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1895

"HAS

PASKOLA

DIGESTIVE PROPERTIES?"

ANSWERED.

New York, August 27th, 1895.

Chas. H. Stowell, M. D.,

Washington, D. C.

Dear Doctor:-

You are doubtless familiar with our preparation, Paskola, which is advertised in your journal, The National Medical Review. You also probably know that we publish the formula of this product on each bottle, and there any one can see that we claim Paskola contains, among other things, proteid digesting ferments, (pepsin and bromelin), and hydrochloric acid in definite amounts. Now, theoretically, we cannot understand why such a mixture should not digest meaty foods when subjected to the conditions of normal digestion. Practically, in our own laboratory, we have demonstrated this time and time again. However, there appears to be a disposition, in a certain quarter, to dispute these statements. Therefore, having been familiar with your physiological work when you were connected with the University of Michigan, we desire to engage your services to make a series of conclusive experiments on this point. We wish you to test the question in every way, to your own satisfaction, whether or not Paskola has digestive properties.

Please let us know by return mail if you can do this work for us, and, also, when you can take the time from your numerous duties sufficient to begin the work. Trusting we shall have a favorable reply from you, we remain,

(Signed), THE PRE-DIGESTED FOOD CO.

(Copy).

Washington, D. C., Sept. 12, '95.

A. J. White, Esq.,
30 Reade St., N. Y.

My dear Sir:-

I have thoroughly tested the question of the digestive properties of Paskola and submit the following detailed report:-

A few general statements will save much repetition in the text. (1) The experiments were performed in flat, pint bottles; as these are better for photographing. (2) The water bath was maintained at a temerature between 102 and 104. (3) During digestion the bottles were frequently agitated. (4) "Aciudated water" was made by adding 40 drops of c.p. hydrochloric acid to the pint. (5) The egg albumen was prepared by placing the eggs in boiling water and the boiling continued for fifteen minutes. They were then placed in cold water; and, later, the whites were finely divided.

Experiment No. 1.

Two ounces of finely chopped, lean beef were divided into two equal parts. One part was placed in a bottle (A, Fig. 1) with one-half ounce of Paskola and the bottle filled with acidulated water. The other part was placed in a bottle and the bottle filled with acidulated water only (B, Fig. 1). After remaining in the water bath between six and seven hours they were removed, the contents allowed to settle until morning, and then photographed. The illustration of the first specimen shows no deposit whatever, although an inversion of the bottle shows some granular matter undissolved. The half ounce of Paskola digested the ounce of lean meat. The illustration of the second specimen shows the meat still undigested, although an examination of the specimen shows that the heat and acid have softened the meat. Both specimens show considerable fat floating on the surface.

Experiment No. 2.

One ounce of the finely divided egg albumen was placed in a bottle and the bottle filled with acidulated water (A, Fig. 2). Another ounce was placed in a bottle with one-half ounce of Paskola and the bottle filled with acidulated water. Both bottles were placed in the water bath for nearly seven hours. After the contents were thoroughly settled, the specimens were photographed. The first preparation (A, Fig. 2) shows the albumen unaffected by the acid water. The masses, as seen in the illustration, are aggregations of the minced albumen; the actual size of the individual particles, therefore, is not so large as one might think by examining the illustration. The second specimen (B, Fig. 2), shows a small deposit at the bottom, on one side. The glass was depressed here and nearly all the undigested albumen settled on this side; although a faint white line is seen across the bottom. The illustration shows the individual particles of undigested albumen; while, by inverting the bottle, it is noticed there is a small quantity of granular matter still undissolved. The half-ounce of Paskola nearly digested the ounce of albumen.

Experiment No. 3.

5' One ounce of the egg albumen was placed in a bottle with one-half ounce of Paskola and the bottle only half filled with the aciaulated water (B, Fig. 3). After remaining in the water bath for fully seven hours, and after settling over night it was photographed in the morning. The illustration shows that the upper surface of this deposit is granular, thoroughly broken to pieces but not dissolved. The lower part shows the small pieces of albumen clearly. A, and C, are the same as those in Fig. 2 and are placed here to show the contrast. The difference between A and B is seen to be very marked. The conclusion is that digestion was not so complete in this specimen as in the last, because of a small amount of water. The water becomes charged with peptones and will not take up more. This is accoraing to a well known physiological law.

Experiment No. 4.

Into each of three bottles was placed a dose of Paskola, "one tablespoonful." Into the first (A, Fig. 4) was placed three-fourths of an ounce of the egg albumen: into the second (B,) one ounce: and into the third (C,) two ounces. The bottles were filled with the acidulated water and allowed to remain in the water bath for about seven hours. After the contents had completely settled, the photograph was made. A, shows complete digestion; with the exception of a few flakes which show clearly in the lower left corner of the photograph. As these are almost invariably left in all digestion experiments of this kind so it is entirely proper to state that a dose of Paskola digested three-fourths of an ounce of egg albumen. An examination of the second specimen (B,) shows that the deposit consists of the finest granular matter. By shaking the bottle, the deposit can be so evenly disseminated through the mixture that it appears to be all dissolved. An examination of the deposit in the third specimen (C,) shows that the upper part consists of this fine granular matter, while the lower part contains small pieces of undigested albumen, as the illustration shows. While digestion was not complete in the last two specimens yet the change in the albumen is very marked.

Experiment No. 5.

Learning from a previous experiment (B, Fig. 3) that a concentrated solution will check digestion, and as this was likely the case with the last experiment (C, Fig. 4,) the following experiment was tried: The bottle which contained two ounces of egg albumen (C, Fig 4,) was agitated and one-half of its contents poured into another bottle; and each bottle filled (or, as the illustration shows, nearly filled) with acidulated water. These were placed in the water bath in order that the digestive process might continue a few hours longer. At the same time the other specimen (B, Fig. 4) was placed in the water bath. The result was most gratifying. The illustration shows (A, B, Fig. 5) that the single dose of Paskola has practically digested the whole two ounces of egg albumen, with the exception of a small quantity, represented by a white line (B, Fig. 5). The specimen containing the ounce of egg albumen (B, Fig. 4) now, after longer digestion, is shown to be completely free from any deposit (C, Fig. 5). The dose of Paskola has completely digested the ounce of egg albumen.

Experiment No. 6.

A small quantity of the contents of the last bottle (C, Fig. 5) was removed. The remainder was made neutral, or left slightly acid, by adding caustic potash. A solution of tannin was then added, when a heavy precipitate immediately occurred. Even after standing a few hours, the precipitate had not settled below the middle of the bottle. But by morning, when the photograph was taken, the precipitate had fallen to the extent shown in the illustration (Fig. 6). This represents the original egg albumen, now in the form of ~~a peptone~~ albumose.

LABORATORY OF HYGIENE

of the

BATTLE CREEK SANITARIUM.

J. H. Kellogg, M. D., Superintendent.

Special attention devoted to original research.

Battle Creek, Michigan,

Five years ago the Directors of the Battle Creek Sanitarium, in harmony with their philanthropic and scientific objects of the institution, to which all its earnings have been devoted, authorized the Superintendent, Dr. J. H. Kellogg, to organise a Laboratory of Hygiene for original researches and practical investigation in connection with the institution. By the aid of the liberal appropriation made for apparatus and the fitting up of suitable laboratories, and the invaluable assistance rendered by Professors Gomberg and Novy of the University of Michigan in the development of the chemical and bacteriological departments, especially in the training of assistants and the organization of the work, has made it possible to place this enterprise upon a thoroughly scientific footing. There are probably few laboratories which have done a larger amount of original and practical work than has been done in this laboratory during the last four years. The laboratory is not devoted to instruction except incidentally, but keeps constantly employed in chemical and bacteriological work, from five to seven persons in practi cal and experimental work.

Special attention has been given to the investigation of disorders of the stomach by examination of the stomach fluid. An extensive examination is made by the exact methods developed by Hayem and Winter and other investigators, including some very practical and interesting methods which have been developed in our own laboratory as the result of

of the extensive work which has been done. The determinations made by the methods of investigation employed here are more complete and thoroughgoing than have ever been undertaken elsewhere, and includes a bacteriological as well as chemical examination. This may be readily seen by the blanks which are herewith inclosed, every detail of which is carefully worked out for every specimen of stomach fluid examined, provided, of course, that the quantity is sufficient.

We need not urge the advantages of exact methods in the study of disorders of digestion. Every physician is ready to appreciate the value of a method which will enable him to recognize at once the therapeutic indications as regards diet and medication instead of leaving him to determine these by the vexatious method of experimentation. The great drawback to the general adoption of exact methods is the necessity for a laboratory and well trained assistants able to make with precision the distinct manipulations necessary for the investigation of each individual case. It is not possible for every physician to maintain a laboratory, neither has the ordinary practitioner the time the time to devote to the tedious laboratory manipulations necessary in researches of this sort. The great amount of interest shown by physicians in the work of the Sanitarium Laboratory of Hygiene, especially in the investigation of disorders of digestion, has suggested to us the propriety of tendering the services of the laboratory to members of the profession in this particular line of research, for which this laboratory is, perhaps, more thoroughly equipped than any other in this country.

The method pursued in general is this: The patient is given a test meal which, at the end of an hour, is withdrawn from the stomach by a stomach-tube. The fluid is then subjected to careful quantitative and qualitative chemical examinations. The examination is also microscopical and bacteriological. Physicians who desire to have an examination of

this sort made for their patients have only to send a postal card to the undersigned expressing their desires, and will receive by mail a tin case containing the test meal, a stomach tube of approved form, a bottle for the fluid obtained from the stomach, careful directions for administering the test meal, etc. As soon as the stomach fluid is received at the laboratory, it will be carefully examined and a report returned with a full explanation of the result and suggestions as to the dietetic and other therapeutic indications.

The fee charged for this service will be $5.00. This does not include return postage or express charges. Examinations will be made for physicians ot members of their families without charge. Free examinations will also be made for persons who are unable to pay.

Communications should be addressed to the undersigned.

J. H. Kellogg, M. D., Superintendent,

Laboratory of Hygiene,

Battle Creek, Mich.

SANITARIUM STEREOPTICON LECTURE. Jan. 27, 1895.

The Man Wonderful in the House Beautiful

J. H. Kellogg, M. D.

----oOo----

Good evening, Ladies and Gentlemen: It is better to be heard than seen, (lights out,) and so I am here to-night to talk to you about The Man Wonderful in the House Beautiful. The house is not always as beautiful as it ought to be, but the man is always wonderful. I will not undertake to tell you all about the anatomy of the human body, nor all about the physiology of the body, or the wonderful functions of the diverse structures of what we call the body, but I presume what I shall show you upon the screen will be sufficient to bring forcibly to your minds the idea that the human body is the masterpiece of the divine Creator.

A number of years ago I visited Rome and other places of interest in Italy, and the various galleries and museums in which were collected works of art which represented the arts of all ages from the early Greek ages down to the present time, and I found in an old church in a remote part of the city in a dark and secluded corner of the church, hidden away behind a dense curtain, a wonderful picture. As the guide raised the curtain and disclosed the marvellous picture, he said, "There you behold the masterpiece of Michael Angelo." It was his famous picture of Moses. It is certainly a very remarkable piece of work, for it looks marvellously like a human body. Those eyes look as though they could see and that mouth looks as though it could speak, and it really seemed

as though the picture stood right out from the canvas and was really alive. Then I thought, "Suppose some one should discredit it and should throw dirt upon this picture, or should mar it with charcoal, or should daub it with mud,--" every one would cry out in execration of such a deed. And yet this is only the shadow of a man. Now the human body, as I have said, is the Almighty's masterpiece. (Screen.)

Breast Here upon the screen you see the skeleton, the framework of this masterpiece, consisting of about two hundred bones,--some reckon a few more and some reckon a few less--which constitute the sleepers, and rafters and mainstays, etc.,of the human body. Now as you look at these bones, they look very uncouth and ugly,--this bone, for example. See these angles, ridges and depressions You see these dark places which represent the depressions. Notice these elevated places swelling out at one point and the drawing in at another point. Perhaps some of you may think these irregularities are a matter of chance, but when you come to the study of the anatomy of the muscles and to notice the realtion of these muscles to the bones, we find that every one of these irregularities has an important function of its own: Each one of these prominences is the point of attachment of a muscle or a tendon of a muscle. And between these little openings that you see (there are several of them)--between these little holes that you see in the bone are places where the bloodvessels pass in. And all these different parts and all the different variations in the contour of the bone all mean something. Every one of these bones requires efforts of comprehension and understanding,--

days and days of careful study. The significance of each one of these bones is so great that the skilled anatomist finds in one bone all that is necessary to enable him to make the whole picture of the animal from whence it came,--and not only that but the life history of the animal. It is said of the late Professor Agassiz that he was first brought to the notice of scientific men by the following incident: He was at one time before a large association of biologists,--comparative anatomists--men who make it their study to understand the anatomy of men and animals , and they were discussing the probable outline of a certain animal, some of the fossil bones of which had been found. Agassiz was present, and they had heard of his skill in determining what class an animal belonged to by examining one of its bones, and they asked him to make a picture of the animal to which this bone belonged,--it was only a single bone of a dead animal. He stepped up to the blackboard and drew the skeleton of the animal to which the bone belonged. Not long afterwards another skeleton like the one which he had drawn was found, and was found to correspond exactly with the picture he had made of the animal's skeleton.
(Screen.)

Here we have a large picture of a skull. Here you have a better idea of the various depressions and elevations, the sinuses and seams which unite to form the face. Here is the depression of the eyes, and here are the places where the nerves and the bloodvessels go through to supply the eyeball. These prominences represent the bony places of the nose.. Here is where the air passes through. Here is the bony partition of the nose. Here is the vomer; and here is where the teeth are set in

the skull. These various depressions represent the attachment of various muscles of the face. Every phase of the skull is interesting. Now you can see the picture very clearly. This is intended to illustrate the muscles of the face. Here you have a view of the more superficial ~~view~~ of the muscles. And here you have a view of the deeper muscles. Notice this muscle at the top,--this is the occipito frontalis muscle. This is a tendon in the ~~medulla~~ Medulla--although usually the muscle is the fleshy part in the ~~medulla~~ Medulla,--I don't know but it is a sort of skullcap covering the upper part of the skull; the fleshy part is found on either side. By means of these muscles a person wrinkles his brow,--in doing it, he contracts these muscles. Here are three very curious little muscles,- here is one in front; here is one behind the ear; here is one above the ear. These three little muscles are supposed to be intended for the purpose of drawing the ear backward and forward. I remember when I was a small boy, I was very envious of a boy who was sitting in front of me at school and he was able to wiggle his ear, and I couldn't wiggle my ear, although I tried every way to make my ear move backwards and forwards But the horse can work his ears. I shall never forget a sight that I saw in Chicago,--a donkey with his load in the crowded street and vehicles etc. constantly coming and going, and this donkey marched along with one ear drawn backward and the other ear thrown forward. That donkey proposed to know all that was going on. It was very convenient for the donkey to be able to work his ears in this way, for he was thus prepared to catch every

sound. Since I have grown older, I don't feel anxious to be able to move my ears,--although in reading Darwin, I find the claims that there are vestiges of a race of men left who sit in tree-tops and brush the flies off their noses with their ears,--(laughter) but I don't believe that--I don't think the ears of mankind were ever as big as that. But these muscles are there, and what they are there for nobody knows; but it is a very interesting fact that it has been found for many generations back that in the human being these muscles are there . (Screen.)

muscles But here are muscles which even children can understand,--for instance this muscle which is attached to one end of this bone and the other end down here,--I suppose this great muscle (the cremaster muscle) helps in mastication,--it is the masticating muscle; it draws the jaw shut, and also draws it towards the other jaw--the upper jaw; it is used in mastication. Here is another muscle attached to the corner of the mouth; it draws the corner of the mouth away back,--that is the laughing muscle--the zygomaticus major muscle. When a man laughs the corners of his mouth are drawn back by these muscles. Here is the zygomaticus minor back here; that is the weeping muscle; when that muscle contracts it puts the lips into a different shape from what they were Now all the difference between weeping and laughing is, that when we weep the corners of the mouth are pulled down; and when we laugh they are drawn up. Your feelings are goverened by the use of your muscles . When you draw the corners of your mouth down it makes you feel morose and sad, and when you draw them up you feel hilarious and like laughing,--even although there is noth-

ing to laugh at . Here is a muscle that contracts and shuts up the eyes--this is the orbicularis palpebraeum. Here are the corrugator muscles,--and here is the levator labii superioris alaeque nasi,--the muscle that lifts the upper lip and the wing of the nose when you wish to look scornful. These muscles are for the purpose of puckering the eyebrows. These are the scolding muscles.

These muscles of the face are really the most marvelous muscles of the body,because they are connected with the brain and have such power of expression. Of course all the muscles connect with the brain,--for instance, when one opens and shuts the hand, the muscles are connected with the brain which causes the hand to open and shut. When a man shuts his hand in this way, you see there is a bad thought in his brain; but when he holds out his hand in this way, there is a different thought in his brain. Now there is expression in one's hand, --there is a remarkable amount of expression in the hand, but in the face we have the most marvelous arrangement of the muscles for expression that we could have in nature. Watch the expression in a child's face. I have watched the expression of a child's face even when he is dreaming,--it is something really interesting to watch the expression of a child's face when he is listening to an interesting story for instance; watch the play of the child's features as the various incidents of the story are related; there is something intensely interesting in the expression of his face. This is simply because of the attachment of the muscles of the face to the brain. The scorning muscle, for instance, is connected with that part of

the brain in which scornful thoughts are stored up, and when these thoughts are called into play the zygomaticus major muscle contracts the corner of the mouth up towards the ears,--that is connected with the mirthful and cheerful part of the brain. But the zygomaticus minor ~~elator~~ muscle which draws the face into an appropriate form for weeping,--that muscle must be connected with the mourning thoughts of the brain, or that part of the mind in which mournful thoughts are stored up. Here is the trumpeter's muscle which fills up the cheek,--all these are very interesting muscles of the face. But it is a fact that these muscles are so connected with the brain that a person's thoughts can be read in his face. If a person is happy you know it by the muscles of his face. If he is sad, the sets of muscles thatpull the face into a shape to represent sadness are brought into play. When a man is angry his face shows it. When a person's mind is filled with thoughts of pity his face shows the pity that is in his mind; so of all these muscles of the face. They are constantly drawing the face one way or another to represent the conditions of the mind. One lady once said to me, "Doctor, how shall I get rid of these wrinkles?" Now I have noticed that there are certain wrinkles that persons are anxious to get rid of, while there are other wrinkles that they are not ashamed of and are not anxious to get rid of, -the horizontal wrinkles; but persons having these perpendicular wrinkles are sometimes very anxious to get rid of them. This lady, once said to me, "Doctor, I have come down here to see you and to have an operation performed." "What sort of an operation do you want. "Why," said she, "you see what I need to have done. " I said I didn't see anything that needed to be done,--"Where is the trouble?"

"Why, in my face." I said I didn't see any necessity for an operation there. "Why," said she, " don't you see my nose?" I told her I saw her nose, but that I didn't see anything the matter with it. "Now doctor," said she, "I don't want you to make fun of me. I've come here to have my nose fixed." "What's the matter with your nose," I asked. "Now doctor, I don't want you to ask me such an embarrassing question,--I want to have my nose fixed." "Well," I said, "I don't see anything the matter with it. "Why doctor, my nose is an awful looking nose; and people stop and look at me as I am walking along. I want my nose fixed so that it will be a good looking nose." Said I, "What kind of nose would you like to have,---a Roman nose or a Grecian nose?" "Doctor, don't bother me in this way,--I want you to fix my nose." "How do you want me to fix it?" "Why, you see it sticks right up into the air , and I want you to put it in the right shape .--just as it ought to be." "But," I said, "you will have to tell me what kind of nose you want, because I might make a wrong sort of nose for you." She turned her head away appearing as though she was very much offended. Then I said, "You are mistaken about your nose ,--your nose is all right; your nose is just a fit for the rest of your face . (Laughter.) Well she hardly knew whether to take that as a compliment or not, but I said, "Your nose is all right; it fits your face exactly. Now suppose I had all kinds of beautiful noses lying here on this table,--Roman noses, Grecian noses, and other noses that you would think were exquisitely beautiful, and if I were to put one of these noses on your face, it would not match the rest of your face. Nature knew what kind of nose fitted your face, so she has given you a nose which per-

fectly harmonizes with the rest of your face,--with all thelines of your face--and I wouldn't dare to touch it for fear I might destroy the unity of the lines of your face." "Well, Doctor, I said, I see you are morbid to-day. I will call again." But she didn't come again. And yet what I said to her was correct: of course a nose that would fit one countenance would not fit another. . I have seen cases of persons who had lost their noses, and who had had them replaced with others,--but they didn't fit. (Screen.)

This is a side view of the same picture: This gives you a better view of the muscles. There are five hundred muscles in the body, and by the use of our strength-testing apparatus we test twenty different groups of muscles of the hand and arm, and generally these groups are made up of soft muscles. Now see how the muscles of the back are arranged. Here is this great muscle which pulls the arm down to the side. Here is the great trapezium shaped muscle in the back,--attached to the shoulder and running back here--the trapezius. Here are the rhomboid muscles which draw the shoulder blades back. Here are the large muscles covering the cap of the shoulder and raising the arm,--the deltoid muscles. Here are the muscles of the legs. Here is the large corresponding muscle--the gluteus maximus,--it corresponds with this muscle. Here we have the upper extremity muscles which correspond to the lower extremity muscles in what is called the homologous muscles, which correspond with each other.

Here are the muscles which press the shoulders in front,--the pectoral muscles. Here are the long muscles down here, by means of which the tailor, ~~by means of which the tailor~~ is enabled to adjust his limbs under him,--the sartorius muscle.

Every one of these muscles are made up of minute fibers, each of which contracts independent of the rest of the muscles. Here is the thorax, and twelve ribs on each side,--the seven true ribs (attached to the spine and sternum, the three false ribs joined to the last rib by cartilages, and two ribs having no cartilage at all--the floating ribs. The purpose of this arrangement is to give the chest an opportunity to expand below; at the same time it gives the fashionable woman an opportunity to constrict her waist because the ribs are not so firmly braced there as at other points. (Screen.)

Spinal Column

Here is a structure which I wish you to look at ,--this is the wonderful structure the spinal column; it is made up of joints. There is a joint at each one of these little vertebrae; these vertebrae constitute this column. Each one of these is a separate bone with a ring in it. They are all joined together in a most wonderful fashion, and all forming a solid column upon which the body rests . A little distal cartilage is placed between the joints of the vertebrae,and this is elastic or fibro-cartilage,--and by means of the elasticity of these, the whole weight of the body can be received and the jar which would be received in walking is deadened. This fibro-cartilage becomes compressed as we walk upon our feet. When a person is far advanced in years,this cartilage becomes thin, and so he gets shorter as he grows old. He may lose half an inch in a day. A certain huntsman lost two inches in height in one day; the effort to which he was subjected was so great that he became two inches shorter than he was before.. So we are a little longer in the morning than we are at night.

So if you want to be measured and have the benefit of your full height, be measured in the morning. (Screen.)

Then these beautiful curves of the spinal column are of great interest. By means of these curves the force received on striking the ground is conducted off along these different curves into space so the force of striking the ground is lessened. Down at the knee joints you have two great bones coming together, and so arranged that great pressure can be received upon them; it is an interesting thing that so great a pressure can be received upon these bones. Now suppose for example you should lay your finger on the ground and should let some one step on it,-- you would ask him to move away as soon as possible. Then suppose you should put your finger below your knee joint and then fall upon your knee with your finger under it,--the weight would be so great that it would be intolerable, and the finger would die if left there long. Now why is not the knee injured in the same way? That is something that nobody can fully explain, but these structures have been so constructed--they have been so formed that they are capable of resisting this pressure; they are capable of sustaining great pressure and the delicate cartilage that covers the joint is continually being moistened;— the knee-joint secretes a lubricating fluid which renders the joint moist and lubricates it in a most admirable manner.

Here is the knee-cap. Here are the ligaments connecting the parts of the knee. Sometimes a little concretion or little cartilage forms and slips into the knee joint so as to lock it. I had a patient with such a floating cartilage in his knee; he was

a railway conductor; sometimes his train was starting and he would try to jump aboard, and this little cartilage in his knee would slip into the joint and lock it so that he could not stir, except by hobbling along on one foot. But it was not a case in which nothing could be done. A little incision was made and the cartilage was removed and he was relieved.

Here is a half of a tooth,--a split section; you can see the section of the tooth and the marrow inside; it is filled with living matter called the pulp; there are no nerves here,but there are fine canals into which the nutrient material finds its way. Here is a picture of the enamel covering the outside of the tooth; that is the way it looks under the microscope--made up of hexagonal plates.

One of the most interesting portions of the body is the nervous system. Here are two very important sets of nerves,--one is the nerves of motion and the other is the nerves of sensation. (Screen.) Here is a vew of the nervous system as a whole . Here is the brain at the top. Here is the spinal chord and here are the branches running off on each side. An interesting thing to notice is that there are large masses in the region of the neck. These large masses go to supply the arm. In the same manner, at the lower portion of the spinal chord there are found other large masses which go to supply the nerves of the legs. But this does not give you any idea of the movements of the inner structures of the body. If you should take away from the body everything but the nerves--if you should take away the bones, muscles, and bloodvessels and flesh, the nerves would still represent a perfect human form, they are so numerous. (Screen.)

Here is the brain and the spinal chord,--here is the brain alone--the right brain and the left brain; there are about a hundred and fifty trillion brain cells in them and each one of them is able to assist in the formation of an idea or a sensation or an impulse. The cells can think--the nerve-cells can think. All these little sulcii that are formed by the corrugated surface of the brain deep down--a layer about an inch in thickness--which is made up of a great number of successive layers of brain cells. The front part of the brain is supposed to be devoted to thinking; the middle postion is devoted to the control of the muscles (the motor area), and the back part of the brain has chiefly to do with sensation--sight, smell, taste and touch. (Screen.)

Here you see at the lower part of the skull the little brain; and there is the top of the spinal chord,--this shows the gray matter of the brain on the inside; there is the larger portion on the outside. It is an interesting thing to know that every one of these little areas has its name and property. The geography of the brain has been so well studied that it is known that each one of these small areas has its peculiar property, and that property is known and it represents a certain function of the body. (Screen.)

Here is a view of the fifth nerve; the branches go to the teeth, ramifying very extensively all over the face. I suppose most of us are more or less acquainted with this nerve; we have had some experience with the tooth-ache,--if it were not for the fifth nerve we would not be troubled with the tooth-ache. (Screen.)

Here you see the lungs and the heart. The heart sends arteries large veins into the lungs and receives veins from the lungs. Here you have an idea of this double circulation,--here is the large vein through the blood is brought back--the large artery,

rather--and here is the large vein through which blood is received from the lungs; the lungs act as a pump and pump blood into the heart and the heart pumps blood into the lungs. (Screen.)

Here we have bones ; this is one of the most interesting things to be seen . This is the minute structure of a bone. When a bone is laid under a microscope you see large spaces in it, as you see them here, and little branches. Each one of these little spaces (or lacunae) may be compared to a little creature called a bone-cell; it is a cell, but it is as much an independent creature as a fly, a fish or a bird, and it performs its function in taking care of the bone and keeping it in order. (Screen.)

Here you see the section cut the other way--here you see large canals in the bloodvessels. Here is a portion of a blood vessel magnified. Each of these muscles, as I have told you before is made up of fibers, and each fiber contracts independently (Screen.)

Here are some of the cells of which the whole body is composed the whole body is made up of the cells which enter into its structure in various ways, and are associated together in performing the various functions of the body. Here are some small cells; here are some small nerve cells,--here is another nerve-cell; here is a larger nerve-cell, and here are some of these branches running off to form nerve-fibers. Here is a ganglion, and here are nerve-fibers running off from the ganglian, , the cells being sent off to various parts, of the body, and these connect the nervecells with every organ of the body. This large cell, you see, looks very much like a portion of the spine,--when veiwed through the microscope y u see the cells look exactly like that. This is a portion of the spinal chord; this is the

white matter and this is the gray matter of the spinal chord; the central portion of it contains some of these cells. Some of the cells are useful for some purposes and some for others; the fibers run out to other parts with which the cells are connected. The posterior of the chords are devoted to sensation and the anterior to motion. (Screen.)

Here is a portion of the ear ,--looking up. Here is the canal of the ear through which the sound passes down to be received upon the drum-head of the ear . Here is the series of bones connected with the drum-head,--here is a portion of these bones--you dan see different parts of them. Here is the stapes,--it looks like a stirrup, so it is called stapes--the anvil bone--and here is the malleus--here is the hammer or mallet. There is another little bne connecting the two together--the orbicular bone. The bones are all joined together in such a way that you have here this lever acting upon this bone and this bone sending out a long arm which acts upon this one; by this means this delicate movement at this point will cause a motion over here, and by means of muscles which connect with these processes here,,the tension being controlled perfectly ; if there should be so great a disturbance of the air as is likely to make so great a tension of the drum of the ear as to injure this delicate inner portion of the ear then the hammer releases the muscles which lets control these bones and them so as not to transmit so forcible a blow; when you get ready for a loud sound, it don't hurt you,--you know it is coming, you get ready for it and you are not injured by it, but if you don't know it is coming it hurts you. That reminds me that people who are in the midst

of a cannonade or who are blasting or in any work in which there is a loud sound, almost always take pains to prepare themselves beforehand. This precaution which they take as of importance in these cases for protecting the ear, for an unexpected sound is very likely to produce serious injury to the ear . So children should never be allowed to shout in their playmates' ears; they should not crack whips or fire off crackers near the ears of other children. (Screen.)

Here is a picture of the eye; this will give you an idea of how a picture is formed in the eye. Here is an arrow above here, and this arrow is pictured upon the back side of the eye-- upon the retina. Now it is not simply pictured there as a picture of some one seen in a mirror, but it is photographed there. You go to a photographer to have your picture taken and you know that he prepares a glass by certain chemicals so that when your picture falls upon that prepared glass the result is to produce a chemical change by which your picture is indelibly impressed and fixed there. Now that very same thing happens in the retina of the eye-- only the reverse takes place from that of the photograph, the membrane which lines the back of the eye being dark colored the rays of light are fixed, forming the image, and the lines of the picture are bleached upon the retina, thus forming the picture. Now suppose an ox dies with such a picture in his eye, and you immediately cut out the eye; you can see this picture upon the retina of the eye. This picture, however does not remain very long, and if you allow the sun to shine upon the eye the picture will soon be obliterated; so the eye picture cannot be utilized in any way. I saw in a paper an account of the fact that the eye of a man who had been killed had been taken out and saved to be examined to see the

picture. It was thought that it was possible to discover who killed the man by looking into the eyes, but such a thing is quite preposterous. It shows, however how far advanced a state of civilization would be that should adopt such means as that for the conviction of a criminal,--and yet I suppose an ordinary Philidelphia detective on looking into such an eye could see almost anything that he wantted to see. (Screen.)

Here is a very interesting diagram of the circulation. This represents the left heart, and this represents the right heart. Every one has two hearts,--a right heart and a left heart, as also have some of the lower animals,--the dugong and the manatee; in these animals the separation between the right heart and the left heart can be readily discovered. The frog has, besides his heart to pump the blood, two or three other hearts with which to pump the lymph. In the human body we have two hearts, but they are bound up in one bundle; they are not very easily distinguishable, but Seifert brings out the fact that we have two hearts, one pumping the blood into the veins which carry it to the right heart, and then from the right heart it is pumped through another set of vessels into the lungs to be purified, and after it has been purified in the lungs it is carried by another set of veins to the left heart to be again pumped out and distributed through the body. (Screen.)

Here we have a representation os some portion of the alimentary canal. Starting from the mouth we have thirty feet of intestine and seventeen square feet f stomach. Here is the mouth; here are the digestive organs as they are arranged within the abdominal cavity. Here is the stomach; here is the pyloric office; here is the cardiac orifice; here is where the food enters,

here is where it passes out. Here is the liver, and here is the colon but the way in which the organs are arranged here is not exactly right. Here they are more exactly represented. Here is the omentum hanging down in front; when a person becomes very fleshy his omentum sometimes becomes several inches thick; ordinarily it is a very delicate membrane, but sometimes it becomes very thick. (Screen.)

This represents the stomach. Here is the liver turned up so you can see the gall-bladder and the different vessels passing into it; the pancreas lie behind the stomach. (Screen.)

Here is a section of the liver; this shows you how the liver makes bile; the blood comes into the liver and it circulates through all these little channels and comes in contact with the delicate lining cells, and each cell is capable of making bile and storing up staech, and as the blood comes in here it flows off after the bile has been separated, in another set of vessels. We have two sets of arteries--the portal vein and the hepatic artery--then we have the lymphatics and the bile-ducts. (Screen.)

Here is the skin. This is the thick epidermis; here is the pigment layer; here is the true skin. Here is the sweat glands,-- the a little coil represented on this wave-line, passing down to the surface. You have here a portion of the sebaceous glands which manufacture fat with which the surface of the skin is oiled (Screen.)

Here we have a representation of the same glands. Here are the glands which make the gastric juice; here is a group cut cross-wise. Here you can look down into them. This is an

elegant representation of them; here you see the cells by which the gastric juice is made. (Screen.)

This represents the circulation of a frog's foot; if you look at the thin web of a frog's foot you can see the corpuscles trooping through the vessels,--you can see this better through a microscope. (Screen.)

Here is an interesting representation of the cells of the kidney, and here we have represented the bloodvessels, and as the blood is circulated through this little sac the watery secretion is taken out and taken down through this canal, and in that way the poisons are filtered out of the body. (Screen.)

Here are some curious little cells that we find in the respiratory passages; here are the columnar epithelium and the ciliated epithelium; this is attached by this delicate filament to the mucous membrane; that is run down to the basement of the membrane, and on the top of each of these little cells are hairs whivh are always in motion, and are always moving in the same direction. When you have been out breathing in dust etc., and you cough, it is brought up by these little hairs,--each little particle of dust is tossed along from one hair to another, and a current of mucus is kept moving by these hairs until it comes up in the throat to be discharged from the mouth. These little individual cells have been found alive, twenty four hours after death, still working--that is, after the individual dies as an individual the cells are alive. So you see we are fearfully and wonderfully made.

No doubt if a person could look into the inner structure he would say, "Is it possible that I am constructed in that way? What keeps me alive?" If he were examining an individual in whose constitution disease was making sad inroads,--so that he was tottering upon the brink of the grave one would say to himself, "Why is it not I? What is it that keeps us alive?" It is a most wonderful thing, my friends, that it is possible for us to live. But life hangs by some of these little brittle threads which we have been examining here; if some little thing happens to go wrong in the human body the thread of life is snapped in an instant. Now it is only because the same God that made us keeps us alive every moment,--the same power that keeps the worlds going round the sun--that makes the grass grow by His rain in the summer time; that makes the trees grow and send out their leaves; that makes the flowers bloom--the same power that is constantly working throughout the universe is working in us, controlling the whole, keeping the heart beating, maintaining its wonderful rythm and the rythm of respiration, each little cell performing all its functions,--it is God that keeps us alive. If we only think of this, does it not seem clear that it is the duty of every man and woman to make the most of himself?

I had a most interesting little talk in our mission in Chicago. I had some carnations that I took in for the children, and I took one of these carnations for a text. The Sabbath school lesson for that day was, "How God Speaks to us;" that we learn about how God speaks to us through the Bible and through nature. It occured to me that that would be a good opportunity to show these

children how God speaks to us in His works, and how He is all the time talking to us individually. I had them all gather around me,--I had the poor little ragged urchins from the slums, who had never heard much about God and about good things--and I asked them this question--"Did any of you ever hear God speak?" "No," none of them had ever heard God speak; they could not understand that. So I stepped up to the organ and made the organ talk; it spoke with just one voice, so the children discovered that the organ had a voice. Then I made it speak with two voices, and then with three, so they could hear the organ talk. Then I brought out a flower and asked them if they had ever heard God speak through a flower. "No," they had never heard God speak in a flower. Then I held up the flower and said, "How did that flower grow"? "Out of the ground," said one of the boys." "What made it grow?" I asked. "It growed itself," was the answer. "Could you make a flower grow?" "Could anyone make it grow?" "No." "Then could it grow itself?" "No." "How did it grow?--it grew from a seed, didn't it?" "If I should put a seed upon the table, would it grow?" "No, you would have to put it in the ground." "Well, could it grow itself from a seed in the ground ?" "No." "Then what made it grow?" Not receiving any answer I said it was because the seed was put in the ground and after the seed was put in the ground God spoke to it and told it to grow and then it grew up and became a bud first, and then a blossom and then a beautiful flower. It grew because God told it to grow; it budded because God told it to bud; it bloomed because God told it to bloom,--it obeyed all of God commands and so it became a beautiful flow-

er. There was a little bud on a stem to which I called their attention, and asked them, "What is this little bud doing?" A little girl who had caught the idea said, "It is listening." "Yes," I said, "The flower bloomed because God spoke to it; it was a silent voice,--I could not hear it, the children could not hear it--but the ~~flower~~ bud heard it, and obeyed, and became a beautiful flower because it yielded perfect obedience.

I asked them another question, "Did any of you little children ever do anything wrong?" Most of them hung down their heads,--they did not any of them hold up their hands. Said I, "Did any of you ever go out upon the street corner and see some good nice large apples, oranges, etd, upon a fruit stand? "Yes." "Were any of you ever tempted to take an apple or an orange." A little boy at one end of the class held up his hand and a little girl held up her hand,--said the little boy, "I didn't take the apple." "Why not?" "Because a man was there." Then I said to the little girl, "Why didn't you take it?" The little girl blushed and said she didn't do it because she thought it was wrong. The little boy told the truth; he was so small that he hadn't learned to tell lies, I think,--he told the truth, any way at this time. Then I asked them if they had ever been hungry. "O yes", they had been hungry a good many times. "Where were you hungry?" "Down here," a little boy said pointing to his stomach. "What is that?" The little boy did not know. "That was your stomach asking for something to eat." "Then the stomach had a voice, " I said. "Yes," they all understood that. Then I asked, "When you were thirsty, where

did you feel thirsty?" The answer is, "In my throat." "Then that was your throat calling for water, wasn't it?" That was also clear to them. "So there are voices that you can feel as well as voices that you can hear." "Now this little girl thought it was wrong to take the apple,--what was it that made her feel so? It was God speaking to her and telling her that it was wrong to do it,--she felt it--that it was wrong to do it." Well, the children seemed to get the idea that God talks to us through conscience; that God is speaking to every one of us; He is speaking to us in this manner as well,as in the beautiful flower; He is speaking to us in many ways; He is speaking to us in the way He talks to nature, animate and inanimate, leading us to conform to the laws of our being. He says to us , when eating unwholesome food, "Don't eat that; it will spoil your stomach;" He says, "Don't drink that, it will spoil your liver." He says, "Don't do that,--that is a useless waste of energy;" He says, "Don't smoke that cigar, young man,--that will spoil your brain; that will spoil this beautiful work of art that I have created." God is saying these things to us all he while, and He is speaking to us in voices which means a great deal more than that. He says, "Don't think that thought,--it will spoil your face and spoil your character; don't look at that--by beholding we become changed--don't look at that!"

Why, my friends, if we can understand our bodies and the wonders wrought in our bones and muscles and in all these wonder-

ful structures of the body that are incorporated within it so intimately that even our muscles obey the slightest thoughts of our brains so that the attitudes of our bodies and the expressions of our faces are all the time reflecting the exact condition of our characters; every single fiber of brain and muscle has its impression,--all speak to us saying "Take care of this body,--take care of this wonderful masterpiece of God.

MEDICAL MISSIONARY COLLEGE OPENING,

Battle Creek, Oct. 1, 1895.

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Opening address by the President, J. H. Kellogg, M. D.

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The rational physicisn does not treat symptoms; he treats the patient. He is not interested especially in curing the disease, but he is interested in curing his patient,and, in order to do that, he must find out what made the patient sick,--what are the causes of his disease. He will find the proper means of removing the cause of the disease;but, in order to do that, he must understand the human body,so that he can trace,through the symptoms back to the real seat of the malady, and from that, and by inquiries of the patient,he must trace the cause of the sickness and remove that cause. By going back to the fountain-head and administering the proper remedies the malady will soon disappear ,--in other words, when the patient gets well,he is no longer sick; when the patient is well,the disease has disappeared.

We have not time to go ~~to~~ go into all the medical principles this morning, but I only mention this as an illustration of the reason why the rational physician must know more than the ordinary physician. So in this course of instruction you must know more than the student at Ann Arbor or other similar schools; for this purpose then you must have larger facilities and better facilities than other students. So, in every department of this school, you will be furnished with every facility. The Board have expended several thousand dollars, and will expend more, if necessary, to give you the best facilities for reaching this high standard. It is not expected that this shall be a cheap school in any sense, or that the student will get through in a cheap way, or that a standard lower than that of anyother school will be allowed here. It is expected that all the conditions are going to be favorable for hard work. You will also have hygienic diet and hygienic home conditions. It is expected that every student will adopt

correct personal habits in reference to hygene, baths and everything pertaining to healthful living, so that you will be able to accomplish more work than you otherwise would in the same length of time. And your course of study covers a length of time which is amply necessary in order to enable you to go over all the necessary subjects thoroughly.

I want to say a word further in reference to our school and the attitude which seems necessary that our students should take toward the school. This school is a pioneer school; it is the first school that has ever been organized --the first instance in which this kind of school has been organized; it is the first medical college which has the word "missionary" attached to it; it is the very first Christian medical ~~missionary~~ college ever organized; it is the very first college, I suppose, which has been organized or opened for students in which all the students and all the teachers are professed Christian men and Christian women. I don't think there has ever been such a thing seen before. Medical science, medical men and medical schools have, for many years,-- and I think I might say many centuries --been rather in antagonism to religion. It is generally known that the doctors are, for the most part, irreligious men. The spirit of irreligion prevails in our medical schools. It is a very common thing to hear profanity from professors of medical colleges, in conversation, and sometimes even in their lectures. Violent attacks upon religion and contempt of books upon religion are often known in these schools. It is not uncommon to hear more or less vulgarity among professors of medical schools, also among the students,-- and sometimes actual obscenity. I have seen in some of the rooms of phy-

sicians and surgeons things thoroughly demoralizing in their tendency. Now here is a medical school absolutely free from everything of that sort, a school in which there exists an atmosphere of purity, an atmosphere of conscientiousness, an atmosphere of religion which can be constantly maintained everywhere, in which every operating hour is begun with prayer, and in which every day's work is begun with prayer. I never heard of such a thing in a medical school before,--and I think no one else ever did. Now this medical school, as I have stated, is a pioneer in this way; it is an enterprise so unique in this respect that all engaged in it ought to be enthusiastic in its support.

One encouraging thing in reference to this pioneer work is, that it is the outgrowth of another pioneer work which has already achieved success. I look back to 29 years ago this Summer and I remember well when this Sanitarium across the road was just beginning. It was a little wooden building just east of the main building; it was a small cottage, but it looked like a large building to me then, It has been enlarged twice since that time. We all thought it was a grand enterprise. These trees were little grubs then; at least half of them have been cut off, they were so thick, but then there was only enough to make a good shade; the largest of them was no larger than my arm, and I sat down under them with the rest to take dinner, as there was not room in the building, and we thought it was a grand occasion,—that of the completion of the building. A Brother White spoke on that occasion of this auspicious day when our hopes are realized in the establishment of a Sanitarium." There are only a few who were present then who are living now beside myself. This was nearly thirty years ago and only a few of us have lived to see this in-

stitution grown up under the blessing of Providence to be an Institution that is no longer in a corner, of no reputation, but is known all over the world. A few years later --some 22 years ago last Spring, when I became acquainted with L, I was having a ride with Bro. White one day, and he made several remarks to me that I could hardly comprehend at that time. Among other things he said "Doctor, my wife has seen that the day will come, when, instead of this little wooden building that we have here there will be cottages all along up the road, and this territory here will all be covered with buildings, and this Institution will be known all over the world." Well, it required a great stretch of faith for me to believe that. We looked upon our people and institutions, at that time, as small, and we felt very humble and small and didn't see how this little place could ever have anything like a world-wide reputation. I only speak of this as an encouragement to you, so you will see how God has prospered this institution because it has stood for principles. It has been the only representative in all the earth of the true principles of reform. There are other institutions which have represented some of these principles, and there are companies of men who have represented some of these principles, but there is no other institution in all the world that has represented in their completeness the principles for which this institution has stood, and it has prospered, not because of the building that is connected with it, not because of the great skill we have here, or the great wisdom of this managing committee,—for the Lord uses very small means and very imperfect means to accomplish great ends,— but it is because of the truth and the soundness of the principles planted here in

this Institution.

Now this Institution that has organized here a short time ago, and which is beginning its work to-day, is the outgrowth of an institution and of principles which have already proven their vitality and soundness by the experience of nearly thirty years, so, if your hearts fail a little when you see such a small beginning of our medical college, you want to look across the road and see what the Lord has done from small means. This is not an untried thing, but it is a step in advance in a work which has been marching along for a quarter of a century and has been achieving success at every step; so you need not have any fears for the success of the enterprise, but instead of that we ought to have faith and enthusiasm and confidence in it. Some of you think it is a great thing to venture out in this untried school, to come here and enroll yourselves as students in a new medical school which is now opening up its first term, but I dare say that there never was a medical school in this country that opened its first session with 40 students.

I think they generally start out with ten or twelve students--and thankful for that. I have seen schools of this kind open up with two or three students. The first opening is generally very small indeed, but here is a school starting out with as many students as did the Johns Hopkins School,--it was found that they had less than 40 students in their first enrollment, but we have a school starting out in its first beginning with as many students and with as intelligent young men and women as attended at the opening of the Johns Hopkins Medical School. That school has been already opened 12 years and the entire enrollment is scarcely greater than the company I see before me today. So, so far as the

numbers are concerned, we have reason to feel encouraged.

We have here all that can be asked for learning. We have text books, teachers, laboratory apparatus and opportunities for observations of disease in our hospital here, in our dispensaries at Chicago in short you have facilities and advantages such as very few medical students have. As I remarked yesterday, there are probably not half a dozen schools in the United States who have any better facilities than you have here . Taking into consideration the plan of study in which students are to enter, the practical contact with the sick from day to day--not having to wait for a long time before you have anything to do by way of treating the sick--having all facilities about us, we have advantages which no other school affords,--we have an opportunity for becoming, by constant observation , more familiar with disease and more familiar with the right methods of treatment, and better prepared to deal with disease in a practical way than could be obtained in anyother school. I don't know of any school that begins to afford the opportunity for practical instruction which is afforded in this school, and it is so arranged by the managers that these opportunities of practical observation and practical experience shall at the same time be made a means of meeting your expenses so that you will not be giving your time gratuitously, but will have compensation for it. Those who find it necessary to pay their way in work will be earning their way, having 5 hours in all for work. Those who have money or means to pay their way will not, however, find it possible to excuse themselves from the practical experience which is absolutely essential . Those who wish to earn their way will be required to work three hours in ad-

dition to their experimental work, making five hours in all. Three hours will not pay for your board , but it will be allowed and credited and added to the two hours which you put into your experience, as an encouragement to those who are struggling along to get an education by their own efforts and wish to be, as far as possible, self sustaining and independent.

Now it seems to me that under these circumstances no one ought to feel that he is risking very much by entering this school. The greatest risk in this enterprise is on the part of the Board which has taken the responsibility of starting this school. The Board has taken the responsibility of spending the money which the Lord has placed in their hands to be expended in his cause,-- this Board have their reputation at stake and they are responsible for the way in which they spend their money, and they feel their responsibility greatly; they have placed themselves on record as having started a medical school , and now if this school fails, a stigma will be brought upon them,-- and what a calamity that would be! There is no student here that is more interested in his own success in life--I think there is no student that can be so much interested in this matter as is the Board in the success of this school. The Sanitarium is connected with this school in a certain way, also, so its reputation , which extends far and wide, is likely to be damaged unless the school is a success. Then here are the faculty of 17 physicians who have agreed to give their time to you-- and this is no small sacrifice on their part; they must give up a great many hours that they have had heretofore for self improvement; they must give it up for your benefit, and the opportunities which they really need from day to day for re-

creation and rest they must put in for especial work in preparation to help you. The teacher who appears before a class of medical students must study; he must work to prepare himself to instruct students thoroughly; he must work as hard as any of the students, for it is necessary that a teacher should know a great deal more than he asks students to know. Medical science is a large subject, and no professor in any medical school can get along without hard work and study. If you could go into the private room of any professor in any of our high schools you would find him at work, and working harder than any of the students.

Medicine is a science, and absolute accuracy is of the utmost importance, as this is a matter which deals with human life, the most sacred of all human possessions. There is nothing so valuable as human life. There are no other responsibilities on earth so great as those with which a medical man or a medical woman deals; so it is necessary that teachers should present the exact truth; that they should be accurate in all their teachings.

And these teachers who have undertaken to carry the burden of this school, in so doing, have made great personal sacrifice,--and it is for your good. Their reputations are at stake, because no young man or woman, and no physician who has any respect for himself would care to be connected with a cheap medical school or with a medical school that is not a success. If this school is not a success, every one of its physicians and teachers have a stigma and a blemish cast upon our reputations because we are connected with it, and, if this school does not succeed, we are ourselves charged as being blamable to a certain extent, and it will never be forgotten.

But you are interested,more than any one else, in this school. So I trust there is no young man or woman who feels that he is making a sacrifice in coming here. If he has that feeling; if he feels that he should be elsewhere, and can do better elsewhere, he should certainly go there; and if there is any such person here now, he should come to me to-day and inform me of the fact and I will find some way to help him go to some other school; I would do so, if I had to hire money for the purpose. I would rather do so, in such a case, because such a young man or woman would be a dead weight to be carried along , and we don't want any such dead weight. If there is any young man or woman here who does not feel that it is a high privilege to be a member of this school,--that it is not a mere make-shift,--if he does not feel that this is the best opportunity for accomplishing what he believes God wants him to accomplish--if there is any young man or woman here who does not have that feeling, he should certainly not be here, because the Medical Missionary Board has undertaken to give just that sort of opportunity to young men and women, not simply to give a medical education but to prepare students to do work for God and humanity and to become true medical missionaries. Now I mean just what I say about that,--if there is any young man or woman here who feels that he is making a sacrifice by being here, we don't want him here, and the Board don't want him here , and we feel that he is committing a sin and a wrong by being in the school and that he is acting a lie if he stays in the school.

I expect you will say that these are pretty hard words, but I mean just that thing,--those who are here should be those who believe that this is God's opportunity for them, and if you don't believe that, you should not be here. I would rather give $500 to help any such young man

or woman go away than to have them here with that sort of feeling. It would be an elephant upon our hands and we don't want that sort of elephant here; we want every young man and woman not to be a weight but to be full of enthusiasm for the school , to be true as steel to this school , and to believe that it is of God's planting, and that they are enjoying a high privilege in building it up and helping to sustain it, and if there are any here who are not willing to stand by the physicians and the Board who are making a venture and are stepping out on faith in God and in you to establish this school--if there are any young men and women who are not ready and anxious to do this they have no right to be here. This Medical Missionary Board is not going to persuade anybody or to coax anybody to enter this school. Those who enter it as medical missionaries must be full of the feeling that God has called them and that God is helping them on--if they don't have faith in God, that God is helping them, and will help them in this work, and that God is with them in it, and do not have that thorough confidence that God is in it and that God is here,— if they don't have that feeling then they ought not to be here. This is the sort of young men and women that the Board wishes in this school, and this is the only class that can be relied upon . If there is a student coming here rather against his will ,--feeling that he would like to be a medical missionary, but rather regretting that he has not the opportunities of others because of his attendance at this school--that idea will grow upon him until he finally looks back upon the school with contempt.

We have no great things to show; the only great things we have here are grand ideas and grand principles. We have no mon-

umental buildings to show, but we have grand principles; we have grand ideas,--and the best thing of all is the feeling that God is in it. ("Amen") When we look across the road and see what God has done and when we look out and see what God wants to have done, it seems to me we ought to feel that this is a grand work and that God is in it; it seems to me that every young man and woman ought to be full of enthusiasm, and full of faith and full of earnest desire to help forward this work, and to stand by it under all circumstances and to stand up for it.

This work is beginning, and many know almost nothing of the work. You may be surprised, but, in this community of about 2000 Sabbath keepers there are but few outside of this Institution who have any idea of this work. Many send their children to school, but they don't understand what ,--they have not the real spirit of reform and the missionary spirit that dominates our work so they don't understand it, and we hear a great deal about this "little medical school",--to illustrate, I will tell you a circumstance: A good brother who has been in the cause almost from its beginning, who has occupied a leading position in it for many years, who has been for some twenty years an elder in the Battle Creek Church--this good brother (I think I will not identify him any farther) this good brother said to me, one day as I met him on the street, "Doctor, I hear you have quite a number of surgical operations at the Sanitarium; I was rather surprised at that. Do you do a good deal of surgery there? I have heard you have several operations a week up there,--is that so?" He was quite surprised when I told him we had from 10 to 20 and even as high as 25 operations weekly and had had from 500 to 1000 operations a year for ten years or

more, He was perfectly astonished ; he hadn't the remotest idea that there was any such thing going on here. He had heard that once in a while there was an operation here and could scarcely believe my statement. Now if this brother who had had such opportunities of knowing about our work was in such darkness, you can see how it must be with the rest. There is not really much interest in our work in this community, so our Institution is much in the same situation as our Lord when he said"A prophet is without honor among his own kindred." So it is with the Sanitarium. A lady who came a long distance once said to me, "Doctor, I believe the Sanitarium is better known at a distance than it is here. I was talking with some one here about your work and they didn't know anything about it,--they didn't know so much as I do, and I live 500 miles away." Now why is this? I suppose the reason is that we don't blow our own horn. You never saw any account in the Battle Creek papers about a surgical operation in the Sanitarium. If a man down town breaks his leg and the leg is set, you will find a half column account of it , but there has never been an account of a surgical operation in our local papers because I don't allow any such thing to get into the paper; I think it is disreputable for a physician to allow such things to get into the papers; it is a thing that ought not to be done and I don't encourage it; I don't think it is justice to the patients that their cases should be written about, so we suppress everything of that sort. You have many of you been reading Good Health for many years, I suppose, and you have not read such a thing as a surgical operation in it. I have been connected with it for twenty years

and I have never allowed an account of a surgical operation done in the Sanitarium to get into the columns of ~~the~~ Good Health. There is a little statement ~~sometimes~~ made in the Medical Missionary about our charity beds for the encouragement of people in reference to endowed beds, so that it can be seen that there is something done in this direction, and how much good is being accomplished, but I have requested Sister Whitney, in writing up these accounts, not to mention my name, or the patient's name, and to mention as little as can be said upon the subject, and that is the way our work has been carried on . I have felt fearful that people will think this is <u>our</u> work , but we want every one to understand that this is God's work--that it is not man's work, nor work of any set of men. So I ask you to have confidence in this work,--not because you see here a learned faculty--because you don't, not because you see here a very grand and ambitious enterprise from a worldly standpoint because it isn't, but I ask you to have confidence in it because God is in it. That is the reason I ask you to put your whole faith and your whole confidence in it and not be wavering about it, nor to have the least doubt about its success. If you have doubts, they will increase; now put them away if you have them.

One way to cultivate faith is to pray for your work; pray for your teachers; pray that God will prosper the work; pray for yourselves; engage in your studies as you would engage in the study of the Bible. When you consider the human body, consider it with the thought that it is God's temple; that it is God's masterpiece; that every nerve and fiber is of divine origin, and that ~~in every~~

God dwells in every human body, and that there is a God in every heart beat; that xx xs in every breath, in every pulsation , in every thought and in every thrill we have demonstration of the existence of God,-- that God is at work in every human being and consequently that this work is sacred, Everything connected with this work--the study of it--histology, bacteriology, chemistry, and all the marvelous phenomena with which you are brought into contact--it is God at work. We must see God in nature;in all these chemical reactions, in all these living functions, we must see God. If we do this we can engage in our work in faith that God will help us and impress these things upon our minds so that they will be of a lasting character; so that they will be of use to us and we can make a practical use of them by and by. This is a school in which prayer can accompany every study; in which you can rightfully ask God to help you in your studies, and in your observations. You can, to quicken your enthusiasm, to help your memories, to aid your understanings, and to assist you xhen yxx xxgaxx in all you undertake. It is a blessed privilege to be engaged in such a work as this . I think I have not said too much with reference to having enthusiasm in this work and of standing by the school.

I have heard men remark in reference to this enterprise , "Oh, this is a cheap thing; this is a small beginning; this school wont amount to anything." And I suppose some of you have had persons come to you and say "You had better go to Ann Arbor ~~and~~ or Chicago; you don't know what this little cheap school is going to be or what it is going to do; you had better go somewhere else." How many of you have had such an idea presented to you? Hands up! There is scarcely a hand that is not raised. Now what I have said to you at this time, I have never said before, because I wanted to see, and the faculty wanted to see how many of you could stand fire . Persons have come to me, and this one and that one has talked about the school , and I have kept perfectly quiet, and haven't said one word in reference to the matter, because I wanted to see how many had real faith,--how many had the right sort of metal; I wanted to know how many of you think God has sent you here. If you feel that the Lord is helping you we need not have any fears of your being switched off the track, but if the Lord has not sent you We don't want you here.

We don't want a big school. We are more afraid of a big school than of anything else. Dr.Olsen has been saying to me, "What in the world are we going to do with this school,--there will be so many of them?" Well, ofcourse, we must do something with them, but we are not anxious about that. If half a dozen of you should leave, we would be sorry for you, but not for the school. We should not mourn for it at all; we should mourn for you, but we would not mourn in behalf of the school, because we have already three times as many students as we expected to have, nevertheless we see calls still coming in, and we have been making pro-

vision so there is room enough for all, so that all can have the proper opportunities and advantages here.

As I have said, we have been waiting to see how you would stand this fire of persecution. A medical missionary has got to be prepared to stand up under a good deal of opposition, and if you can't stand when this little opposition comes at the beginning, you wont stand it by and by, and you have got to make up your mind to stand it by and by, because it will come. I want to tell you that this has been true in regard to myself. My path has been a stormy one for a long time, and it has gone so far that I really begin to love a fight; fighting has come to be a sort of second naturefor me and I have for a long time been in the attitude of one expecting an attack every minute. I don't think I have had any more trials that I have needed,-but I wont harrow your minds by telling you what I have endured. I am sure, however, that it was all necessary for me, and perhaps I have not had as many trils as I have needed, and I expect I will have to have many more in order to make me what I should be, but I have been benefited by the trials which I have had, and I know the Lord will let me have them for my good and the good of the work. So I want to tell you that it is not easy sailing; the medical missionary has got to stand opposition . I have had, as I said, a hard fight in all this work. You have no conception of the difficulties and the perplexities and trials that we have had to maintain these principles in this Institution. Some of you who have lived in Battle Creek for a number of years will have a better appreciation of what I am saying than xxx of those others . Those of you who have recently come in can have no idea that we have suffered such an opposition as we have in reference these principles--of the

fight that we have had to keep our little Institution separate--we have had to keep ourselves to ourselves. I have wished many time that we were thousands of miles away from every church and institution so as to be free from these opposing influences . Still this has been a good school to us; we have had to keep wide awake and in arms every minute. So it must be with you right from the start to the finish; you will find that you will have your battles to fight and your perplexities to grapple with as well as we, but that is a part of your necessary discipline. When a medical missionary goes out into the field and does good work,--useful and effective work--the devil understands it and he fights the medical missionary more than anyother man because he knows he can do so much more execution by his opposition to these,than by opposing others who go out into the field to labor simply as missionaries and hence do not have the perplexities of the doctor who finds himself surrounded with subjects for medical missionary work, every one of whom the devil is calling,--and he is trying to call into his service every one whom you are trying to save, and if you have a hundred such individuals to look after the devil will be a hundred times more active than if you had but one. So the harder battle you have to fight the stronger you must be in order to be able to meet the enemy. It is a matter of the utmost consequence, you see that students should go through this experience and have a period of trial; that they should go through the ordeal so it can be determined what sort of material they are made of--what sort of character they have and how well they are going to stand fire in the thickest of the fight.

Now a few words relating to our work: First, in reference to our course of study. We have prepared some schedules of laboratory instruction. The program is on the board here and we will have it printed. We have a little calendar which has been prepared for your use and this will be placed in your hands . We also have some extra copies of the program of last evenings exercises and you can have what you want to send to your friends at home. You will notice that the study hours are, in the forenoon from 7 to 10. .. Laboratory work afternoons at 2:30 and closing at 6:30. So you have seven hours of class work daily. This continues for five days in a week only, so Sunday is free. There is no oblicatory class work on Sunday--do didatic work or lessons on Sunday , but the laboratory will be open Sunday afternoons. Wednesday afternoon is operating day, and it will be necessary, doubtless for some of you to be called upon to assist in surgical work. Those that are present Wednesday afternoon assisting in the operations will be allowed to come into the laboratory Sunday afternoons .. Regular work from 10 to 1:30--3-1/2 hours. Students who are putting in their time for their board will work from 10 o'clock A.M. until half past one, including the noon meeting. If you attend the department meeting for half an hour this will count as work, and you will fall short one half a day. If they become so proficient that they can be employed in the bathroom they can make up one hour more during the week, and an opportunity will be given for doing that Wednesday afternoon or Sunday afternoon; on Wednesday or Sunday you will be given an opportunity for putting in five hours, which will make up for loss on other days--five or six hours, as the case may be. Ofcourse it is under-

stood that medical work goes on on the Sabbath the same as on other days, to a certain extent; patients must be cared for; nurses have to look after patients; students must look after the Sabbath work the same as the nurses, so this wont be an all day Sabbath, because you have certain hours to work the same as other days. This is necessary in order to share your burdens with the doctors and nurses.

A word or two in reference to emergencies: This is medical work, and as medical students you must make up your mind to share your lot with the physicians. A medical student who has not been allowed to carry any of the burden of the physicians, when he gets through the course is not likely to be worth much; he is likely to be rather a feeble sort of person; he wants an easy place somewhere--a "soft snap" as one student said--he was very glad to have a soft snap. We don't want any such students as that. So you must share your lot with the doctors. Sometimes you will be called up in the middle of the night, and you must get used to that. That is one of the experiences the doctor has to endure. No doctor lays down his head with the expectation of sleeping during the whole of the night and without the consciousness that he is liable to be called up in the night,--and perhaps stay up the rest of the night--and I hope that is just what will happen to you so you will see what it is to be a doctor. Sometimes you wont get time for your breakfast, but that also is what doctors must get used to. People don't have any mercy upon doctors. The doctor who thinks more of his breakfast than he does of his patient will soon lose his standing, even among the heathen. A person who is not willing to lose his sleep or his breakfast for the sake of his

patient is not the right kind of a doctor . A doctor must have such a desire to relieve suffering that he will run at once-- at the first intimation of an opportunity to do good somewhere and be ever ready to give relief. He must be ready to answer any call at any time, and not to linger to consider his own pleasure.

I should say that the exercises in the morning will be opened with prayer, as this morning, --the first recitation will be opened with prayer.

I have now only one or two brief points, I think, that must be considered. Let me say a word or two in reference to your reports. .. You must not forget that we are all Christian men and women. We have all made a high profession of religion; we have all made an entire consecration to God. This is not a company of beginners in christian experience, but all who are here are supposed to be tried and proven Christians;--that you have been tried and xxxxxx have proven to the satisfaction of those who know you that you are consistent Christians--and we must maintain that character. It will not do to let ourselves down below that standard at any time. The use of levity and foolishness, or anything on a lower level must be absolutely discountenanced in this school. Now it is not necessary to have a rule against each of those things. It is not supposed , for instance, that Christians need to have a rule against levity. Ofcourse any one having common sense Christianity will at once condemn levity, and we believe the spirit of this school will be such that it will not be necessary to make minute rules as to the conduct of the school . Ofcourse we must have a few regulations, in reference to hours, &c. and so the Board and Faculty have appointed a committee in re-

ference to regulations, arrangements, order, &c., and this committee will have a meeting today at one o'clock and I have been authorized by the Faculty to appoint a committee of students to meet with this committee, because it is a matter in which you also ought to be represented. The Faculty does not wish to assume the attitude of laying down rules to you as they would to boys and girls who don't know what is right and proper, but they desire that this school shall be self-governing. Almost 30 years ago (28 years ago this next winter) I was teaching school in the back woods of Michigan, and I tried the principle of self government in my school. I didn't make many rules, but I endeavored to put my pupils upon their honor, and tried to create such an enthusiasm in the great majority of the pupils in favor of good conduct that they would frown down bad conduct, and this was done; to such a degree that I didn't have much to do. If some of the boys behaved badly some one of the other boys would bring him to terms,--and it was quite necessary for me to adopt that principle, as I was a small boy myself and there was a number of big boys in the school. (Laughter) I was informed that they were going to put the teacher out, as he was a small boy, and I thought I would outwit them and not be put out. I had a large school and everything was taught from A, B, C, to higher algebra, and we had a good time. Now I hope there will be no occasion for discipline in this school,— There ought not to be. The young men or women selected for this school are supposed to be of such high character and reputation that they have not got to be ruled like little boys and girls. So as I said, we don't expect to formulate a lot of rules, but still we must have some regulations as to order, hours of study,

&c., and I am authorized xx by the Faculty to appoint that Committe and I will appoint as such Committee, Bro. Pickey, Mrs. Loughborough and Bro. John Morse, and I trust this committee will be able to meet with the Faculty Committee at one o'clock today at their room in the Hospital.

Now one word more and then I think I have finished what I have to say this morning--there are two words that I want to say. (Laughter) One word in reference to your aim in scholarship. I hope everyone has set his mark high; that he will attain the highest possible point in scholarship . I was pained, upon looking over Bro. Nova's report on bacteriological examination. Of course this was a class held before the regular opening of the school , and it was consequently considered by some as an irregular class, but it was partly intended as a test class or a thermometer, so to speak to determine the character and the ability to attain a high standard on the part of students in scholarship , and I was distressed at finding that of all those who had had a good opportunity to succeed there was one student who did not pass; his grade was so low as 31; several were below 50--three were below 50 per cent. Now that is not very creditable; I thought every single one would come up to the mark. One or two students, I understand, fell asleep even in the class. Now if there are any students here who cannot keep awake in the class they had better drop out because this is going to be a wide-awake school--a wide-awake class--and if there are any here who can't keep awake we shall not make any effort to keep them awake,--they will be dropped out, because the xxxxxx medical missionary class cannot be engaged in keeping awake any poke that might fall asleep. So we want it understood that a high standard is going to be demanded

of students, and those who don't come up to it are going to be dropped out. Nobody is going to be kept here because he is real good. There is a place for good people of this class, but it is not in the medical missionary ranks. Now we want people not only to be good but to be sharp, keen witted, and wideawake, and nobody else can expect to go through this course; and others will be dropped out. If there is a student who has not the courage and energy to cope with the difficulties before a true medical missionary, he is going to be dropped out, and can take up some-other lines of work which he may follow. But this course means hard work, I expect pretty soon you will think it is hard work, but it is going to be harder all the time, and you should not come to the conclusion that your mental muscles will become harder by exercise so that you wont feel the work, and your work, if you succeed will be greater hereafter, for heavierand heavier burdens will be laid upon you. So if you find that your work is getting easy, you may consider that you are not doing it thoroughly,--that you are merely sliding through it and are not really improving your opportunities and are not grasping the subject, for if you grasp the subject brought before you, you will find it hard work all the time and you will have to exert yourselves to the utmost to get what you can and to keep what you get.

Now a word in reference to criticism: I don't think there is anything more destructive to spirituality than the spirit of criticism; it is absolutely opposed to the spirit of charity. The soul of medical missionary work is charity,--it is to love one's neighbor as himself. In the ordinary medical college the student does not love his neighbor as himself, as a rule.

There is a spirit of competition cultivated in all our colleges. Prizes are offered; there is a prize for the one who passes the best examination ; his name is read before the rest and he is extolled above the rest, and there is a spirit of strife and emulation among the students,-- there is a spirit of get-ahead-of-some-one-else. If you can get ahead of some one else you are glad of it; if you can be before everyone else you are glad of it. Now it is perfectly right to reach as high as we can, but we should not be trying to get ahead of someone else. We should be working to get the largest and the best preparation; we should be striving not to get ahead of some one else, but to be the most useful; we should study for the sake of what we can gain, for the sake of thorough preparation, for the sake of the result to ourselves and those for whom we shall have an opportunity to labor by and by. Now the spirit of criticism, as I said, is entirely destructive of spirituality. The man who criticises another, --the more he criticises him the worse he looks--and when we do that to a man we draw away from him , and the further we get away from him the bigger his faults look . I have had that experience in criticising people and found that the further I got away from a man the bigger his faults looked, no matter how near I was to him physically. You may be very near to a person physically, but mentally you may be miles away from him. But we condone the faults of those we love,--we are blind to their faults. Now if we have the spirit of ~~perfect~~ brotherly love, the spirit of charity in our hearts, we wont be so wide awake to the faults of our associates, and we wont criticise them. Let us make a rule that if we see a fault in others we will say nothing about it except to that one person, un-

less it becomes necessary to do so,--if it affects the whole school. If we see a fault in our brother, let us, as the Bible says go to him and labor with him, and after laboring with him, if we cannot bring him back, then report the fault to the proper authorities, but it should not be reported to another person; it should be reported to some member of the Faculty, but not to another student. Now let us adopt that principle as the right thing to do,--that we will not criticise one another. If a student is dull in his studies let us not talk about it; let us put away this habit that is dominant in all schools--of talking about students; of remarking how dull this one is, or how bad work another does in his laboratory work. That kind of thing don't belong in this school. This is the kind of school where we should love our neighbor as ourselves,--where we are supposed to love others as well--or perhaps better than ourselves--where we will cover their faults and help them if they need it, instead of telling of them. That is the spirit of Christ and of the true missionary. Let us be missionaries to one another; let us not talk about one anothers peculiarities,--we all have peculiarities. I was very much amused sometime ago; I had just been listening to some singing, and during the entertainment a young lady said to me, while speaking about the singing, "It would have been very good, if it hadn't been that such a one flatted so on the high notes." When the occasion was over (it was not a public occasion) another person remarked to me that the singing would have been very nice if such a young lady hadn't flatted so much on the high notes." Now it happened that the young lady who was criticised was the one who had criticised the other, and I thought to myself, "How blind we are to the faults of others." Now the

fact was , they both sang well; it was simply a habit of xx being hypercritical. I mention this as simply an illustration; I don't want to identify anybody now, because I don't want to be open to the same charge against which I am warning you, so I will say nothing more about it,--I only mention this as an illustration that occurred to me just this minute. We often criticise others for the same fault that is most dominant in ourselves. We sometimes say for example, isn't that person real proud?" Sometimes this is because we are envious of that other person because we think he is showing up better than we xxx do . But we generally show off our weaknesses to the best advantage when we begin to criticise other people. I am sure we have all met illustrations of that principle. Now there is a chance to criticise the Faculty; there is a chance to criticise the school; there is an opportunity for criticising the Sanitarium and the managers, to criticise your rooms, and to criticise your fare at the table, and to criticise the general order of things. You will find plenty of opportunity for criticism; you will find faults that you can complain about, and with good reason sometimes. Sometimes you will feel disposed to criticise because there are different things presented from what you are accustomed to find. New things will be criticised because they are new. And it is difficult for a person to sit in judgment here, because he can hardly tell whether the occasions of his criticisms are really wrong or because they are simply different from what he is accustomed to meet with,--and yet they may be better. Let us lay it down as a rule that we will have no criticisms at all, as criticisms are subversive to the interests of the school and the students. That is one thing that the Faculty

and the Board will feel it their duty to surpress. When a person becomes conspicuous as a critic here they will be looked after, because , as we have seen, it is not proper for a Christian student to have that spirit and that spirit is destructive to the interests of the school.

Now let us all take hold and cultivate the true missionary spirit,--the spirit of brotherly love, the spirit of kindness, the spirit of charity; let us ask God to give us the spirit of fidelity--of gemuine fidelity; let us put that into all our work. Let us be faithful to one another and faithful to God, and then we will go on with our work with the assurance that it will succeed, for I am sure that God is with us and in this work. Let us be proud that we were in this work at its beginning, let us be faithful to it and by and by we will see the work grow and develop and we shall feel proud that we had a share in it. Sometime ago, when we were putting on one of our additions to the Sanitarium , a leading lawyer of the city arose in our meeting and said "I wish to arise to congratulate Dr.Kellogg on his great achievements here. I certainly feel that Dr.Kellogg may well be congratulated in this great work that he is building up." You may imagine how small and cheap and embarrassed I felt, but I arose as soon as I could get an opportunity and said, "My friends, the only thing that I am proud of is that I have got aboard of a grand idea a number of years ago and that the enterprise carried on in accordance with that idea has succeeded ." So I thank the Lord that I got aboard of a grand idea and enlisted in an enterprise that was bound to be successful. Now after some years have passed you may look back upon this work and be thankful that God gave you an opportunity

to be here at the beginning of this enterprise. This, as I said is the day of small things, but it is not always to be small things.. It depends upon you whether it is to be small things or not. If you do your duty here, and if, after your school days are done, you go out into the world and do your duty well, then the success of this school will be established; it is the students and the graduates of the school that give it a reputation ; everybody knows that. The reputation of the school will be small until after some of you have completed your course and gone out into the world and done good work, standing up beside other medical men and women and have shown what this school has done; the school cannot have a reputation until then; it is only when its work is shown to be good work that the reputation of the school is established by showing what it does, and if you do yourwork well the school will be a success. So your standing will be just what you make it and cannot be made by the teachers and the school; it will be made by yourself.

One thing more that you have to congratulate yourselves upon, and that is the fact that you are working under a medical missionary Board . I have many times felt sorry for medical missionaries out in the world under Boards who do not appreciate their work. You heard last night that Dr.Kerr after 40 years faithful labor was compelled to support a hospital all alone in China,--after working 40 years under the Presbyterian Foreign Missionary Board, and supporting a hospital entirely on a salary of only a thousand dollars, treating over a million of people during that time and having more than 50,000 hospital patients. ~~Now was not so-~~ And it has not cost the Presbyterian Board only a thousand

dollars a year. And now even that is withdrawn, and he is supporting himself. He had put in every dollar he had in the world, and he is now a man 70 years of age; he has put all the money that he has ever been able to save into a little piece of land on which to build an extension to the hospital, but the Presbyterian Board would not raise the money to build the hospital,--and they would not grant him the privilege of raising the money by subscription to erect the building, so he has been finally compelled to take everything on his own shoulders, with all his life earnings, and raise the building, and there he is supporting this work, but the Lord will stand by him; the Lord is worth a great deal more to him than the Presbyterian Board. Now that is simply because the Board could not appreciate his work. Now the Medical Missionary Board is thoroughly in sympathy with you and with your work and by and by you will have the opportunity of going out under such a Board with the privilege of knowing that your work is appreciated and will be supported in a most thoroughgoing way.

And I hope none of you are going to backslide in this school. I recently had a letter from a Baptist missionary who said, "Doctor, I have a daughter who wants to become a medical missionary." (This is Mr. Allen who has spent his life in India, and now in his old age he is on an island off the coast of British America beyond Vancouver, living in the woods all alone; he invested all he had saved during his life time in that piece of land; I heard of him in India and wrote him a letter and he wrote me a letter in reply the other day and told me where he was. He is broken down in health, living up there in the woods all by himself and he said he was very lonesome), --"I have a daughter that I have educated for

missionary work, and she has dedicated her life to missionary work, and I want to send her to India, and I don't know what to do. I have a son and I sent him to London and put him through a medical education and gave him a missionary education and expended thousands of dollars for him, but while in London he has lost all interest in missionary work and refuses to go to India. He is going into public work at home, and I don't want to lose my daughter in this way. I want to know if you wont take her into the school at Battle Creek so that she may be educated, not as a physician, but as a missionary." I was glad to have the consent of the Missionary Board to notify Bro.Allen that his daughter would be received,- and I expect her arrival within a few days--the last letter said they were going to sail within a day or two. I mention this circumstance to show you how a medical missionary appreciates this Board, and I hope that this Board will be so regarded and appreciated here that none of you will fall out by the way and backslide and lose your missionary interest ~~very~~ right here soon in our missionary college,--it is quite possible to do that right here--and you will do it unless you keep fast hold upon God. This school is not to be made a sectarian school. Our work is upon the broad basis of the Gospel and of science, and we find God in both; it is not to be carried on in a spirit of sectarianism in any way

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The regular studies will begin tomorrow. .....

There is room for you to engage in medical work in the practical department and you will have opportunity to improve in the different departments. You are paid for your work,--your work is not done simply for practice, but for pay, in part, so that

your work must be helpful. you have four years of work here, so you have a practical opportunity to get experience in every department. If any of you find yourselves kept for an indefinite period of time--if you find you get "stranded" or on a shoal in your passage through this Institution, just let me know about it and I will see what is the matter; it may be that you will have proved so efficient somewhere that you are indispensible and thus have been kept back. If any of you find yourselves in such a situation and find you are not getting along so fast as you ought to I will make some especial arrangements to help you along,--but don't be too anxious to move along ~~rapidly~~ into another department the first year; you will find enough to keep you thoroughly engaged. Your business is not simply to learn how a thing is done but to acquire skill in doing it. It takes but a short time to move the keys up and down the piano, and you might think it would be easy to make harmony, but you sit down and try it and you will find it is a different thing from playing the scale to combine the notes so as to make harmony. This requires every muscle-cell,—and the brain- cells even must be developed and disciplined, and it takes a long time to acquire sufficient skill in your work. That is the advantage of your education; it is to educate your brains and muscles, so that you know not only how to do a thing, but to do it skillfully. Massage for instance, would seem to require only the rubbing of the body, but it takes a course of four or five years of constant practice to become really experienced and expert in massage. So you wont have an opportunity to get any more than you need, in any department.

Work hours. .....

THE

American Medical Missionary College.

AFTER mature deliberation the S. D. A. Medical Missionary Board has decided to organize and conduct a school for the education of missionary physicians. This institution has been already incorporated under the name of the American Medical Missionary College. So far as we know this is the first missionary medical college actually organized in this country, and we are not sure that in any other country there is a medical school exclusively devoted to the education of missionary physicians.

The reasons which have led to the establishment of this school are chiefly as follows:—

1. The importance of giving attention, in the education of the missionary physician, to missionary ideas and methods, as well as to purely medical and scientific subjects. The exclusive attention given to medicine and science in the ordinary medical college has a decided tendency to divert the attention of the student from the real object of his education, so that by the time his medical course is completed, it often happens that the intended missionary has lost his zeal for either foreign or home missionary work, and sees in the career of the ordinary practicing physician a more attractive life work, and a field of missionary opportunity large enough to meet the demands of his diminished enthusiasm. This can scarcely be otherwise. "By beholding we become changed." Mr. Darwin was frank enough to confess that his long study of science had almost wholly destroyed his taste for religion and paralyzed his spiritual activity. Science without religion, knowledge without the application of knowledge to the helping and saving of men, narrows the moral faculties, and blights those sentiments

which lead to humanitarian effort. We do not mean by this that a course in theology or in evangelical methods can be in any proper sense a substitute for the instruction received in a medical school; but what is needed for the missionary physician is the science and training of the best medical schools guided and permeated by religious sentiment and missionary enthusiasm. The Students' Volunteer Movement has accomplished much in supplying to our medical schools and universities a much-needed stimulus in the direction of missionary effort, but the good thus far accomplished is but a tithe of what needs to be done in this same line, and is merely a suggestion of what may be done in a properly organized medical college.

2. The long period of inactivity, or at least practical inactivity, required by attendance at a first-grade medical school involving four years of study for a period of eight or nine months each year, is highly unfavorable to the development of a true missionary spirit in those who, having genuine missionary impulses at the outset, need the fostering influences of missionary activity and of a missionary atmosphere to develop to a high degree a really genuine missionary character. Missionary work cannot be supported by missionary sentiment alone; there must be a practical missionary spirit; there must be a zeal and an ardor which nothing can diminish, which nothing can thwart, an enthusiasm which the most adverse circumstances cannot cool, which will surmount every obstacle and overcome every difficulty. The missionary who has to be spurred up to his work continually, stirred by appeals and aroused by exhortations, is not the sort of person who can be trusted with an important mission for God and humanity. The missionary must have oil enough in his lamp to keep it perpetually burning. He must be prepared to lend to others rather than be obliged to borrow from his neighbors.

The medical college is a splendid place for backsliding religiously, and it is a lamentable fact that a large proportion of those who enter a course of medical study with the expectation of devoting their lives to missionary and philanthropic work, before the course is completed, become so filled with worldly ambitions that they are ready enough to find circumstances wherewith to excuse themselves from entering upon the

work. The plans proposed for the Medical Missionary College are such as will give the student an opportunity for constant missionary activity during his entire course of study. From the very outset of the course, practical medical missionary work, in which the student will engage each day, will be made an important feature of the course of training.

3. Still another reason, and one well worthy of consideration, which has led to the undertaking of this enterprise, is the necessity for providing financial a-sistance in the cases of a large number of those who undertake medical study in preparation for missionary work. A large proportion of the most promising candidates for this work are persons who have already exhausted their resources in securing educational advantages and who have not the means wherewith to bear the large expense necessarily connected with medical study even under the most favorable circumstances. The Medical Missionary Board has undertaken to make loans to such, and experience has shown that the amount required for each student is from $500 to $1000. Already more than $20,000 have been thus invested by the Medical Missionary Board, and some years must elapse before any considerable amount of this will return; but in the meantime, the increased number of students entering upon this line of work, unless some change of plan is adopted, will necessarily increase the investment to double, perhaps triple, the amount already invested. It is thus evident that a limit, beyond which further assistance cannot be given, must soon be reached. By the establishment of the Medical Missionary College, the Board provides an opportunity for support during the course of instruction, not by means of ordinary manual labor or domestic work, but by means of practical medical work,— work in which the student will be learning lessons of fully as great importance to him as any which can be learned in the lecture room or the laboratory.

The great lack of practical work in connection with medical teaching is recognized as a conspicuous fault even in the very best medical schools. The ordinary medical school, and the ordinary hospital are so organized that it is quite impossible for the students to receive more than a very small amount of practical experience. In the majority of cases, the student has but little more practical teaching than that afforded

by attendance upon clinics, in which the professor and a few assistants do all the work, the student looking on at a distance, greater or less, and picking up such information as he can. In some of the more perfectly organized schools, students are given a limited opportunity for bedside experience in the latter part of the senior year. But the inadequacy of this as a preparation for actual, independent, practical work is too patent to require emphasis.

The great advantages afforded by the Battle Creek Sanitarium, its Hospital, and the several lines of missionary work already established in Chicago, afford an opportunity for practical experience for a hundred or more young men and women. The number now employed in practical medical work in connection with this institution is nearly 250; an opportunity is thus afforded for the medical student not only to look on while something is being done for a sick man or woman, but to actually do the work himself, and by daily contact with disease in its varied forms, to become thoroughly familiar with its aspects, and with rational modes of treatment, so that when his course is completed, he will not be obliged to spend two or three years in becoming acquainted with practical medical work, but will be prepared to enter at once some field of missionary activity, and in doing so enjoy the added advantage of not being loaded with a debt of from $500 to $1000, to weigh upon his mind and heart for several years to come. The amount of money which will thus be saved in college fees and living expenses will amount to not less than $10,000 a year. At least a large proportion of this sum will be saved, since the necessary running expenses of the Missionary College will be, in addition to those now necessarily connected with the work, exceedingly small.

The College is incorporated in Chicago, under the laws of the State of Illinois. The course of study will be as thorough as that of the best medical schools in the United States. The instruction will be given partly in Chicago and partly in Battle Creek. Arrangements are being made for the use of a portion of the College Building at Battle Creek for laboratory and class rooms. The lecture rooms at the Sanitarium will also be utilized.

The course of study will extend through four years. Preparatory courses of one and two years will be provided for those who require preliminary instruction in languages and the sciences. There will also be a practical course of two years, the instruction in which will cover the ground now covered by the Special Course of two years and the Nurses' Course of three years, now conducted at the Sanitarium. The course of instruction will cover ten or eleven months each year,—probably from 180 to 190 weeks in all, or nearly double the length of time actually required in most medical colleges, as the school will be in session all the time for the four years, with the exception of three or four weeks' vacation each year.

The instruction will be largely text-book study, practical drills, clinical and other practical work with the sick, so that from the very beginning, the student will be made familiar with disease in all its phases and with rational methods of treatment. It is believed that this course of instruction will be made a more efficient and thoroughgoing preparation for medical missionary work than any course of training or instruction which has ever been undertaken heretofore. The unequaled opportunities for practical instruction afforded by the thousands of patients who annually visit the Sanitarium in Battle Creek, the large number and great variety of important surgical operations performed at the weekly clinics at the Sanitarium Hospital, the immense experience afforded by the free dispensaries in Chicago, and the opportunity for obtaining a knowledge of rational means of treatment by actual work and observation in connection with the Sanitariums at Battle Creek and Chicago, which are universally acknowledged to be the most elaborately and thoroughly equipped medical institutions in the world, will give students such an opportunity for medical missionary work as has never before been offered.

It is not the purpose of this school to give students a cheap medical education, but to make the education more thorough and more practical than can be done in a medical school where the student spends the most of his time listening, with very little time in actual contact with the sick.

Young men and women of superior ability, and who give evidence of a sound Christian experience and thorough conse-

cration to missionary work, will receive board and instruction free, but will be expected to give such time as may be required of them to practical work in connection with the care of the sick in the Hospital and Sanitarium, in visiting nurses' work, in work in connection with the dispensaries, free bath-houses, and the gospel work in Chicago. All students will be received on probation. Those who are found, on trial, to be incompetent for the work, or who lack consecration or a true missionary spirit, and who do not make a satisfactory change for the better after being duly admonished and instructed, will be dropped out of the class. A regular tuition will be charged those who do not desire to do the usual amount of practical work.

It is now expected that the college will open not later than October 1, and possibly sooner if arrangements can be perfected. The qualifications for admittance to the regular course are as follows: —

1. Each candidate for admission must be nineteen years of age, or older.

2. The candidate must possess a good knowledge of the English language, including rhetoric and English literature; of mathematics, including arithmetic, algebra, and plane geometry, physics, botany, zoology, elementary physiology, general history, United States history, and an equivalent of one year's study of Latin. Diplomas, or certificates, from creditable schools, in which the above studies have been completed, will be accepted. In other cases students will be required to pass an examination. The student will also be required to pass an examination in Bible history and Christian doctrines.

3. Assurance of good health must be given, and recommendations satisfactory to the Board must be furnished.

Ordinary medical students will not be admitted to this school,—only those who are pledged to devote their lives to medical missionary work.

On graduation from this school, students will be furnished with a diploma and such credentials as will entitle them to practice in any place in the world to which they would be entitled to practice by a diploma received from any other medical school in this country.

In connection with the course of instruction in Chicago, ample opportunities will be given for the study of anatomy,

and also to profit by the extensive clinical advantages of the large hospitals of that city, and by the dispensaries maintained in connection with the Medical Mission in Chicago, under the supervision of the Medical Missionary Board.

This school is organized for the special purpose of training physicians to work under the S. D. A. Medical Missionary and Benevolent Association, in home and foreign fields. Properly qualified persons who have been accepted by other properly constituted Missionary Boards, will be received on payment of the regular fees. No person will be received who has not been accepted by some properly constituted Missionary Board, as a suitable candidate for Missionary work.

Expenses.— The regular fees, including the laboratory fees, will be $200 a year. Students will be required to do two hours' practical work daily. Students studying under the S. D. A. Medical Missionary Board will be given tuition free, and will be furnished work to pay for their board. This will require three hours' additional labor daily, or five hours in all. Only very capable persons, those who have had a good preliminary educational preparation, and who enjoy sound health, will be able to do this.

The schedule of studies and further description of the several lines of work and study will be in readiness soon.

For further information address the undersigned,

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President S. D. A. Medical Missionary and Benevolent Association Board.

SANITARIUM PARLOR LECTURES. (Oct.10,'95.)

M E M O R Y.

J.H.Kellogg, M.D.

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Good Evening, Ladies and Gentlemen: I was asked a few moments ago to talk to you about memory. One of the most interesting of all nervous phenomena is what we term "memory". What is memory? and how do we remember? For a long time physiologists have made a very careful study of this subject, but have failed, even in the smallest degree, to unravel it. And it can hardly be said, at the present time, that anybody understands, fully and completely, the phenomenon of memory. Still we know something about it. I know of no better illustration of what memory is than a simple, natural phenomenon with which every one is familiar: Sometime in going through a forest, or along the road near a grove of trees or a piece of woods, in a dark night, you have noticed by the wayside something shining, and the nearer approach to which proved on a closer approach to be a rotten stump or a half-decayed log. Or, walking by the seashore after dark you have seen on the sand, which proved to be something bright and shining; and upon inspection you found it to be a decaying fish or a mass of oyster-shells. This phenomenon is sometimes called phosphorescence. It has not until recently been known why these decomposing substances under certain conditions have the power to throw off this peculiar light, but it is now understood that this phosphorescence is due to a peculiar capacity of certain substances which is developed for storing up the sunlight. If you have these same oyster shells and grind them into a fine

powder and ~~make~~ a little ~~paint with~~ mucilage and coat over ~~a lit-~~ ~~tle of~~ the surface ~~and~~ expose ~~this surface~~ for four or five hours to sunshine during the day ~~and during the night~~ ~~and you will see~~ it shine ~~bright~~ enough to read by, if the surface ~~is~~ quite a large one. A proposition has been made,--and I think ~~the~~ ~~experiments have been tried~~ to utilize this property of certain substances ~~of oyster shells or of kindred substances--for~~ evening travelers ~~to see the time by the clock~~ during the darkest night ~~without illuminating the clock; and it has been utilized for~~ watches ~~in this way~~--a phosphorescent watch-face ~~in every state prison of Siam and India.~~

Now what is this property ~~of these substances~~ which enables them to throw off light in the dark ~~or~~ substances which have no illuminating power in themselves, ~~but act by a borrowed property~~--what is this ~~illuminating property or sensation~~? How did these substances ~~get~~ this ~~property~~? ~~what is this property~~ and in what does it consist?

It is generally understood that light consists of undulations of ether, ~~as it is termed~~, acting in what are called certain minute vibrations. Now the rays of light striking upon any object, no matter what it is, have the effect to change that object. Every surface upon which the sunlight falls is chemically changed by the action of the sunlight, ~~which acts upon this surface. We are familiar with photography.~~ The photographer has a plate covered ~~over~~ with albumin and ~~with~~ a little nitrate of silver or similar chemical substance to render it sensitive, and when a picture ~~of face~~ is thrown upon it, the rays of light, producing a chemical change in the ~~chemi-~~

~~cal~~ substance which is diffused over the glass plate, and makes lines corresponding to the ~~lines~~ this of the ~~picture~~ picture thrown upon it, ~~the reflection of the light lines making corresponding dark lines,~~ ~~this~~ This is called the negative. Then by allowing the negative to lie enclosed in the plate over a piece of paper made sensitive in the same manner as the plate, ~~xxx~~ the light shines through ~~the dark places faintly~~ and reproduces the lines which make up the ~~person's face,--the light shines through~~ pictures, the dark places making light places, and the reverse, ~~the light shining through light places making dark places.~~ Now the sunlight also makes changes in phosphorescent substances which sets them in vibration,--~~the light makes~~ it causes the same changes to take place in these phosphorescent substances as are produced by the light ~~itself~~ upon the negative. The rays of light produce in phosphorescent substances vibratory movements like the light itself, and These ~~se~~ phosphorescent substances give off, in the night time, the same sort of vibrations as those that have been shining upon them in the rays of sunlight. These molecular movements set up in the phosphorescent substances are reproduced in the night time, ~~--and in the day time~~, as well as in the night-- but when the rays of light shine upon these phosphorescent substances producing vibratory movements they immediately give them off, but in the day time, the daylight is so much more intense that ~~this light~~ the dim light from the phosphorescent substances-- is not seen, ~~but in the dark, this dim light is seen. The short of it is~~, the phosphorescent substances, those substances which give off light in the dark, ~~have been storing~~ up sunlight during the day, ~~and this is done by the change which the sunlight produces in~~

capable of
~~them they are sole to~~ reproduce the same sort of vibratory move-
that
~~which~~ is the foundation of the sunlight, so they reproduce
the sunlight.

Now that is memory. The piece of rotten wood in the for-
or the oyster shell by the seashore
est, ~~when the sunlight shines~~ upon it in the daytime, remembers
that has shone upon it during the daytime
the sunlight and reproduces it in the darkness. ~~The same thing~~
~~is true of the oyster shells.~~ The power to remember consists in
the change produced in the shell or piece of rotten wood,--all
phosphorescent substances ~~xx~~ are capable of giving off this phos-
the former which preserves
phorescent light--all these substances ~~are capable~~ of storing up
the ~~se~~ vibratory movements by which a change takes place in their
structure. Now ~~that is memory, as I said, and~~ we remember in pre-
cisely the same way. The impressions which come into our brain
because the
are simply vibrations. When we hear, it is ~~simply~~, sound waves
the
~~that~~ have communicated movements to ~~our~~ ear-drums and the ear-drums
has
~~have~~ communicated the vibratory movement to the bones of the ear,
and thence on into the brain; and there we have vibrations produc-
ed in the brain cells, --the cells which have charge of the sense
of hearing. These cells store up those vibrations in just the
or an oyster-shell
same way that a piece of rotten wood stores up vibrations of light,
and in the same way that the oyster-shell stores up vibrations of
light. So when rays of light shine upon the eye, a picture is form-
ed in the retina, and this picture is produced by the vibrations of
light. ~~There are certain changes which take place in the retina,~~
~~and the retina is simply the optic nerve spread back of the eye~~
~~ball~~, and ~~the~~ these nerves which are spread out there to receive ~~ing~~ these
impressions from the rays of light transform the object upon which

they fall so that they form a picture in the eye. These changes are communicated back into the brain,--these vibratory movements are transmitted by the optic nerve into the brain--to the nerve cells at the base of the brain that have charge of the sense of sight and the movement, the impression produces a change entirely akin to that which takes place in the oyster-shell when the sun shines upon it. So we have a change in the structure of these cells when we have seen a beautiful picture or landscape, no matter what it is, when we have heard a sound, no matter what it is,- we are physically changed- we are not the same object as before. When we look at a beautiful picture or landscape it perhaps infuses our whole soul with its transcendent beauty, and we are changed, we are a little higher up, (Interruption) I was just remarking to you about the effect of everything we see and everything we hear,-- When we see a beautiful picture of any sort or a beautiful object or any beautiful thing or pure thing,--a sweet thing--a thing that inspires in us good motives and good thoughts, a picture that is beautiful and pure to look at--that thing raises us a little bit; it makes us a little bit better; it makes us a little more angelic; it makes us more divine; it makes us a little more heavenly. And when we look at a thing that is impure or ugly, if you please, a thing that is hateful or repulsive or loathsome, that thing transforms us in the opposite way,--it lets us down a little- and we are actually transformed. That is the physiological interpretation of the divine statement, "By beholding we become changed." This is an actual fact; it is a scientific fact, that by looking at a thing we are actually changed, we voluntarily form

~~photographer's plates of ourselves, if you please.~~ We are more sensitive than any photographer's plate; all the objects about us are being pictured in our being. ~~We are made up entirely as are the most sensitive sort of photographer's plates; We take pictures more honestly than any photographer's plate;~~ All the impressions ~~about us~~ which come to us through our various senses, sight, touch, taste, smell, hearing, ~~under which we live~~, all are making pictures upon us. These impressions are ~~making pictures in us;~~ they are transforming our brains and nerves; they are modifying, more or less directly or indirectly, every structure in our bodies. The same thing is true of what we hear--beautiful sounds, lovely music, delightful harmonies elevate us; they lift us up; they transform us in such a way that we afterwards live on a higher plane; it may be imperceptible to others or to ourselves, nevertheless it is true that we live on a little higher plane than a child that grows up in sweetness and beauty, with an atmosphere of harmony about it, ~~that has about it~~ and the charm of music, beautiful pictures, and lovely and pleasant things, ~~all about it~~ is a higher being than a child that grows up in the slums ~~with~~ amid wrangling and ~~horrible~~ disharmony ~~about it~~. ~~Such a child is~~ The child is full of the kind of pictures with which he has been surrounded; he himself is constructed on a different plane; he is modified by different impressions; he has actually grown into a different kind of mould than he would have been if he had had a different experience in life. Thus with us all, our circumstances and enviroments are a mould in which we grow because of the power of our bodies to remember everything. because of the fact, as I said we are photographers plates of the most delicate description.

Now every sense does the very same thing for us as does the sense of sight,-- the sense of touch, the sense of taste, of smell, of hearing, of temperature--all the different senses of our bodies have the effect to picture upon us--or rather to picture in us the things that are transpiring about us in such a way as to make us different from what we would have been if we hadn't had these experiences ~~to make us different beings, and to~~ give us a different structure from what we would have had if we hadn't had these experiences.

(Now how shall we apply this principle to what is called memory?) We ordinarily get the idea of pictures from things that we see, but there are sound-pictures just as well as sight-pictures, for all the things that we hear are pictured in our brains just as much as are the things that we look at. The things that we feel--touch pictures if you please; the things that we taste are taste-pictures, the things that we smell are olfactory-pictures,--all these things are pictures in our brains just as really as are what we call sight-pictures. So much for what memory is.

Now how do we remember? How do we recall the things that we have heard and the things which have occurred in our experience? How do we recall the scenes through which we have passed and what we have thought in the past? ~~We will~~ (Let us) consider for a moment how we remember — facts ~~is~~ are stored in the memory. When we see ~~a thing or when we~~ feel ~~a thing, or~~ hear, ~~a thing,~~ or think a thing, that thing is stored in the mind. As before suggested. This storage consists in an actual change in the brain, ~~as before suggested.~~ Now what is that change? ~~This change is something more than a change of structure.~~ At We must first briefly the structure of consider ~~for a moment what~~ the brain ~~is.~~ That is a large subject, and too large to bring out fully in a few minutes talk--and especi-

ally without having even five minutes for putting things together. The brain is made up of cells. If you take a little bit of the brain and put it under a microscope and examine it you will find a number of little cells in it. Here is a picture that will give you something of an idea of what these cells are (Referring to chart) Here are three of these brain cells lying side by side. This is a picture pond amoeba. You may go along the road perhaps and see a stagnant pool or a little pond among the weeds and as you walk up near it you will see a little slim on the surface; you take a little of that and examine it through the microscope, and you find that it is filled with little creatures of various classes and among others you will find the pond amoeba, which is a little jelly-drop not more than a .500 of an inch in diameter; it is simply a little transparent drop like a drop of jelly. It has no feet or legs, and yet it has the power of locomotion; it has no hand and yet it can take hold of something; it has no mouth and yet it can eat; it has no stomach and yet it can digest; it has no brain or nerves, and yet it can feel, and it can grow where it likes and seems to have volition. This little jelly-drop has all the essentials of animal life; it is the quintessence of every animal function--they are all represented there; the power of thinking, the power of feeling, and of memory is there, as well as the power of digestion,-- xxx x xx as well as in the human body. This little bit of a jelly drop, when it is resting, is as round as a drop of water. (Referring to chart) This represents it when resting. When it wants to know what is going on in the neighborhood, as it has no eyes it reaches out its fingers or its arms (Referring to chart) Here are some of its pseudo-podia or feet. It

finds something out here that it wants and it thrusts out a part of itself--it expands a portion of itself--it spins itself out as a spider spins out its web, and thrusts out a part of itself to find out what is going on. If it finds a a germ it eats it up,--that is a part of its duties--to find germs and digest them so they wont multiply. It fastens one part of itself to something and then draws itself up to the object which it wishes to reach,--here is one (Chart) and this is the way it is traveling; here it is putting out a foot; it will soon drag the rest of its body up to this point as an earthworm drags itself along. Now it is feeling its way; it does not know where it wants to go at present, so it is exploring the country around it. When it finds where it wants to go it fastens the rest of its body and draws itself up to it. Here is a germ that has gotten inside of it. The way it does this is simply to make a little mouth and enclose the germ or object which it wishes to eat within itself and so it gets its inside where it is all stomach,--it is all stomach inside, and it is all mouth outside, if you please. (Laughter) So this little infinitesimal creature is able to do almost anything that you and I can do but in a very simple way; it represents the lowest form of life (the brain, like every other part of the body,

~~Our bodies are made up of little creatures like the amoeba.~~

Each of us is a community, if you please, composed of little creatures like this amoeba; ~~our brain is made up of~~ little creatures (is made up of little cells,— having the power to think and feel. Our liver is made up of a sort of amoebas which has power to make bile; our stomachs is made up of different amoebas having the power to make gastric juice,--and the same is true of the muscular fibers which squeeze the food

Now this city is a unit; society is a unit, in a certain way every community is a unit, and the individuals making it up are simply the portions that compose it. Now in the individual that we call Battle Creek we have some units,--some blacksmiths, some carpenters, some men of leisure, some drygoods merchants, some hardware merchants, &c.--a few doctors, clergymen,--and I believe a few invalids--people that have no particular occupation--I think they call them valetudinarians. The same thing is true of the body; this skin that covers the body is the wall, if you please, that surroundsthe city, and inside of this city wall there is an infinite number of individuals of different trades, each doing whatever kind of work is required of them.

Now in the brain we have a certain set of these little creatures set apart for doing a certain kind of work, and they look like this pond amoeba. ~~(There are about ten billions of these little creatures in the brain, each one of which is more a live thing than we are as individuals, or communities--for we are communities as well as individuals.~~ (The reason we are able to concentrate our energies and carry out our own purposes of various sorts, is, because all the different individuals of our bodies ~~are~~ work~~ing~~ together in harmony.)

But you say you don't believe we are individuals. I can prove it to you quickly. Suppose I cut off a little bit of the end of my finger,--I immediately put it back--it will grow fast, if I take good care of it, as before. Now suppose I cut off a little bit of the end of my finger and cut off a bit of another' the man's finger and put a little bit of my finger on the end of the other man's finger,--it would grow fast there if he took good care

of it. I had a little experience of this, which I will tell you. (It sounds a little egotistical but I will state it merely for an illustration of what I mean.) Sojourner Truth--how many of you remember of seeing her? Hands up. There are many hands up. She lived in Battle Creek then --a number of years ago. "I asked her how old she was. She says "Oh, laws, sonny! I never told my age?"" She was something over a hundred years old--I suppose she was xxxx about 114 or 115 years old when she died. Several years before she died she came here and the year before she died (1883) she had a great ulcer as big as my hand growing clear around the left leg and she wanted to know if I couldn't do something for it. Before I called upon her she sent me word that I needn't come to see her because she said she thought she was too hardy and stocky for me--that she was too tough an animal for me to doctor; that she wanted a horse doctor, that if I came she wanted me to come with a horse doctor. She finally sent for me and I undertook to cure that terrible ulcer. After trying various remedies without success I made up my mind to graft on some skin to grow up over the big sore. I asked her if she knew of anybody who could furnish sufficient epidermis to splice out what was wanting on that leg. She said there are my two little girls--30 and 90 years old--but when the proposition was made to them they fled screaming from the house and ran to the neighbors for safety and I was left to nip off some pieces from my own arm and graft them on her limb, and a few weeks after that there was a large white patch of skin growing around her leg. This proves that there is an individuality in the different parts of the body , and in the merest fragment of the skin. These little bits of skin had grown upon this new ter-

ritory and retained their individuality because the little cells of this skin had their own characteristics and they retained them just the same as though they had grown upon my own arm.

Another illustration, is the fact that if you graft scions of apple trees, &c.-you can take a ~~xit~~ bud from a sweet apple tree and graft it into a ~~sour~~ apple tree--a crab-apple tree even,- and it will grow sweet apples upon that tree, because that little bud that is grafted into the crab-apple tree carries with it its own individual characteristics and cells just the same as they were upon the sweet apple tree in the first place.

~~Now~~ and every cell in ~~the~~ body has ~~its~~ a certain kind of work to do and a capacity for doing ~~their~~ that particular kind of work, ~~-that work that the Almighty~~ which has designated ~~it~~ to it, by the Creator, ~~gave to each one of these little cells its particular duty.~~ There are ~~So it is with the brain of the~~ ten billion cells of these cells in the brain, and ~~of~~ each one has its particular function, and is as much an individual as we ourselves.

~~Now how do we remember? These cells of the brain are like~~ this,--here is a picture of the brain (chart). These cells of the brain have arms ~~as you see here,--here are~~ some of them, or poles, as they are termed. ~~you~~ see arms reaching out from them and they have legs or long arms.

~~Suppose this is one of these cells, if you please.~~ Some of them ~~have several poles, as they are termed;~~ some of them have two or three poles, and some have a great many, ~~--some are multipola cells.~~ Suppose this (diagram) represents one of these multipola cells: One of these poles runs off to a great distance across in this direction. (Some of them are long, but most of them are short)--suppose this represents the short ones, and this represents the long ones; (~~every~~ cell has at least one long arm) ~~running out perhaps two or three feet~~,--it may be very much shorter than that. Then there are

short arms which run out only a little distance. (These poles run out and then branch off, these branches running in other directions until they finally end in what might be called a sort of brush like this (diagram) Suppose we have one of these cone up like this, branching off and sub-dividing (illustrating and explaining). (The whole arrangement is very much like an electrical apparatus.)

(Now when nerve energy, or nerve impulses, are received by the cells, the energy originates in the cells. Suppose this is a cell through which sight impression is received: (Every cell is modified more or less; it is made to act in a different way than it did before, by the impression made upon it,--just as the oyster shell acts in a different way from what it did before the sunlight fell upon it; it would act differently from what it did before--it would make a different impression from what it did before. Now here is one of these brushes alongside of one of these cells. (These brushes seem to be possessed of the power of affected by induction.) You know when you go down to the static electrical machinery in the evening and the electricity is turned on each individual hair stands on end; that is because each individual hair is charged with electricity, and hence each hair repels the other hair and they are repelled so strongly that they have to get as far away from each other as possible. That is the reason they stand up. (So when a cell receives an impression through one of the senses, by its power of induction the impression is transmitted along the pole to the little brush, which sends the message along to other cells. In this way the cells of the brain are brought into communication. The stronger the impression, the greater the number of cells affected.)

way, and certain paths are formed by this means,-- what are called paths are formed in the brain, and different groupings are formed; different cells are grouped together in receiving these impressions.

Now I will illustrate this idea in another way: I have upon this box of chalk several little bits of chalk; I tap the box and you see three or four bits of chalk move. Now when I tap it a little harder (tapping) three or four more bits of chalk move. When I tap it a little harder more pieces move,-- and when I tap it quite hard every one of these pieces move--and even the table moves. Now you can imagine that I have a large table with a thousand pieces of chalk of different sizes and shapes and positions,--some of the pieces standing upon end, some lying down, &c. Now you can readily see that there might be a number of different ways in which these bits of chalk will move if I strike the table. So it is when an impression comes through the eye for instance into the brain. When the impulses begin to travel along these poles, are taken up by these brushes and carried up to other cells--you can see that the number of impulses depend upon the strength of the impression.

Now suppose you were passing along the street and see something in a shop window; you just glance at it; it has some glittering impression. An hour afterwards you try to remember it, and you can't recall it unless you have kept thinking about it. If you just caught a glimpse of it you pass on and it is forgotten. On the other hand suppose you are standing looking at some object and some catastrophe happens before your eyes-- sup-

posing you are standing upon a bridge and see a man suddenly spring into the air and fall into the water below,--that picture follows you to your dying day ; you will never forget that picture; it made such an impression upon your mind that you will never forget it. Now what is the difference between the strength of these impressions, and what is the cause of that difference? The difference consists in the impressions which you receive when you were hurrying past the store and merely glanced in at the shop window and received only a slight impression which was like the impression made by giving the box, a little tap which set in motion only a few cells out the great mass of ten billion cells of the brain,--they were so few that it is difficult to find the impression; but those few cells that are affected, are affected forever, that impression will never be removed entirely, but the number of cells affected is so small that they are engulfed in the great mass of other impressions, so that when you come to look into your brain for that picture which is stored there you can't find it,--it is like trying to find a pebble in the ocean--it is like trying to find, I might say, a drop of colored water that you drop into Lake Michigan; you know it is there but you can't find it, because there is so much else there. Now in the other case in which you saw the man jump into the water, the impression you received is like giving the table a big rap; it is because there is a stronger impression made. So ~~When you see an object which is~~ we see a very striking object, the impulse is so strong as to affect ~~a great number of cells in the brain impression which causes~~ a great number of cells of the brain in turn send out a large number of impressions ~~to travel out far and wide into~~ to the outlying provinces of the brain, ~~so that every cell is set in motion and all changed by this impression.~~ So when we want to recall that

~~to~~ the picture ~~in your mind~~, ~~you~~ we don't have to look far to find it. You can go into the brain ~~xix~~ territory almost anywhere and find it,--you can find some cell that has been influenced by the impression, that is easy to find; you must find a cell that has been modified by the circumstance that you are looking for,--that is what you have got to find. You might suppose, if you please, that we have here a lot of shells and the sunlight falls upon them imparting different colors to each. Then suppose each one of these shells has the power of reflecting the same colors as that which falls upon them,--the green light, which has fallen upon one, the red light, which has fallen upon another, &c.--suppose each one of these will give out the same light that shines upon it (This is not correct but it is an illustration) of memory). Impressions have been made upon your mind by different circumstances, modifying the different cells, and when you look for a picture in memory you will find it when you find the cell that has been modified by the particular circumstance which you wish to recollect; you want to look for that cell. Now, as I said, if this circumstance which you are seeking to recall has been a striking one, so large a number of cells have been influenced by it that you do not have to look far to find at least a few of these cells that have been thus influenced; they are scattered all about that portion of brain territory. So you see memory depends largely upon the strength of the impression made

(~~And how do we remember?~~ Thus we remember ~~by means of~~ by getting into activity again the~~se same~~ cells which were ~~once active~~ modified when the circumstance we wish to remember occurred) ~~if a circumstance~~ occurs and we want to recall that circumstance, we must get these

same cells active again which were once active. (~~Now~~ the way in which we ordinarily get these cells into activity is by simply setting the brain to work to look up a circumstance, or we think, "Now what was it that happened yesterday,--let me see. ~~I met a~~ gentleman yesterday, and what was his name?" and thus we begin to ~~think.~~ Now when we begin to think in that way, we are trying to exercise the faculty of memory ; we are trying to trace it; we are trying to think of the man's name that we met yesterday.) How do we go about it? Perhaps we begin to think about the man himself if we can't think of his name we try to think where we saw him and the circumstances under which we saw him and what he looked like,-- we begin to think of what he said, thus coming down closer and closer to where the man was located in our brain (blackboard) that is the way we remember,--we skirmish around across this territory to see where he is,--striking across this way and that way, thinking about what we talked about, &c., making excursions across the field of our brain to see if we cannot strike him somewhere, and ~~by and by after we have stopped the effort to recall him, when we~~ have been talking ~~about~~ something else, ~~and thinking of something else~~--all of a sudden the circumstance ~~pops into our heads.~~ How did that happen? That is because ~~we have set our brains on~~ ~~when,~~ we have started some of these cells that were modified yesterday, in connection with ~~that man,~~ and these cells have set up a vibratory movement ~~going~~, and that movement has kept going on and on with the search ~~that we started so that it has propagated itself~~ It is like setting ~~up on each~~ a thousand bricks a little distance apart, and tipping ~~one~~ brick over, ~~and the first brick~~ knocks the next one over, and the next tips another over, and another, and

another, until they all ~~tumble~~ fall down.) When you make the series ten billions long and find the first brick and tip it and that brick tips over the next and the next, &c., --we have started a chain like that in our brain and it is carried along even though we have the other cells at work at something else. (That is the result of starting up anew some of the activities that were in process at the time we stored away the thing we wish to remember.

You see then that it makes a difference as to how we store things away in the brain, as to whether you can find them or not. If we wish to find a thing easily in the brain, we must be sure that a sufficiently large number of ~~brain~~ cells have been brought into action in connection with its being taken into the mind ~~the thing taken~~ ~~so as to be able to find~~ it easily when we come to search for it.)

Take this simple illustration. Suppose (blackboard diagram) this represents the area set in operation in connection with a certain event,--there will be only this number of cells set in motion--let this if you please represent the great mass of the brain. Now there is only this much set in operation in a particular case. Now suppose that instead of that portion put in operation we had this much in activity. Now you can readily see that when we set our minds at work to find that object, that if we have only the cells of this little territory in activity that we will have to strike into this territory of the brain to find where the thing is. If we strike in here we will set this whole mass of cells in operation and it will soon bring out what we are seeking for; but if we commence here (referring to diagram) it would be a long time before we could strike this group of cells and bring out ~~xxxxxxxxxx~~ prominently the particular set of ideas that we are after. So it is

important that we should make just as much of an impression as possible in the brain when taking in a fact that we wish to recall. You see evidence of this in a child that has not been taught anything at all,--a young child--perhaps a baby not three months old--suppose it is six months old--just beginning to observe things about it in an active way ; we give that child an object; it takes the object in its hand; it takes it and feels of it at first,--it looks at it, puts it in its mouth and tastes of it--it would smell it if it had any olfactory properties about it--the child investigates the object in as many ways as it can. If it sees the moon it reaches after it; it is impatient because it can't get the moon,--it wants the moon; it cries for the moon, and it would taste it if it could get it into its mouth. It is investigating in that way, tasting it, feeling it , looking at it so that it can get as much of an impression of it as possible. If we simply look at a thing , there are only a small number of cells of the brain put in operation, and hence only a small impression made. If we put in operation a large number of cells there will be a strong impression, if we taste it, smell it, &c. there are a larger number of cells put in operation--more than if we set down and merely think about it; When we unite the brain-pictures and the sight-pictures and the sound-pictures and the touch-pictures and all the different pictures and then when we think about it we put bonds between all these different pictures, so that when we strike one we can recall another and in this way we can get the whole brain enlisted (By dwelling upon ~~the~~ a subject long enough, we can get the whole brain so thoroughly occupied and enlisted in thinking about it that we ~~can~~ will never forget it .)

~~So I think I have made clear the fact that in memory it is~~ becomes very important that we should store the thing ~~up well~~ carefully which we wish to recall; that we should make a strong impression in the brain; that we should enlist just as large a number of brain cells as possible in remembering the thing.)

There is another thing in reference to storing matters in the brain so as to remember them well,--another very important thing--and that is the order in which we put things away in the brain,-- I must say a word further, however, in reference to the way in which things are taken into the brain, and that is, that in order to remember a thing well, we must have the whole mind concentrated upon that thing. Take for example a boy sitting in a school room: His teacher is talking to him upon some subject--or a person sitting in an audience perhaps--some one is speaking and his gaze goes away off into space, or he is looking blankly at the wall; although that person is hearing, he is not going to remember a thing that is said; he knows what is being said, he hears the words but he is not storing them up; they are simply going into one ear and out of the other, as the saying is, it is simply a fleeting impression; the impression though made, will be lost in the great multitude of pictures which are already in his brain, and he can't make it stand out plain enough from the rest so that he can distinguish it. I will illustrate this: Suppose you go to a photographer to have your picture taken; it is necessary for you to sit perfectly still for ten seconds to get a good picture of yourself. Suppose the photographer points his instrument at you for a second, and then at another person for another second, and then at another person for another second, &c. pointing the

instrument at ten different persons for a second each,--it wouldn't be a complete picture of either of them--it would be a sort of composite picture; it would be hard for you to recognize yourself in that kind of a picture. Now suppose some one is speaking to you, and you try to hear him, and then some one else speaks to you, and then some one else, and so on,--you have the pictures all in your brain, but they are confused, one picture overlapping another ~~picture~~. All these things that you have heard have been in your consciousness, but you can only find a fragment of one and a ~~xxx~~ bit of another, ~~and a piece of something else~~--all these pictures have got ~~matched~~ mixed together in such a way ~~that they have made~~ as to make a sort of ~~crazy quilt if you please, of the pictures,~~ composite picture instead of ~~giving~~ a clear, definite and sharply defined image in the brain.) So when you look after that thing you ~~don't~~ try to recall that circumstance or subject matter connected with it, but instead of finding a fine piece of silk if you please or a fine piece of broadcloth or velvet—instead of that you have a crazy quilt--a number of different pieces all patched up together--because that is the way you got hold of them--they were put into the brain in that haphazard way, and they come out in that haphazard way. (Thus, To remember a thing well, one should fix the mind and attention upon it so thoroughly as to make a ~~strong impression and a~~ clear, well-defined ~~clear cut~~ impression in his brain,--in other words, he must give his whole attention to it; that is what attention means,--it is to; it is to put the whole mind and soul upon the thing to be remembered, the matter in hand; that is attention.

Another thing in reference to remembering--in reference to storing ~~up~~ things in the mind--it is a good thing to put them away

along with other things of the same sort. Suppose for example, after making purchases at the store you take them home and when you get inside of the door you drop them down somewhere. You make another purchase of a different article and bring that home and drop it in the same place and so on purchasing half a dozen different articles,--such as music, medicines, food supplies, &c. and then drop them down with the others; pretty soon you lose all track of any particular article,--there is simply a lot of odds and ends and when you wish to find anything it is likely to be buried up in such a miscellaneous lot of articles so that you wouldn't know where to find it. But, if, instead of that, when you purchase different articles and take them home, you put the medicine in the medicine chest, the food supplies in the pantry, the dry goods in the wardrobe, the pictures in the parlor, and the music on the music rack--whatever you purchased you put exactly where it belongs--each in its proper place, and then, when you want to know where it is you know just where to find it, because it is with other things of the same kind. ~~That is~~ (Another important thing to do ~~in study~~ if ~~you want~~ one desires to remember things is to put it with other things of the same kind.) When you take a thing into your mind, think of other things that are like ~~that thing~~ it. Then if you wish to call to mind other things that are akin to this thing, that have relation to it,--if you think of these things when taking other things in, which you wish to remember, they will then go into the same channel, ~~because putting~~ and these related things ~~into the kind together~~ will be glued ~~then~~ fast together, so to speak, it is a sort of cement by which these things that you brought into the mind are attached, like the tail of a kite, all these thoughts are sailing along in your brain, to use a simple figure.

(This is very important, especially to the students.)

But some people do not store things away in the mind in regular order, nor with things that are related to eachother,--it is simply like tossing a number of miscellaneous things into a garret. You don't know what you are going to find in a garret, or how to find what you are seeking; you have got to rake over everything in the garret to find what you want. So it is with many people's brains; (~~they~~ many people store up everything in their brains in such a haphazard way that their memories ~~of things are just~~ like a ~~a irregular~~ miscellaneous assemblage of things in a garret. ~~It is a good thing,~~ if you want to put ~~a thing that you have seen~~ something where you can find it in your brain, to attach a string to it.) The brain might be considered a kind of store house in which everything that is put in there has a string attached to it, so when you want it, if you only know where the string is which is attached to that particular thing you know it is at the other end of the string, xxx xxx xxxx so you must know which string to pull. To make this point clear, I should have to spend more time than I have this evening; perhaps Ix will take up this subject at someother time.

I will tell you a circumstance which will assist you in understanding what I mean. Sometime ago a lady was here, whose name I could not remember, although she had been here six months. Her name was so simple that it was absurd, as it seemed to me, that I couldn't remember it, my brain happened to be so constructed — finally I seated myself by the window with the determination that if I could remember that name I would fix it in my mind so that I would never forget it again ; I wished that I could remember it,--it was exceedingly distressing to me that I was not able to remember her name when I met her. I could have asked her name, but it was

annoying to me not to be able to recall it at once. One day she came into my office and made a complaint about Robert. At that time we had a young man here named Robert who was the room clerk. She said she had had a little squabble with Robert about the rate of her room, and that she had no further use for Robert; she didn't want him around there. Her name was Tait, and I fixed that name so that I have remembered it; I will tell you how I remember it. I made a little correlation in my mind,--I said, "I will always remember Robert because he is always here; I know his name and he has the rates of the rooms, and the rate is what caused the hate of Mrs.Tait, so I remembered the name by the connection, Robert, room, rate, hate, Tait. (Laughter) By that means I remembered the name that I wished to remember,--by attaching ~~xx xxx~~ one end of the string to that lady's name and the other end of the string to Robert; I could always remember Robert, so he was a kind of hitching post or stake for the string, and so long as I remembered Robert I could remember Tait. When I was coming into the door here this evening I happened to think about it; as I was just asked to talk about memory, I said "I will see now if I can remember that name that I have been trying to remember and could not; and instantly 'Robert' came to my mind; I could not recall the lady's name at first, but I remembered Robert and in the course of a few seconds I got back to the lady's name by following up the connection or the string--Robert, room, rate, hate, Tait.

The same principle applies to any number of things; you can remember anything you want to by correlating ~~them~~ *it* with something that you always remember,--if you want to remember something, just fix that thing with something that is so familiar to you that you

cannot forget it--tie a string to it; for instance you want to remember the name of the presidents of the United States in their order. I was riding in a car at one time, and not having anything else to do I said, I will see if I can't fix the names of all the presidents in my mind so that I cannot forget them." Then I said "Here is Washingtonx who was the first president,--I can always remember that and I will tie a sort of string to it." Then I said "Washington,--that sounds like washing--washing day; that means clean clothes! The name of the next president was Adams." Now how was I going to connect clean clothes with Adams? Ofcourse Adams had clean clothes, but that wouldn't do for me because everybody else had clean clothes. But the idea occurred to me in a minute that there was an Adam who didn't have any ~~clean~~ clothes. (Laughter), So to remember the name of the next president after Washington I will say 'Washington, washing day, clean clothes,--then I can easily remember that Adam didn't have any clothes because it is such a striking circumstance, so I get the connection Washington, washing day, clean clothes, Adam no clothes, Adams. In this way we can remember all these names as well as we can remember anything else. You don't have to keep them all in mind; simply have the starting point in mind and have all the rest connected with the starting point and arranged in a string like a string of beads,--one comes off and then the rest of them come right along after it. This scheme did not originate with me; it is what is called the Memory System by Loisette,--although it did not originate with him. He has compiled a number of systems and brought them into quite a harmogenious and consistent whole and quite a satisfactory method. It is worth one's while to study it

as an aid to the memory.

But these are only systems to be studied and practiced for the purpose of making it easy to remember. The only way to be able to remember well is by exercising the memory and making it more and more strong and active, and by concentrating its energies on the subject which you wish to remember. Thus it will become more and more active and able to retain things. But I will say no more to-night lest I weary you so that you won't remember anything that I have said. (Laughter and applause.)

Keeping until they are called for.