower border of the ribs and measure across, and we find that almost the whole of the stomach is below that point, instead of being two inches above it, as a normal stomach should be . Here you see is a pocket off here. Please observe the kidneys also: the kidneys lie above the lower border of the ribs, almost in the chest-cavity,--in the upper part of the abdominal cavity. Here is where they should be, in a normal condition; but here the kidneys are crowded far down; they are crowded down below the liver, because when the liver goes down, the kidney must go down also, because it has got to do so. The colon is dragged down by the stomach, until it is kinked and fold-

ed upon itself. Here the intestines are are also crowded down. This is a front view. Here you see a side view of the figure. Here you see a great protrusion of the abdomen,--I will show you a figure of this kind. A protrusion of the abdomen always means a prolapsed stomach ,--spleen, kidneys, bowels--everything tumbled down, as you see here, instead of being in their proper position, as in this figure.

(No.) Now I am going to show you here some other figures, the purpose of which is to illustrate the normal outlines of the body; here you can see what the normal outlines are; we must get the proper outlines in our minds. The difficulty is, that the fashions have created a vicious taste, so that the majority of people have incorrect ideas of what a good figure is. I did not know, myself, when I began to make these outlines--I hadn't the slightest idea of what a normal human figure looked like, but by degrees I found out something like what the human figure ought to be, and what it should look like. Now the normal condition of the human figure exactly corresponds to the ideals of the ancient Greeks, and we have some normal figures in modern times, and they have these same characteristics. This is an outline of the Apollo Belvidere, one of the most famous ancient Grecian statues. Please notice these outlines,--the large proportion of the waist to the height ~~shoulders~~, etc.

(No.) Here is a painting from Titian. In this case, the waist is large in proportion to the height ~~in this case.~~ I have made a special study of the dimensions of the waist, comparing the measurements of the waist with the height, computing the percentage of the waist to the height measurement. I have made a study of Italians, Amricans, American Indians,--the Yumas, the tribes of the Indian Territory, and in the Dakotahs , and Chinese women; and

I have had medical missionaries in foreign lands, in India and in different parts of the world, and in other Christian countries, collect measurements for me, and I have made a careful study of all these figures. I also went down on the Midway Plaisance (and I suppose many of you have been there also), and by using "backsheesh, I was able to get the dimensions of quite a number of the women of different countries,--there were some Samoan women there, and some Egyptian women, and some Nubian, and some women from other nations, and upon measuring them, I invariably found that the waists of those women who had grown up in the natural way were much larger than that of the average American woman. Dr. Anna Weld (?) of Wellesley College has shown that average to be 24 inches, and the proportion of this waist measurement to the height is 38 % or 39 %--about 39 % of the height. But I found among the Yuma Indian women, the waist 50 % of the height, and in the Venus de Milo a percentage of 47.6 % of the height,--that is nearly one half the height; the Yuma Indian has a waist more than half the height. That is about the same percentage as that of the Apollo Belvidere .

(No.) Compare these proportions with this photograph. This is not taken from a fashion-plate, nor from a "poster;" it is taken from an actual photograph of a French actress; it is a photograph which I obtained in Paris.

(No.) This figure I have had thrown upon the canvass to show you how the nude figure, so as to show you the outlines of this figure itself. The normal ~~outlines~~ proportions are always healthy and beautiful. It is only when the figures are dressed fashionably , that we get these hideous deformities. No artist would think of painting a picture like this. No artist would dare to put on canvas and present for exhibition a figure of this style, and with this

kind of a waist,--and you see the reason why : the deformities would be so hideous that it would not be regarded for a moment. The point that I wish to bring before you clearly, is the fact that the deformities of the body which are induced by tight lacing and improper dress mean something more than a superficial change in the body; that it is not simply a hideous outline that it produces, but serious internal deformities, as well .

(No.) Here I have had thrown upon the screen two figures with the proportions that I find among normal people. This woman has never worn anything tight about her waist, and had developed a good figure when about twenty years of age . Here is a convex line running all the way down to the pubic bone,--a convex line from the chin clear down. There is no furrow here,--and there is no furrow here (pointing at figure,) and there are no sharp angles here . You see that the modern type, when it approximates a state of health, agrees with the ancient type .

(No.) Here are some figures illustrating the same thing. Here is another figure,--the outlines of another young woman who had a good opportunity for physical development,--a young Welsh woman. You see she has a good waist, and a good strong figure. Her waist is large in proportion to her shoulders, as in the case of the Venus de Milo which I have just shown you .

(No.) This is an Abyssinian woman. Here is the Venus de Medici, and here is an Italian woman (the figures are so large that I can hardly see the outlines.) Here is the outline of a young woman who poses as a model in the art schools of Paris. While in that city, I found that the artists would not allow their models to wear tight clothing. The young woman who poses for a figure is compelled to wear loose clothing so she can have a good opportunity for physical development, and this young woman never

wore anything tight in her life. She posed as a model ever since she was a very young child.

(No.) This is the same figure as the one shown above. You see the same convex line; there is no waist-furrow here, nor here . (Indicating with pointer.) We find the same outlines here, that we did in the Abyssinian woman. This is not an hypothesis ; it is an actual fact. And you see the same large waist in proportion to the rest of the figure. In the fashion-figure, the outlines of the undressed figure would be perfectly hideous if it had the proportions of the dressed figure,- if there were a great furrow on this side, and a great furrow on the other side, what a horrible figure it would be. As I have stated, it is not the external deformity;— it is the corresponding internal deformity that is the most serious matter.

(No.) Now I will show you the difference between a normal waist and a fashionable waist. The fashionable waist is circular- perfectly round, while the normal waist is elliptical. See this outline; it is a hideous one. This is the consequence of compression of the waist. / This liver, when it was in the body of the foolish woman who owned it, was doubled over on itself, and this part of the liver was pressed into the ribs. This is the right lobe of the liver; you see it has been squeezed all out of shape, and this portion has been pressed upwards against the ribs.. You see how these ribs have been crowded down onto the liver by constriction of the waist . Here the ribs have been pressed into the other side, and this portion of the liver had been prolonged into the shape of an appendage. In some cases, this compression of the waist has been so great that a portion of the liver has been actually cut off. (A German surgeon, a few years ago, found it nec-

ecessary to perform an operation upon one of his lady patients for what he supposed to be a tumor . The poor woman had something in her abdomen rolling about, and she was in such great pain that she was likely to die. The surgeon cut open her abdomen , and instead of a tumor, he found that the liver had been cut in two. She had compressed her waist until she had snipped her liver in two, and one partwas floating about wherever it listed. The surgeon took this portion of the liver out of the abdomen and the poor woman lived, but she had to gat along after that with only half a liver. A great many women have the use of only half their livers,--their livers are so crippled by their dress that they have only half the use of their livers. I have heard of two such women as I have just described. When I was a student in the Bellevue College, I used to meet some of my friends there. We made arrangements with the Prof. by which we met several "hard cases There was a room furnished us, and some of these "hard cases" were brought in there for us to pass our diagnoses upon, and we found that the most difficult portion of our instruction. From that time, instead of going home to dinner, I would go in there and make observations of hard cases. One day, I found a case there that puzzled me very much. In the case of a lady whom I was examining , I found a large mass rolling about in the abdomen, and I could not make out what it was. By and by a bright idea dawned upon me, and I said to the Professor that this seemed to be "a fissured liver, induced by tight lacing." The Prof. said he thought that was the right term to apply to it. The next time I examined the lady, I said to her, rather bashfully , as so few ladies are willing to admit that they wear tight clothing) "Perhaps you wear your clothing pretty tight."---"INDEED I DO !" she answered.

"I tie my corset-strings to the bed-bost at night, and tighten them in the morning, and take them up at night again, and in the morning I have had a friend to help me get them tighter," etc. So I got where I could make my diagnosis right away,--that this was a case of fissuered liver from tight lacing. Said the lady, "After a while I felt a great bunch growing upon the lower portion of my body, and the doctor told me that it was a portion of my liver that had been nearly cut in two. Upon conversing with the doctor about the case afterwards, I found that this was really true. (No.) Now I want to call your attention to the upper part of the trunk. Constriction of the waist not only produces deformities such as I have been talking to you about, but other deformities which I shall show you . (One of the most important functions of the body is that which is performed by the lungs,--breathing , respiration. The lungs are a great air-pump which pump the fresh air in, and pump the carbonic acid gas and other poisons out, and at the same time drives the blood in towards the heart, pumping the air into the upper part and the blood into the lower part. Some years ago, I was performing an operation for a tumor, and the tumor was attached to the axillary vein, and I had to dissect it off the vein, and I found it difficult to do so, because, at every breath, the veins would collapse and disappear, so I had to make my cuts between the breaths, and I had a good deal of difficulty in doing it , showing to me more clearly than ever the work that the lungs do,--furnishing blood to the liver and every other organ,--particularly the liver which lies underneath the diaphragm; and at every expansion of the chest there is a strong pull at the liver, pulling the blood out of it . At every restriction of the respiratory process the lungs are crippled and hence the blood is not properly circulated, and all the bodily

functions suffer, particularly the digestive functions . Now these illustrations represent normalrespiration and abnormal respiration. When I was a student at Bellevue Hospital, Prof. Austin Flint taught (and it is still believed and taught) that there are two kinds of breathing or types of respiration, the masculine and the feminine. But I couldn't understand this: so long as a woman had to breathe as well as a man, and her heart beats the same, and she has the same kind of lungs, and why shouldn't her lungs act just the same as a man's lungs do? I couldn't get any explanation of this theory; but when I began the practice of medicine, I found that women breathe just like men, and the conviction after awhile dawned upon me that all women ought to breathe like men, and I watched the dogs and the cows, and the two sexes of different kinds of animals, and I couldn't see but what the male and the female classes of animals breathed alike, and so I thought, "It must be that a man and a woman ought to breathe alike; that there was no such thing as masculine breathing and feminine breathing,--or rather, man-breathing and woman-breathing. I finally adopted a plan of investigation by means of an instrument which exactly traced the respiration ,or the current of air produced by the lungs. When this instrument is applied to any portion of the lungs it will represent their action by curves. Where the curves are small, that means that the muscular movements of the lungs are small. When I applied this instrument to the upper part of the chest of a man, I found it made the small curves, representing small movements; but when I applied the instrument to the lower part of the chest, it made these large curves, indicating free movements of that part of the chest. That was what was wanted, as I knew,--free movement at the lower part of the chest, and slight movement at the upper part

of the chest, whereas, physiologists have been telling us that in women we have the opposite of this, viz., free movement at the upper part of the chest, and slow movement (or no movement) at the lower part of the chest. — And this is what I found in women who wore a corset. But upon examining a civilized woman who had never worn a corset, and I found that she breathed just like a man. (No.) And here is the tracing made of that woman's breathing--small movements at the upper part of the chest, and free movements at the lower part of the chest. Then I thought that if a man were put under the same circumstances as the woman in the corset, he would breathe in the same way; so, after some persuasion, I induced a young man to put on a corset. I induced him to wear the corset long enough for me to apply this instrument to his chest and see how he breathed. So he wore the corset with pain and torture till I had applied the instrument, and then he threw it away very promptly and gladly after I had got through with it ,--and he breathed just like a woman while in a corset. So I saw that what is called "feminine breathing " is simply corset-breathing, and that it is not properly called "feminine breathing" at all, because a man breathes just the same way under the same conditions .

Then I extended the experiment a little further, and found a poor dog who was willing to wear a corset for a little while in the interest of science, and I put a corset on him, and upon examination, I found that he also breathed just like a woman with a corset on,--

No.) And here is the tracing that shows this. I also found that a dog without any corset on breathes just like a woman without a corset on,--and just like a man without a corset on. And I found that a female dog breathes just as a male dog does. So there is really no difference between male and female respiration.

Females and males of all species breathe just alike, under the same circumstances.

I took my machine away down into New Mexico among the Yuma Indians, and carried it into the forests where the Indians lived in their native state, and had never worn anything like civilized clothing, and I found an Indian woman who was sufficiently tame to allow me to apply my instrument to her chest and see how she breathed, and this is the way she breathed ,--

(No.) She breathed just ~~like~~ as a civilized man or a civilized woman who had never worn a corset would breathe,--and she breathed just as a dog breathes.

But I found one woman who had been in the habit of wearing a corset, but who has reformed (Jenness Miller). She happened to be here and I induced her to allow me to apply my instrument—

(No.) And this is the way she breathed,--slight movements at the upper chest, and while the movements were somewhat freer than they should be, as the result of her early habit of corset-wearing, yet they were not so great as at the waist; for many years she had cultivated chest-breathing, so the muscles of this part of the body were disproportionately strong, and the movements of this part of the chest were freer than normal. There is no harm in this, however, provided there are , at the same time, the proper movements at the waist.

I think I have demonstrated,--in fact it is admitted, at the present time, by some of our best authorities--that there is no such thing as a "feminine type of respiration." The British Medical Journal, published in London, reports a discussion of this subject before the British Medical Society, by the President of the Society and other leading members, in which they demonstrated that ~~there is no such thing~~

there is no such thing as a "feminine type of respiration," or woman respiration, but that men and women breathe just alike, under the same circumstances .

Now we will go on, if you please, with the study of these figures. You will see by this chart (exhibiting chart) a representation of the outlines of a normal figure, and of an abnormalone, (No.). This is a device of Mrs. Adams of Chicago. She undertakes to show that the male figure is included within a triangle, and that the normal female figure is included within a double triangle, as you see here . This is the front profile, and this is the side profile, the anterior line coinciding with a circle, being convex all the way . Mrs. Adams had arrived at the conclusion that this was the normal female outline, having made a careful study of the subject, both of ancient artists and from the modern artistic standpoint. She is an artist, and she showed me some of her sketches of the outlines of the human form, and I said to her, "This agrees with my tracings made from life. I showed her some of my tracings, and compared them with her sketches, and they coincided exactly. This shows that Nature and Art agree. But Art is based upon Nature, and they must agree. (No.)This figure is intended to show an important lesson: it shows that the anterior line of the body coincides with the beautiful curve of a circle, the posterior line being convex. Now when the anterior part of the body is compressed by the application of a corset, the back is straightened and the front part of the body is broken down. This (referring to outline.) is also the work of Mrs. Adams; you will find it in a little book which she has written. When she showed me this outline, I said to her, "This exactly corresponds with the fact." This was her idea as an

artist, and this was the very fact which I had produced, and they matched exactly.

(No.) This is the outline of a young woman who had been in the habit of lacing tightly, but who had reformed. There is still too much fullness of the abdomen, owing to a depression here, but there was a free movement here.

(No.) This was her condition at first, but she reformed at twenty. There was still a ~~convexity~~ depression of this line, although, as I said, she had reformed when about twenty years of age , and had made a great improvement. When the corset was first laid aside and the tracing was made, you see what had happened: this concave line in the back was straight, and at the same time, the anterior portion of the body is carried in and the convex line is entirely lost, and we have, instead, a concave line in front, and a destruction, in part, of the concave line behind . So the effect of corset-wearing, is, first, to break in the front part of the body and cause a protuberance of the abdomen , as you see here, —

(No.). And second, to cause a straightening of the back,--a destruction of the normal curves which give not only beauty but strength to the human figure .

Now here is a collection of deformities, exactly as I have found them. So these are facts and not hypotheses; each one of these is a solemn fact--a painful fact, a distressing fact--for each one of these persons was the victim of some form of tight-lacing, constriction of the waist resulting in serious deformities of the body, and what you see here represents hundreds of cases,- and I have counted some thousands of them, and I think I may say, I have made a careful study of that number.

(No.). This figure shows you the interesting case of a young lady some thirty years of age, in whom I found a tumor, as I

thought . The next day she came in again, and I found the tumor had disappeared from that place, and was over here. The next day, the tumor had rolled over here. So I became very much disturbed about it, and investigated the subject further, and I said to her, "This is a very strange tumor; it rolls all over the abdominal cavity." Upon further questioning her, I found that when she was very young, she had had what is called "an ague-cake," or enlarged spleen, which had made her waist a little larger than she thought it ought to be. The lump was about as large as her fist, and it was large enough to make her waist a little too big, as she thought, for she wanted a small waist,--like that of some of her mates. So she asked some of them what she should do with this lump, and they suggested that if she could get it out from under her ribs, she could tighten her clothes more, because now it was in the way. So she went to work to get it out from under her ribs. Every night she drew her corset up very tight, and next morning she tightened it more. She kept on in this way, until one morning as she was tightning her corset, she felt something pop out from under her ribs, and after she had forced it out, it had the freedom of the whole abdominal cavity and rolled about until it got clear to the bottom . This lump ~~proved to~~ her spleen,--and not only her spleen was down, but all the other internal organs were down also. Here is where the liver was; here is where it ought to be, and she had all the horrors of dyspepsia in consequence of the excited state of the nervous system induced by tight-lacing .

(No.) Here is another very interesting case. This woman was a seamstress about twenty years of age. She declared that she had "never worn anything tight,"--didn't believe in it." This corresponds with this figure of Mrs. Adama',--the sinking in ~~at the~~

in front, the protrusion of the belly and the straightening of the back, and all this deformity produced by wearing a corset. You can see that this woman has grown up in a corset, just as a cucumber grows in a bottle. The consequence was, that things have gotten terribly out of shape. Here is the kidney, and here is where it ought to be. Here is the stomach, and here is where it ought to be,--and so on,--all the abdominal organs tumbled into confusion amd all out of shape .

(No.) Here is another case, which is also a very interesting one . This was a man instead of a woman , and he had a prolapsed stomach. When I saw that, I said to myself, "How can this be? No man has ever worn a corset,"--but I must take that back. Military officers sometimes wear corsets. They have not ambition enough to train themselves into good figures, so they put on corsets so as to make the soldiers under them believe they have good figures, when they have not. Of course this poor man had never worn a corset in his life, but I found, upon talking with him that he had been in the habit of wearing his suspenders tightly around his waist, so that his pantaloons were in this manner suspended from his waist, for he was a farmer, and this allowed free motion to his shoulders and arms.(This is the same thing as wearing skirts suspended at the waist,—and that is worse than wearing corsets. Tight waist-bands with heavy skirts dragging at the waist produces far greater damage than wearing corsets.) Well, I found this man's stomach, instead of being in its proper position, away down here.(Indicating position.)

(No.) Here is another very interesting case. This man was about forty years of age, living near Boston, and for many years, he had been an invalid, and suffered all sorts of trouble; had been under the "rest-cure" treatment by Dr. Mitchell for a time;and he

was here for a time, and got better; went away again, and had a relapse; came back again, and I found he had a prolapsed stomach, and said I, "You must stand up straight, because you are now in such a position that your whole internal organs must be out of place." This is the way he stood (assuming position.) By habitually assuming such a position, the internal organs were all tumbled down out of place. (Will this young man lend me his chair? This was his position in a chair .(Sitting down.) Very many people sit in their chairs in just that way. By this position, the central portion of the body is broken down. This is his position when sitting, and when he was sitting in this way, he was acquiring a crook in his back, while the internal organs were crowded down out of place. I said to this poor man,: "We can do nothing for you until you stand up." I then made him straighten up, putting back his hips and shoulders, elevating his chest and drawing in his chin,--and then he looked like a different man . For about six weeks that man was cured of all his nervous troubles and went home. I saw him a year later, and he was in excellent health; he had gained ten or fifteen pounds. He had dimished his diamater here (in the abdominal region.) This was cured by simply making him stand up, because the had standing, the bad sitting, and the bad poise were the principle causes of this deformity. This cause is in operation in many cases of women who wear their clothing tight. Their waists are weak, and when they sit down, they sit in this relaxed position--lying in the chair, I sometimes call it. This produces the same trouble. I will show you some figures pretty soon which will illustrate this .

(No.) Here is a woman, (this is the same case that you saw above),-this is the front view; the stomach is prolapsed and the liver is down out of place, whereas, by taking the correct position

the organs were drawn up into place. Here is a front view of the same figure, in which you see the stomach enormously out of place .

(No.) Here are a few other deformities. This young woman has worn her "health-corset" all her life. She said she had never worn an ordinary corset,--it was a "health-corset. But it makes no difference what you call it-whether you call it a health-corset or an anti-health corset. .. After giving her a glass of water, and here is where it was, instead of being there.(Indicating with the pointer.) Turning it this way will give you a better view (the figures have been reversed, so you did not get as correct an idea of the positions as you otherwise would have done) Here was the liver, and here is where it ought to have been. Here was the right kidney, and here is where it ought to have been. .It was not a surprise to me to find that this young lady had for a long time been afflicted with nervous disorders of various kinds; she was so nervous that she could hardly live; she had been the same nervous invalid for ten or fifteen years; the restriction of this "health-corset" had caused all the mischief. She said that when she put on her corset in the morning, it was a nice fit (she drew in her breath, and then her waist was not constricted). She showed me that she had made no effort at constriction, claiming that it was "too loose." But did you ever hear of a woman admitting that "it was too small?" When she had exhaled her breath, she could double her coat over some distance, whereas, before, there was just room to button it up . This young lady ties her corset in this way (tying.) That isn't tight now, but the moment I draw in my breath, it straightens it right out. So this young woman applied her corset after she had exhaled the air from her lungs, and it was just the proper fit; but the next time she breathed, the

corset bacame tight. When she ran up stairs, or when she hurried anywhere, or had to take a long breath, the corset was too tight, and that long breath not finding room for expansion at the sides, something must yield there, in order for the air to get in , and in order to get the air in, as the yielding could not take place above, by reason of the ribs, it must take place below, and so the organs are forced down. And when the breakfast came in, it came from above, and there was not room for it, and something must give way, and the breakfast being uppermost, the ~~other~~ internal organs must go down, and by this means they were gradually pushed down.

(No.) Now I want you to see some other cases which are interesting. Here is a figure of a young woman who had worn a corset for a year, and you see what deformities were already produced here. You see the constrictive action was beginning. It was not yet very serious. This is the effect of the weight of the skirt-bands,--for it was chiefly this that had produced this deformity. And there was an ugly protrusion beginning here; and see how flat the chest is here .

(No.) This young woman began corset-wearing at thirteen years of age, and wore ~~im~~proper clothing till she was twenty. At seventeen this woman had this figure. Her corset had baan laid off and she had been put through a course of training, and the result is the symmetrical lines which you see here--

~~(No.)~~ If we had a circle of the right size, these lines would fall within it .

(No.) This is another interesting case. A young woman aged seventeen, and had never worn anything tight , as she declared. Her mother also declared that she had never worn any-

thing tight;she had been in the habit, ever since she was 12 years old, of wearing a corset, but her mother assured me that it wasn't tight, and showd me that it was not, by putting her hand under it . Her mother had put the corset on her at twelve, so she would have "a good figure,". I made tracings and measurements, showing a change of several inches here (at the waist) with the corset off. I made a tracing with the corset on, and then I made a tracing with the corset off. These outside lines show the tracing with the corset off, and the inside lines show the tracing with the corset on. She measured two xx inches less , when measured outside of her clothing, with her corset on, than when with it off. You see these two inches of constriction carried all the organs of digestion down that much. The diminution of the chest that much had resulted in the enlargement of the trunk below to just the same extent, and this produced a displacement of the stomach ~~of the stomach~~, spleen and other internal organs. A side profile of this figure shows this state of things: a broken down front line , a protruding abdomen, a dislocated viscera, a flattened chest, a projecting chin, round shoulders, etc., all of which are the result of corset-wearing. In a few years more, this young woman would have been utterly ruined .

No.

(Chart .) The purpose of this chart is to show the changes of the trunk in normal respiration and in abnormal respiration . The dotted lines show full respiration,--the expansion is all along that line--in taking breath, we expand all along that line. The trunk may be considered ~~as~~ a rubber bag, if you please, with handles, and as you draw them, the bag expands; it swell outs more in the center, because the center is the most flexible, and you have a movement all along this line of the body in taking breath. In taking breath, we fill air into the lungs,and as we do so,the

diaphragm is crowded down, and as we fill in more air, we crowd down a larger amount of material into the abdomen; the organs are carried down and the diameter of the chest is increased. As the lungs expand more and more and fill a larger space within the chest, the organs below the lungs are carried down, and increase the diameter of the lower trunk , and in that way the trunk expands from the neck to the lower portion of the abdomen . If a person takes a very full breath, after having taken an ordinary respiration, then if we take in a little more air, the chest is lifted slightly, and the lower part of the abdomen is drawn in. Chest expansion at the upper end is produced by inspiration, but chest-expansion at the lower end is produced by contraction of the diaphragm; but full respiration produces an expansion of the whole trunk, the greatest expansion being at the waist .

(No.) Here you see the effects of chest respiration. The chest is swollen out, as shown by the dotted line. Now these figures are not fancies; they are facts; they are just as I have found them, and the tracings as I made them , of actual cases.

(NO.) This represents abdominal breathing; there is very very little movement shown here (at the waist.) There are some who recommend abdominal respiration, but this forces down the stomach, spleen, and other internal organs, carrying them down out of place. Where there is uniform expansion there is little opportunity for displacement; but where the expansion is all in one place, a condition of things takes place which is very favorable to displacement of the viscera

(No.) This shows normal respiration; the dark lines show the normal figure at rest, and the dotted lines show the change of figure which takes place when one breathes out all they can. Now the principal movement, you see, is not down here (in

the abdomen); it is up here (at the waist). It is between this point and this point (indicating) that the principal change takes place in breathing. When a person takes a deep breath, then we have the lines which you see outside--the outer dotted lines. These are the effects of breathing just as I have found them in normal persons.

(No.) The good lady who was the mother of this woman had the good sense to make healthy clothing for her daughter and she had always worn loose clothing, and thus allowed the development of the natural figure, and she breathed naturally (illustrating); she breathed just as a baby breathes,--and she breathed just as a dog, cow and all other mammals breathe, the greatest expansion being at the center of the body where there is the greatest opportunity for expansion.

(No.) This figure shows what happens when a woman who wears a corset sits down,--this line represents the outlines of the woman with a corset, when she sits down. The corset crowds in the body at the waist more and more, and as it forces in the body in this vicinity, more and more, the consequence is , that all the abdominal viscera are crowded down more and more. And this is the only way in which this prolapse of the viscera is produced. Then, by sitting down , and by a strained position and the crowding in of this tight corset with its metallic stays, there is produced the crowding down of the internal organs, which are not so much depressed in a standing position. But my time is up, and I will try and finish this talk the next time I see you .

S T E R E O P T I C O N L E C T U R E .

HYGIENE OF DRESS, Pt. II. Dec. 14,1893.

J.H.Kellogg, M.D.

--ooo--

Good Evening, Ladies and Gentlemen : I am going to talk to you a little more tonight upon questions relating to the physical development of the body, and the care of the body. The great neglect of physical culture in this and other countries is respons - ible for the rapid deterioration of the race during the last century. Chief Justice Coleridge who was visiting this country some years ago, and while at Washington, one of our senators led him to the spot where the Father of his Country once threw a silver dollar over a space farther than almost any other man had ever been able to do The Chief Justice said to the Senator, "I don't see how he did it ." "Ah," said the senator," a dollar went farther in those days than it does now ." That was very true, of money,--and not only money went farther, but muscles went further; muscles were more sturdy, and constitutions were more enduring.. The rapidity with which the race is deteriorating within the last century is something appalling, if people would look at it,--but, unfortunately, they will not . It is generally claimed that we are growing wiser , stronger and healthier, and that there is a Golden Age going to dawn upon us before long. But when we look at the facts, we see that this is a mistake. There never was a time when society seemed to be more generally on the verge of disruption and dissolution ~~as~~ than at the present time, and there never was a time when the human race had so little stamina, vigor and endurance as at the present time.

We see this fairly illustrated by the infrequency with which

we find people far advanced in years. It is not often that we now find a record of a person who has lived to the age of 100 years or more. Statistics show that the number of such persons is very small. A century or a half a century ago, it was not an uncommon thing to find persons a hundred years old, showing their third set of teeth in some cases, while others had acquired their youthful sight again. At the present day, this is very uncommon. Not long ago, I was reading some German statistics, while in that country, in which I found that in Germany, at the present time, centenarians are forty times less numerous than they were a hundred years ago! Now this is something very astonishing indeed. In one single country, and not a very large country at that, we find that centenarians have been diminishing very rapidly. Why, you go back a hundred years in the history of Great Britain, and you will sometimes find on a tombstone an inscription like this(and you will find this inscription on a tombstone in an old grave-yard in England), "Here lies old Parr, who died at the advanced age of 157 years." Then there was another old gentleman who died at 140 years of age.--But old Parr did not die of old age. He had been a vegetarian all his life, and a hard-working man; but he lived to such an advanced age that he was something of a curiosity, and the king wanted to see him. So he went to see the king, and the king fed him an enormous dinner, and as a consequence, he was taken sick and died; so he died of surfeit, and not of old age. At the present day, there are found among the barbarous tribes some very old people. In a little island in the Mediterranean, people 120 and 130 years of age are found. They have subsisted upon figs, which are good food for hard working people. In California, there is an old Indian who is 140 years old, and he

carries six great California watermelons to market, a distance of five to ten miles; and in the winter time he goes up into the mountains, some forty miles or more for fuel. For his daily work at home, he goes away down to the sea-shore and picks up heavy water-logged planks and carries a great load of them home on his back. Now it is this hard work which has kept this man so vigorous and enabled him to live to such an advanced age.

We occasionally find among savage people who live this simple life, some who are very much advanced in life; but in civilized nations we find people very short-lived. It is hard work, however to make them believe it, because statistics show that the average of human life has been increased more than Ten years within the last century. They tell us, for instance, how the people of Geneva, a hundred years ago, lived only 21 1/2 years on an average, while now they live forty. People do not understand the laws of longevity,--or the rule of estimating it. They are like Mrs. Spriggins, who said, "Longevity runs in our family; for instance, there's my John,--he's six feet and two inches; the next child is six feet four, and there's the next, he's six feet seven if he's a foot. He's the most longevity man I ever knew." Now this average longevity does not indicate the stamina of the race. The average of human life at the present time, means simply that the weak, diseased and feeble are kept alive by public sanitation, a little longer than they would have lived with these public sanitary regulations, so that instead of dying off in infancy, or by the time they are ten years old, they sometimes live to be infants of twenty-five or thirty before they die, thus adding to the average length of life. They increase the average at this end of the line, but there is a tremendous increase at the other end of the line. We increase the average of human life by increasing the length of the

length of the lives of feeble and diseased people--people whose constitutions have been abused by drunkenness, intemperance--we keep them alive instead of letting them die a natural death. We protect them by quarantine, keep them in hospitals, etc., and keep them alive, and that increases the average length of life enormously. Fifty years ago, great epidemics would sweep off large numbers of this class of people. When such epidemics as the Great Plague, the "black death" prevailed in civilized communities they carried off great numbers of puny, feeble, dissipated people. One man in Tunis during an epidemic of cholera, said that drunkards died off like flies. During the prevalence of yellow fever in Florida at one time, said that the plague was a blessing in one respect,--by killing off the drunkards. Now these drunkards who are kept alive, by heredity, pass ~~pass~~ the consequences of their bad living to their children, and those children pass it down to their children, and those children to their children. There is a great truth in the Bible statement that the sins of the fathers are visited upon the children, even to the third and fourth generation; also the Scripture which says, "The parents have eaten a sour grape, and the children's teeth are set on edge." This is especially true in reference to intemperance; the fathers sin and the children suffer the consequences. One man who was suffering in this way, came to me, and upon examination, I said to him, "You have a tobacco heart." He said, "I don't understand how that can be; I have only smoked twenty years, and my father and mother are now eighty years old, and they have smoked most of their lives, and I don't see how it is possible for me to have a tobacco heart." He was a doctor, but he hadn't looked into his own case. However, by applying principles with which he was familiar I soon convinced him that he had a tobacco heart. I had simply to

show him that he had a weak heart by heredity ; that his father and mother had smoked away the vitality of his heart, and all that was needed to produce a tobacco-heart was to smoke a little while, whereas his father and mother had strong hearts to begin with and so they were able to smoke sixty years. Not only the heart, but the whole body suffers from this very thing.

Intemperance, tobacco-using, neglect of the body, etc., all result in developing these weak points, and thus we are becoming a nation of invalids; we have emasculated our strength and vigor by persevering in bad habits which we have cultivated, we have imposed an incubus upon men and women by heredity which is tremrndous. Dr. Oliver Wendell Holmes says, "Each one of us is an omnibus in which rides all his ancestors ." Now think what a terrible thing it is to have in our omnibus whisky and tobacco sots, tea and coffee topers, corset-wearers, and all the evils of modern civilization. Now, to have such people in our omnibus is a terrible incubus upon a man's life. Some time ago, a zoologist made a very cruel, but very interesting experiment; he bought a very handsome pair of white mice, and cut off their tails, and when their family bagan to grow, he began to cut off their tails,-- of course it was a very wicked and cruel thing to do, but he did it . As each new ~~group of~~ family grew up, he cut off their tails. This he continued to do, anxiously watching them, and after the twentieth generation, white mice were born without tails. In the first place, he selected healthy mice, one of each sex, with good constitutions, and in twenty generations, by constantly cutting off their tails, he succeeded in producing a new race of mice, raising mice without any tails. Now that is just the situation with the whole human race. We have for a long time been cutting our livers in two by tight lacing, and our stomachs

have been stretched by constriction of the waist and over-feeding, and we have our nerves seriously damaged by abuses of various sorts. Muscles are weakened by negligence, and we are deteriorating and "running out". The average length of human life, it is true, is greater than formerly, but, as I have said, this is because the feeble and diseased are kept alive by public hygiene; it is not because individuals have grown strong and able-bodied, it is because the feeble have been kept alive, and made to live along; but it is a low level, and not a high level of living. There are not so many old people, and so many strong men and women as a hundred years ago.

Some years ago, I was lecturing in a college town before six or seven hundred young ladies, and asked them this question : "How many of you think you are as strong as your mother, and how many of you think you can do as much hard work as your mother. ?" Well , there were three young ladies who hesitatingly put up their hands. One young lady put up her hand, and then threw it down; then she put it up again, and then she peeped over her shoulder to see if her mother was looking. Now there was only so few out of that large number of girls (and those girls were grown up) who thought they could do as hard a day's work as her mother . I visited another college town also, for the purpose of seeing the girls of the college and determining the question which was then up,--whether they were strong enough to go through the exercises of the gymnasium. Most of them protested that they were too weak to do it, -and I thought they were. Their mothers said, "My daughter is too weak; she cannot go into the gymnasium; it will ruin her; and some of them had doctor's certificates that they were not strong enough. They were all

all "on a strike" because the college authorities had made it obligatory upon them to have these exercises, and I was sent there to see if I could straighten things out, and I gave them a little talk ~~to them~~ on some of the outline drawings which I have shown to you. After my talk, I examined these young ladies with reference to gymnasium exercise, and inspected their lungs and hearts and found what a condition they were in, and whether they were fit to go to work in the gymnasium, and among 74 ladies, only three that didn't have deformed spines,--there were only three that didn't have a hump in their backs, or one shoulder higher than the other. A week after that, I talked to the young men of the college, and I told them that there was scarcely a girl in the school that didn't have a crooked back. The young ladies found this out, and they were so angry that they wouldn't recognize me,- and I was glad of it. I was glad of it, because I knew by that that I had made some impression.

This state of things is getting to be universal, so we may know what the next generation is going to be. We also know what these external deformities mean to the internal structure. The hump on the back means a depressed chest, and that means compressed lungs, and compressed lungs mean deficient breathing, and that means a low level of life. What is the difference between ~~an ani-~~ a frog ~~mal~~ and a bird? See what an enormous chest the bird has! Did you ever think what a marvelous power of lungs it has? Then its wings are used as pump handles to work the air into its lungs and chest. Then nature has made its bones hollow and connected them with its limbs, so that the bird can fill itself with air and breathe clear to its toes. This is why the bird leads such a beautiful life; it has such pure blood and such a wonderful breathing apparatus. Now, for a breathing apparatus, the frog

has simply a couple of little bags ; it has no diaphragm nor ribs to breathe with, and it has no breathing bellows at all. The frog simply swallows his air, as we swallow water. You will sometimes see a frog come up to the top of the water, and then you will see the two little holes in his throat move out and in, and if you look very sharp, you will see a sort of winking at its nose or nostrils. It has a pair of valves which expand, and when it swallows a mouthful of air, closes its nose. Suppose you had to take air by mouthfuls, as you do water: you would soon die. But that is the way the frog takes his air; he takes a mouthful and then goes down into the mud and stays there,--and it can stay there all winter, if necessary. Sometimes a physiologist cuts a hole into a frog's chest and takes out the lungs, and the frog hops off, and gets along several days without any lungs . Now this poor frog lives a sluggish, miserable, loathesome life in a stagnant pool, and is perfectly contented with it, because he don't breathe much. Now suppose a person does not give his lungs an opportunity to breathe freely and expand, and take in a good supply of oxygen to purify his blood and clear the cobwebs out of his brain: he lives a sort of frog's life--a reptilial life ; we might say, he lives in the grime, and in the stagnant pools of life, simply because his brain is full of effete matter; his brain has got filled up with gross matter, and he lives a low, feeble, stupid, dull sort of life. If one wants to appreciate the bird-life, and live on a high level, he must have a good supply of air, and keep his blood pure. When a baby coughs and coughs for a long time, his face gets black. That is simply because he has not been able to breathe, and hence, he lacks oxygen. That shows you how quickly impurities accumulate in the blood. That child would die very quickly, if he didn't get air .

There are thousands who are living in this way,--not more than half alive. Imagine yourselves shut in a close school-room--some of you have been there, and you know what it is, sometimes, to sit in a close room; and sometimes you have sat down there until you got dull and sleepy, and stupid, and you could hardly think. Then you would get up and go out and take a little zero air, and you would feel like another person. Jean Paul complained of his school-days when they had to sit by a great wood-stove that nearly roasted them to death. He said he used to choose his Read close to a knot-hole, and that he would occasionally get his nose close up to that, in order to get some fresh air. He says that when he looked out and saw some wandering gypsies, he wanted to join them --not to get rid of school, but because he had such an irresistible longing for pure air. We cannot get a good supply of pure air into our blood, unless we have a chance to expand our breathing bellows. A great many people, before they get to be forty years old, have reached the point where they cannot expand their ribs, because the ribs are attached to the lungs by flexible cartilages, and when we take a long, deep breath, these cartilages bend, and unless they are exercised in this manner they cease to be elastic. I think likely some of you have seen Sandow the athlete in Chicago. How many of you have seen him? Hands up! I am sorry you have not all seen him. He is 5 ft. 8 in. tall; weighs 199 lbs; his neck circumference is 18 inches; arm, 18 inches; waist, 39 inches; chest expansion 52 inches when normal; when he had breathed out all he could, his chest measurement was 46 inches, and when he took a full breath, it measured 58 inches. That is a great difference. Just think of a man expanding his chest a whole foot! There are scores of people

here who could not, to save their lives, expand their chests half an inch, and a majority of those people are over fifty years of age. I am sure half of the people in this room could not expand their chest two inches,--certainly not three. The largest chest-expansion that I have ever measured, was seven inches. Now what does this mean? It means, that for want of exercise, the cartilages which attach the ribs to the lungs have become ossified--stiff--so they won't bend. They get stiff for want of sufficient exercise. You have sometimes seen men who were very agile; they were tumblers; they would tie their arms and legs up into knots and do all sorts of queer things. They are called "double-jointed." The reason they are "double-jointed,is, that they keep themselves nimble. A boy who is going to be a performer of this sort must go into training when he is five or six years old. Every normal little boy, if he commences training at this age, is capable of being trained up to be an agile, a "double-jointed man", if you please; he is capable of performing almost any kind of a feat. But the trouble is, boys are not trained, and, as they grow up their joints get stiff, his back gets stiff, and he cannot bend over farther than this (illustrating;) he cannot reach down farther than this without bending his knees (illustrating.) Their backs are stiff. A certain French gentleman, who was as straight as an arrow at the age of eighty years, was asked by a friend "How have you managed to keep so straight?" He replied, "It is simply this: Every morning when I get up, the first thing I do is to bend over and pick a pin off the floor without bending my knees." Now there are not a dozen persons in this room who could do that. And yet, it is worth everything to one, to be able to do it. When one has trained himself so he can do that, and keeps himself in that condition, when he gets to old age, that

man's body has been kept flexible.

Nature does not stow away in the joints any material to render it stiff and rigid. This comes from want of proper exercise. To illustrate : Suppose one fractures his wrist or injures his hand; they put it in a sling. At the end of two months, all these ridges and hollow places will be smoothed off, and the fingers will be smooth and shiny, and all the skin about the joint will be as white as ivory, and the joint itself will be perfectly stiff. Why is this ? It is caused by lack of exercise . You go down to the river, and you will notice an eddy which is caused by a stone or a rock or a stump in the river. Just ~~above~~ below that, you will see a little eddy, and in that little eddy you will see sticks, chips, etc. floating around; these things remain in that eddy continually floating around. Every little while, there is something more--a dead cat, or something else--brought in and added to the eddy, so there is a miscellaneous collection there . There is very little motion in the river at this point; where the river is unobstructed, it carries everything with it; but this rock, or whatever the obstruction may be, stops the current, and below this point, there is no motion; we have a large collection of debris there . The very same thing happens in the body, wherever there is any stagnant portion of the body. Debris always collects in such a part. A lady said to me the other day, "I am gaining in weight at the rate of five or six pounds a week, -and I am getting large and unsightly. Why its perfectly terrible . I will live in any manner, if you will help me to get rid of this fat. I will eat anything, or do anything, I don't care what you tell me to do, if I can get rid of this mass of fat, - why, it looks as if I had a tumor." Sure enough, there was a

great mass of stagnant fat gathered up around the abdomen, and I might have taken the surgeon's knife and amputated a mass as big as my head, and it would have made an improvement in her figure. I said to her, "The trouble is, you have been leading an idle life, and have been sitting constantly on a camp-stool or an easy cushioned sofa; you have been leading an idle life, and if you wish to get rid of this fat, you must exercise in the gymnasium every day." The reason the fat accumulates around this part of the body is, because the muscles are not used. You don't find the fat accumulating in the fingers, arms, fore-arms, etc., because these parts of the body are constantly used. You never see fat accumulating in this part of the body in active laboring men. It is found in such persons as our aldermen, constantly sitting in the City Hall, that get this great, portly figure. This class of people sit in their chairs constantly with the abdominal muscles relaxed, and there is nothing but nature to stir up the fat in this stagnant place. It is the consulting doctor, the successful doctor who does not have to hitch up and go off and see his patients, but who remains at home and sits in his chair, who is obese. You never see a ditch-digger, or a railroad-track laborer so fat that he could hardly move along. If you did, it is because he had a fat, lazy ancestor in his omnibus.

Now this neglect on the part of many to build up the whole body, is what causes us to grow weaker and weaker from generation to generation, until we have reached a point where we are the most puny, weak and feeble race that the world ever saw, at the present day. Now I may not be able to make you believe this, but it is a positive fact. But the pictures have come in, and now we will go on with them.

(No.) This view represents what happens when we breathe,

when we breathe as we ought to breathe, and when we breathe as we ought not to breathe. (Explaining.) This arched line repsents the diaphragm when it is at rest,--when we have breathed out and emptied our lungs. This inner line represents the chest when it is empty--that is, as empty as we can make it--we can't get all the air out. The outer line represents the under side of the chest when we have taken in a full breath; you see the diaphragm is straightened out, and the ribs are drawn out at the sides, and higher up, because this is the point of greatest movement,--I will trace the distance; notice the distance that my hand travels One end of this pointer travels farther than the other. So it is with the upper and lower portion of the chest. When we contract the chest and take a deep breath, the greatest expansion will be at the waist, and that is illustrated by this figure . This figure is not a hypothesis, it is not a theoretical thing; it is an actual fact,--it is just what I have found. When I had the patient standing in my tracing apparatus, these lines were traced upon the paper. These dark spaces represent the amount of space which is added to the chest-capacity--the amount to which the chest has increased in size by the act of breathing.

(No.) This is a side view of the same thing. This shows how the abdomen expands in front, while the waist expands at the sides. There is also an expansion of the lower abdomen anteriorly, because this is the point of least resistance.

(No.) Here is a representation of what happens with the person whose waist is constricted,--and that is the case with civilized women everywhere. The civilized woman understands that to be thoroughly civilized, she must compress her waist. The first time I was in California, I made a visit to Chinatown, and I was in quest of facts in relation to this matter, and I went and got

introduced to a real live Chinese woman, ~~a~~ the mother, ~~mother~~ the daughter. The mother had large feet, but she didn't intend to have her daughter labor for a living. She herself helped her husband make candles to burn before his idols. She was making arrangements for her daughter to marry about the age of sixteen; and she was laboring industriously to get her daughter's feet down to the regulation size. She had just got her a pair of shoes which were about so long (measuring off about 3 1/2 inches). In one week more, she would wear shoes about the length of my finger. I bought a pair of such shoes, and paid $5 for them, although I knew I was being swindled,--but I was bound to have them, as the Chinaman said they were intended to be worn by a small-footed Chinese woman. I thought they were toy shoes when I bought them, and I allowed myself to be imposed upon, thinking it was the only thing that I could do, for there were no other Chinese shoes there. I heard what the Chinaman said about it, and I expressed my convictions that they were bogus; but they were the measure of this woman's foot,--they measured exactly 3 1/2 inches in length--half an inch longer than the ~~shoes that I purchased.~~ measure of the woman's foot and the shoes intended for her. Her mother said to me through the interpreter, that she hoped to be able to get her feet down to the regular three inches, and then her daughter could be married. In order for that Chinese woman to be thoroughly civilized up to the Chinese standard, her foot must not measure but three inches. In like manner, women usually believe that their waist must not measure only so much; that what nature has done for waist-protection must be utterly ignored; that the waist has no relation to the height, to the shoulders, or to the hips, but that it has relation only to the fashion-plate--that it must be pinched down to the size prescribed by the fashion-plate, and if that is only 22 inches, why then the waist must

come down to 22 inches, no matter what happens. I met a woman in Bellevue Hospital some time ago, and I thought her waist was pretty small. Upon examination, I found a portion of her liver floating around in her abdomen. I said to her, very cautiously and hesitatingly, fearing she would resent it, as many ladies would, "Do you--do you wear your clothing pretty tight sometimes?" "I should think I did; and I tie my corset to the bed-post at night." In order to get her waist to the regulation size, she had pursued this course of waist constriction until she had cut her liver in two.

This is what Civilization is doing,--and yet I have not found one woman,(except the case which I have just mentioned and two or three others), among about 20,000 women who ever admitted that they wore anything tight, or that the clothes that they had on were too tight. And ~~yet~~, at the same time, their clothes were so tight that they couldn't take a deep breath to save their lives , and they would be almost certain to faint away in a place where the air was close. When I talked with them about their clothes being tight,--"Why I can put my fist right under them." You see they have learned the trick of coaxing the stomach and the waist and the things lying thereabout, to give way for a little time so as to leave more room; they find that it is possible to diminish the size of the waist a little more. So long as a woman finds that she can diminish the size of her waist, and that it can still be made a little tighter,--"why, it is not tight at all." If she can diminish it, and it can still be made a little tighter yet, it is "not tight." So long as it is not as tight as it can be, it is "not too tight."

This is a terrible thing, or I would not spend so much time upon it. It is a terrible thing to destroy life in this way. Eve-

ry day, I say to myself, "Why is it that there are somany feeble women? Why is it that you can scarcely find a woman who is healthy who is well? Why is it that nearly all the girls have crooked backs, prolapsed stomachs, dislocated kidneys, etc." Almost all women who have reached twenty-five years of age have something the matter with them. There were seventy-four women at the school to which I have referred, who were supposed to be in excellent health, and yet, upon examination , there were only two or three of them who were found to be in health. I found physical deformities in almost every one of them, and their internal organs displaced to some extent,--prolapsed stomachs, prolapsed kidneys, etc. Now here is the cause of it (referring to Plate); it is this constriction of the waist. You see, when the waist is constricted in this way, every breath crowds something out of place. You see how much space is cut off here ; the diaphragm can contract but little,--there is very little action here. Now look over here and see how this shows the same thing: see here where the movement is. How the action of the chest is changed. There is no very great expansion of the upper chest here, while over here, there is a great change. The diaphragm contracts, but there is no expansion of the waist, because there is no opportunity for waist-expansion, consequently the expansion is all below. This is exactly as I found it in that case, and also in many other cases.

(No.) These diagrams in the center are intended to show the same thing in another way. This darkest portion in the center represents the amount of air left in the lungs after complete exhalation. The lighter space about here in these chest-areas, represents the amount which the chest-cavity has increased in size upon the sides and the lower portion.

(No.) Here we have a representation of the same thing in a woman whose waist is constricted. You see this dark space here: this dark space represents the space left in the lungs for expiration. The lighter space strikes so much more above, and off at the corners, because the sides cannot expand,--these lower angles are cut off and the diaphragm cannot contract. These jet-black spaces represent the amount of breathing capacity which is sacrificed by constriction of the waist. Now this does not mean merely the constriction of the waist; it means the actual displacement of the internal viscera. When the clothing exactly fits the body, it is called "a scant fit," which women claim is sufficient to satisfy the doctor. "Why, isn't that loose enough?" No, that isn't loose enough, because it don't allow room enough for the breath; there must be some space left for expansion of the waist; and if there is not space enough left for expansion of the waist, then we will have all this loss that you see here .

Now it is no wonder that a person who contracts her waist lives such a feeble life. One thing is very significant: whenever a woman faints away in a crowded hall or church, you will hear some one whisper, "Cut her corset-strings ! Cut her corset-strings !" Then the bystanders go fumbling around in their pockets for a pocket-knife, and pretty soon something goes "snap, snap" and the woman revives. Now if a young man should faint 'which they hardly ever do), do you ever hear any one shouting, "Cut open his vest! Slit ~~open~~ down his shirt-front!" or anything of that kind ? No indeed. But a woman has ~~positively~~ partially to be undressed before she can get her breath, if sle happens to faint away in a crowded public place. Don't you see that this is a confession,

on the part of the woman, and of everybody else present, that the woman's dress does not allow her to breathe; that the woman is ordinarily dressed in such a way that she cannot breathe freely, and when she faints away in a crowded place, they know it is be - cause her dress won't let her breathe, and that the first to be done in order to revive her is to cut off these constricting bands; that the first thing to be done is to remove her fetters so as to give her lungs a chance to play, and then she will revive. A woman would not faint away in a crowded church or other public place without this constriction. You rarely know of a man fainting away in church. A woman faints away because she is half smothered by her dress before she gets to church, and when she gets to the hall or church, she receives only a little addition to the inconveniences of the breathing process,--and she needs only a little more--to cause her to faint away.

(No.) I want you to look at these figures now, because they are natural figures. There is a boy of eight,- a side-view. This is ~~this~~ a front view. This represents a girl of fourteen,-- a side view; this is a front view. Here is a girl of sixteen,-- side view;--front view. There is constantly to be seen this anterior convex line; we see this in every case of boys and girls-- this convex line from the chin down. You will see the same ~~line~~ anterior convex line in a horse, dog, and other animals. And you will also see in animals (with the exception of the camel), the reverse of this line, --a posterior concave line. You will see the same lines in normal men and women. But there seems to be, on the part of some women, a disposition to imitate the camel and to produce a hump, and this hump is produced by the breaking in of the front part of the body, as you will see by the next figure.

(No.) Here we see some figures true to life. These are representations of spoiled figures,--figures spoiled by neglects, and spoiled by bad dressing and bad sitting. Now look here: What is the matter here? It is this: the waist of this person is very weak; the muscles of the trunk are so weak that the body has to sag, first one way and then the other; the body is simply swayed about. This poor woman sags in this direction, and the hips fall in. In the case of the other poor woman, the sagging is in a different direction. The head and body droop over, because the muscles are not able to hold the body erect.

(No.) Compare this figure with this one. This represents the same person, only a few months after training commenced. This is before training; this is after training. Now the reason this person has this poor figure, is because the muscles of the back are so weak that it is impossible for them to hold the body up; so it is sort of doubled over. Now in this figure, the head is held back, and the body is upright. This young woman, though not upright when this picture was taken, yet, after a while, by proper training, she became upright, as the Creator made woman ,- and you see what a difference there is between these two pictures. These are figures of persons who have been spoiled by constriction of the waist, by lying down in rocking-chairs, and by neglecting to maintain a proper poise in standing . Here is the cause of a weak waist. The muscles of the trunk are weak, the abdominal muscles sag down, and the abdomen bulges out, being forced out by the pendent weight of the viscera within .

(No.)) Here is the same figure,----no, this is the position this woman was in at first, when she sat down, and she had the same form when she arose. She had sat in this position that

you see represented here, constantly, and when she arose, she retained the same position when she arose, because the form was fixed, and as the result of this habitual position, there was a great pocket in her stomach, a prolapse of the internal organs, and the right kidney floating all about .

Now the consequences of these deformities are very far-reaching. Persons having such deformities as these are never well. I never have found a person with such a deformed figure who was in good health. A dislocated stomach, a prolapsed kidney, a dislocated liver, and fallen bowels are conditions which are of vastly more importance, they are of vastly more consequence and do much more harm to an individual than a dislocated arm or shoulder. A person might have a crooked or broken leg and not suffer so much inconvenience as a person does with a prolapsed stomach. These pictures are the result of such neglects as I have been describing to you,--neglect to train and develop the body .

(No.) Look at this man. These outlines shows the condition of a man both Before and after training,--the blue line representing his figure after he had been trained, and the other line, representing his condition before he had been trained. This man was at first a morose, melancholy individual, but he was the reverse of this , after training .

(No.) This woman was a very similar case. These solid lines represent the woman when I first saw her. You see what a horrible figure she had at first. I had her bend over, and, in order to straighten her back, I had to break it,--while pressing upon it, I felt the vertebræ slip back into place . You see by this picture how much the vertebræ had to be forced in. When she stood up, I asked her to put herself in her former position but

she could not do it . She was able to straighten up, and remain straight, as you see here ./ See the difference between this woman and this.

(No.) Here you see the consequences of a person's standing habitually on one foot. It gives a person just such a poise as this (referring to his shadow.) Standing on one foot collapses the chest, breaks in the front wall of the abdomen and the viscera is very apt to get out of place.

(No.) This represents a very interesting case. This patient neglected to take proper exercise until the viscera had fallen down. Here is where the stomach belonged, and it was found away down here, and I think it had the longest pocket of any stomach that I ever saw. It was shaped just like this . (illustrating .) Here was the colon,--and it should have come right across here. Here was the proper place for the kidney, and it was found away down here, and it had enlarged to such an extent that it became a burden, and it was continually suppurating and discharging great quantities of pus, and it became such a source of disease that the poor woman was a confirmed invalid. Her doctor told her, over and over and over that something must be done, and that she had a tumor; it grew larger and larger, and she had an constant fever and was likely to die . I made a large incision right into the side, here, and I reached in and found the floating kidney, but it was too big to get out with one incision, so I had to make another incision, and even then, the kidney was too large to be got out, and I actually had to cut out the last rib before I could get the kidney out. I finally got out the kidney, and found a stone in it as big as that (indicating size.)... I tell you, women don't know anything about the damage they are

doing when they are disfiguring and deforming their bodies by bad positions, neglect of exercise and constrictions.

(No.) The Chinese woman binds her feet. The mother of this Chinese girl whom I saw in San Francisco, bound her feet so that the toes were forced under more and more and more, until by and by they are all forced under the foot with the exception of the great toe, and then the young woman was obliged to walk on her great toe. That is the reason she could wear such small shoes. And she has pretty good health, after all, because the feet are not so important as other parts of the body, the kindeys liver, lungs and stomach, for instance. One does not digest with his toes ; one does not breathe with his feet, nor think with his feet. The feet do not have anything to do with circulating the blood, hence they are of comparatively little consequence. One might have both his feet taken off and live a pretty comfortable life, but one could not have a prolapsed stomach, or kindey , and have his internal viscera all tangled up and live a healthy life. Into all these various organs run little filaments from the sympathetic nerve, the most important in the whole body,--the nerves having control of the digestive processes of the whole body, the liver action, the heart action, secretion, and controlling the breathing--this great sympathetic nerve that runs throughout the body controls the circulation of the blood, all the life processes, the processes of growth and repair, tissue-building, tissue tearing down,--the processes of waste and repair. This great nerve sends branches into all these organs, and when these organs are prolapsed, these nerves are all put on a stretch, and cause pain. You can experiment upon this matter for yourselves by pulling upon one of your fingers. Here is the stomach with a

five or six pound dinner in it, hanging down upon these nerves connected with the great sympathetic nerve, the effect being just the same as though you had five or six pounds hanging from the end of one of your fingers. Now here is this six ounce kidney hanging down in the abdominal cavity and pulling on the nerve by which it is attached to the spine, and here is this three pound liver that is hanging down, attached in the same way, and both being connected with the great sympathetic, this produces pain in the small of the back, in the pit of the stomach and also in the top of the head, pain all up and down the spine, palpitation of the heart,--the heart beating very fast-- and a great variety of the symptoms that women complain of . Women will sometimes say to me, "Doctor, I feel as though I was all dragged out." That feeling is caused by this dragging of the stomach, liver and kidneys upon the sympathetic nerve; it is the constant dragging of these internal organs upon the sympathetic nerve that makes all this difficulty. Very often , a woman says to me,"Doctor, I feel as though I must hold myself together when I am on my feet. Another one says, "A pain starts in the top of my head, as soon as I get on my feet; and when I am going around, the more I walk the more pain I have." It is usually supposed that these are diseases peculiar to women ; but there are no diseases that are peculiar to the sex. Women are charged with having feminine diseases. It is not that; it is diseases that are peculiar to dress it is not the sex but the dress which causes this multiplicity of maladies which make civilized women a race of invalids.

(No.) See how this stomach, liver and kidney are hanging down. And here is a case of a poor young woman who had curvature of the spine. This is the result of neglecting to properly develope the muscles of both sides of the body. This young wo-

man did not develop the muscles of the back properly, and hence this hanging down to which I have called your attention. But there is something encouraging to be said to those who would like to turn over a new leaf, and reform :—

(No.) See this great hollow in this figure . This is the sort of figure that our fashionable women have. This woman was afraid she was going to be too fat, so she kept dressing herself tighter and tighter and tighter, because she saw that she was getting fatter and fatter and fatter. As she kept dressing tighter and tighter, this protrusion kept growing bigger and bigger and bigger, and she was ashamed of herself . But she kept binding her clothes on tighter and tighter, and this caused this bulging out to increase more and more, because, by reason of the constriction of the waist, there was less room for the liver, kidney, and stomach, and so they moved down, and other things moved out of their places farther down and farther to the front. Then there was no chance for the fat to be deposited under this tight band; it could not grow there any more than it could grow on the finger under a finger ring. You know there is a furrow on the finger under the ring. For the same reason there is a waist-furrow,-- these strong bands have made it impossible for the blood to circulate very well through these parts, and also have made it impossible for the muscles to contract , and hence the muscles do not use up the material which was brought to that part of the body,-- the material was not consumed in muscle work, and, as nature had nothing else to do with it, she deposited it as fat. These muscles get their share of material to use, and, as it is not used up, it is deposited as fat in this part of the body, and this young woman who made this effort to reduce her abdomen only made it worse all the while. Mrs. Scott Siddons was troubled in this

way, but her dress-maker told her (and it was a strange thing for a dress-maker to say) that she must take off her corset. She did so, and was relieved of her difficulty.

(No.) Now look at this young woman: There is nothing unsightly about this. All that was necessary in this case to make the change which you see here (referring to figures) was for this young woman to take off her corset and develop the abdominal muscles by work, which caused the fat to spread itself over the rest of the body, and so the unsightly appearence entirely disap,-peared, and that is the cure for this sort of local obesity which is a trial to so many women, and which they endeavor to combat by tight lacing, which only renders the obesity more conspicuous.

(No.) This figure represents another reform. This reform occurred in just one year's time. That young woman became this young woman in just one year's time. I am sure you will say this figure is not to be despised. A young woman with this kind of figure has some reason to be proud. But she has no reason to be proud of this figure (referring to figure.) This young woman has developed from this form to this, and besides, she was weak, feeble, wretched, morose and melancholy, and didn't care (as she said) whether she lived or not, but now she is hard at work, enjoy-ing life and doing an immense deal of good . And this is the result of simply adopting those things which have caused a change in her figure and changed her life from a useless, wretched one, to a life which was full of useful aims and purposes.

Now we will consider, if you please, some of the causes which give people these bad figures. Imagine a man sitting up straight in his chair, and that the chair is of the right height and al-lows his feet to rest solidly upon the floor. (Sitting down, and illustrating by different positions) This chair is about the right

height. One cannot sit properly in a chair, unless he sits down properly, and in sitting down properly in a chair you must be sure to stand close to the chair before you sit down. You don't want to sit down in a chair before you get to it; if you do, you are likely to sit down on the front side of the chair,--if the chair does not tip over, when he sits down, he is too far forward; when he rests the back part of the body against the chair, the front part of the body will collapse; the support is so far away that when you get your back against the support, you will have to recline. So the first thing, in sitting properly in a chair, is to sit far back in the chair, so the hips will touch the back of the chair; be sure to do that. Now let the upper part of the body strike the back of the chair; the center of the back does not touch the chair at all; it does not need to do that, because there are some strong muscles which brace up this part of the body. The back is like a bow, and the muscles are like the string of a bow. The string of the bow is in the back, and so the central portion of the body does not want to strike the back of the chair. In order to get it there, we have to loosen the string, so to speak,--we have to relax the muscles and let the back fall down. When the central portion of the back touches the chair, the muscles relax, the chin drops in, and we have a relaxed position. The hips should be placed far back, the upper part of the back touching the chair, and the central part of the back not touching the chair at all. In this position a person can breathe just as easily as when he stands erect and in a correct position.

(No.) Here is a form of bad sitting. This is the kind of bad sitting which causes people to be round-shouldered, and to have a weak and hollow chest. When a person sits in a rocking-

chair, he sits in this position (sitting down in rocking-chair.) This rocking-chair is more like the old-fashioned rocking-chairs , and not near so painful as the rocking-chairs we have nowadays. Here is a better specimen of the fashionable rocking-chair (sitting down in it .) Now, when one sits down in a rocking -chair, of course he collapses. One does not sit down in a rocking-chair; he simply throws himself into it, or drops into it . He does not sit in the rocking-chair, he lies in it, because his back rests against the chair all the way, so I don't think we should say one sits in a rocking-chair, but that he lies down in it . When one takes this position, the whole body is collapsed. Now suppose one should try to sit up straight in a rocking-chair, with his chest well up, and then, sitting in that position, suppose he should try to rock himself (rocking) sitting up straight (laughter.) You see there is no comfort in using a rocking-chair in that fashion,--and you cannot use it in any other way, because, when you are sitting up straight in this way in a rocking-chair the head is strained, and the muscles are strained, because you have to sit up free from the chair, so there is nothing to recommend in the rocking-chair. It is really impossible to sit in a rocking-chair without violating the laws of health. Rocking-chairs ought all to be gathered up into a great pile and fire set to them. I think if we could burn up all the rocking-chairs in the world, it would save a great many people from untimely deaths. There is no question in my mind but what rocking-chair sitting is one of the most common causes of collapsed chests and lungs .

(No.) This young woman is trying to sit straight, but she is having a hard time. See the muscles of the neck,--how they are strained; she is trying very hard to keep straight .

(No.) See how this young woman is collapsed; she is not sitting upon her thighs , but upon her back, and the weight of her body is resting upon the back. This is an ordinary fault. You see young ladies practicing while sitting upon piano stools, in this position. That is the way they become so unhealthy. It is not the music that deforms them --although it is bad enough, sometimes--and it is not the muscles of the arms, but it is the stool-sitting--the bad and incorrect position of the chest.

(No.) This is another bad position,--sitting with the feet crossed. This causes a relax of the whole body; a relaxed position ~~position~~ of the legs causes all the rest of the body to collapse. There is a curious relation existing between the different muscles. Ask a man to pull in his chin, and the moment he pulls in his chin, it pulls the whole man right up in line. There is an associated movement in the muscles. You see a man set his teeth firmly together, and the moment he shuts his teeth he clenches his fist,--and if he does not look out, the fist will go out in a violent way . You see the association of the movements of the muscles is the thing we must take into account. If a person keeps his chin in where it belongs, he can keep the rest of the body straight; The very opposite is true, if this is not done. When one relaxes these muscles, he relaxes other muscles. When one relaxes the muscles of his head, the other muscles follow suit, and a relaxed air pervades the whole man. A great many will get their spines deformed by sitting in chairs which are too big for them. In every family there should be an assortment of chairs,adapted to all ages. There should be a chair for the child as well as for the adult, and the child's chair should be so constructed as to allow the child's feet to rest solidly upon the

floor, and the whole back properly supported. This poor boy is getting a crooked spine .

(No.) Here is a prolapsed kidney, and a dilated stomach with a pouch in it. Here is where it should be, and here is where it is .

(No.) Here is the outline of a young woman who had a good vigorous development. Some of you went to Buffalo Bill's "Wild West " buffalo show, and saw a young woman ride a buffalo. This is that young woman. She had a strong, vigorous development which came from vigorous exercise all her life. You see there is no "corset furrow" there; there is a convex line in front, also a concave line behind. Every woman who has a good , vigorous development, with the muscles well toned up, has these lines.

(No.) Here are some points in bad standing, and correct standing (this seems to be a little overdrawn; perhaps the artist has exaggerated it a little .) At these points the hips and the heels touch the wall, and the back touches the wall here, the heels standing out here, and thus we have a flat chest produced. Here we have the heels touching the wall, and the hips thrown forward.--Here is the correct position (assuming position), just as I am standing now . And here is the incorrect position (assuming position), with the chin protruding, and the back on the same line. And here is the position we see very often when we tell people to stand up straight, and this is the way they will do it (position.) They think they are standing superlatively straight when they take this position.

Just a word about walking . It is as important to walk correctly as it is to stand properly.

(No.) Here is a man walking properly. Instead of setting his heel down in this way, the whole foot is placed upon the floor at the same time, as nearly as possible, and then the whole body is raised from the rear foot. You must not get the idea that the toes must be put down before the heel. Some Delsarte people think they must put down the toes before the heels, and then they must walk in this way (walking in the Delsarte wwy). The foot must be put down with the heel touching the floor just a little sooner than the toe.

These walking attitudes are just a few of a large collection which I have made by snap-shots which I have made. --

No.) This man , I hired to walk for me at one time . He had this sort of teetering gait (walking with "teetering gait.") His whole body was relaxed, and he was just throwing himself along--swinging along. This, (walking along) is called "heel-stepping." You often see people walk in that way in the cities,--swinging their arms as they go (walking rapidly) walking as if they were in a great hurry. This is jarring to the body, and such a person very soon gets tired out, for the whole body is jarred by this movement. If a person walks in this way, his whole body is pendent, as he walks jolting along.

(No.) This young lady has the same fault at this man,-- heel-stepping .The hips are carried so far forward that you have to turn the toes half-way down in order to bring them from the floor at the same time with the heel. When the chest is carried forward, the toes are naturally brought down ....

I have collected a number of specimens of going up stairs incorrectly. I am very often asked such questions as this by ladies, "Do you think it injurious for me to go up stairs?" And I answer , "No; it is the best exercise that I know of, if it is

properly done." I have heard many mothers say their daughters were injured by ~~ruined by~~ going to school, and by going up-stairs. If a girl has been ~~is~~ spoiled by going up-stairs, there was not much of a girl to spoil; the muscles of such girls have not been properly developed. But if such a girl will go up stairs properly she will not be injured, but benefited. Sometimes girls will pick up their skirts and run up stairs, and then they are injured, of course. (They will not be injured if they go up-stairs in a rational way,--and that is the way I am talking about: first put one foot upon the step, standing erect; then raise the body with the calf of the leg, keeping the body straight all the time, and so march along up strairs. If one walks correctly and erect in going up stairs, the weight of the body is carried entirely upon the muscles of the legs. This is a slender stick which I hold in my hand, and yet I might have, on the top of this slender staff, a weight of perhaps twenty pounds, without breaking the staff, so long as I held it straight. So, if we keep the weight of the body poised over the bones of the body, ~~and then~~ the weight of the body then rests upon the bones of the body. But just as soon as you bend over, the weight of the body hangs on the muscles of the back,--as soon as you bend over, the bones are out from under the body. If a person keeps the weight of the body over the bones, the bones ~~will~~ carry the weight, the muscles of the limbs prying the body along. If a person bends over, the weight of the body leaves the muscles of the legs, and the muscles of the back have to carry the lower part of the body in addition to the upper part, and in a strained position; so it is twice as hard to walk up stairs bending over in this way, as it is when walking in this way. (Assuming incorrect and correct positions.) While walking in this

(the correct) position, the weight of the body is on the bones , but when you bend forward , the weight is on the muscles. So the correct method of going up stairs consists simply in keeping in an upright position and carrying the weight of the body on the calves of the legs all the time, rising from one step to another by an effort of the muscles of the legs . In this way a person can go up a long flight of stairs or travel up hill a long distance without injury, and without feeling fatigue . . When you are going up stairs, think of this part of the body, keep your chest forward, and imagine that your chest is drawing you up., instead of going up in this way,--with your body following your head.

(No.) This young woman is going up stairs in this way--bending over, and going up head foremost, and the consequence is, that her head and shoulders hang upon the muscles upon the muscles of the back, and so she has the bachache before ~~she~~ getting to the top of the stairs .

(No.) This young woman is going up stairs in a relaxed fashion.

(No.) Here is Queen Louise walking down stairs in a graceful way, and setting us as proper a pattern as any teacher of physical culture could do.

(No's .) Now look on this picture, and then on this. This is a picture of a woman with a healthy dress; you see these flowing lines have grace and beauty in them. This picture(referring to it) is from a French fashion plate. See these lines: you might think the drapery looks very pretty; these folds are all very graceful and very nice, but just think of what is inside of this drapery, and what a hideous deformity it presents--a mere

pipe-stem in the middle, and an enormous expansion below, and an enormous expansion above,--the poor thing looks as though she would fall in two in the middle .

(No.) Look at this picture. This is intended to teach an important lesson. I hope you won't ridicule it, but that you will look at it in a solemn state of mind, because it contains a lesson which it is important for you to learn. This is one of the healthy figures which we have shown you, with a healthful dress draped upon it (unfortunately it leans over a little, but that does not affect the principle.) You see this dress hangs naturally upon this figure; the outlines of the figure itself support the dress, so that it falls in graceful and beautiful lines ; here you see Hogarth's "line of beauty." The flowing lines are perfectly natural. When the simplest kind of dress is placed upon a normal figure, the figure itself gives the proper form to the dress and cause it to assume these graceful lines .

(No.) Now look at this figure. This is not a manufactured figure, but a real figure. This poor woman found her figure increasing in size, and she is trying to keep her figure down. She was like a young woman who came up from Chicago; she had been at our training school. She hadn't been here over half an hour before she said, "Your nurses don't wear corsets. I don't see how they manage to keep their stomachs down. I would be a perfect fright if I didn't wear a corset. Now this is the poor woman who "kept her stomach down." (Laughter.) Well, her stomach was down, sure enough,--it was away down here (indicating position.), and the process of getting her stomach down had spoiled her figure. You don't see these deformities on the other figure; there is no such thing belonging to a normal figure of either a man or a woman; it is a monstrosity and a deformity.

and an abnormality in a figure. Now this woman knows that these expansions are deformities and monstrosities, and so she keeps pinching her figure up at the waist, and that makes it bigger and bigger here (in the abdomen), and she must hide this deformity in some way, and the fashion-makers and the dress-makers go to work to help her to hide it . Now, in order to cover this protrusion here, there must be something above here to match it, otherwise there would be an objectionable sort of declivity in this part of the body--an obliquity of line that would not be agreeable, so there must be an appendage up here, and this appendage up here, balances this protrusion below, and hides that prominence. Now see what a figure this would be,--with the dress hanging straight down behind, and hanging as you see it does in front. With such a figure as that, this woman would excite derision and be very unhappy, so the poor woman must have something in the rear to balance the protrusions in front , and cause the dress to hang, in the rear, something near as it would on a normal figure,--in other words, she must have a "bustle,"- and this is the origin of busts and bustles. This is the attempt of the fashion-makers to restore the deformed body to something like normal symmetry. There is a natural hollow in the back, and the fashion -makers know it. They first go to work with great persistency to destroy the natural concavity in the back which you see in the normal figure of a horse as well as a woman. If a horse had not this concave line in his back, if his back was as straight as a fish-pole, you wouldn't buy him. You want a horse with a fine curve in his back , rising from the hips. Most mammals have that kind of figure, and a horse having a back as straight as a fence-rail is not worth much. So, if a person has a perfectly straight back, while walking, it is an evidence of

weakness,--it is an evidence of disease in a woman--it is as unnatural in a woman as in a horse, and so fashion abhors this straight line (which is made by fashion,) and, in order to match this great hillock in front, they have to put on this great bustle in the rear. (Laughter.) This, you see, is a recognition on the part of the fashion-makers that they have done the body a damage and an injury with the corset, and now they are doing their best to make it up by these appendages, but it is not so beautiful as the original figure. Now ~~it~~ is ~~that~~ sort of dress that looks well with that sort of figure.

(No.) This is from a photograph of a modern painting, and shows you what sort of figures artists make their paintings from. If an artist is going to make an undraped figure, he makes it with these flowing lines.

(No.) Here is another figure from a modern artist. You see they all make such figures as I have been showing you. No artist would think of making an undraped figure with a great ~~hill~~ hillock here, and a great hillock there,--such as the fashion-makers manufacture .

(No.) This is a figure that I took in Paris. This young woman posed for such figures as this. She was not allowed to wear a corset, because her employer would have discharged her if she had. It seems that the artist was tying up his poor wife with the smallest kind of French waists, but he made his beautiful paintings from a normal figure.