

Graduation Essay
February 14, 1875

What is Quack.

A very superficial glance at the pages of history is sufficient to convince even the most skeptical individual that the subject of disease has ever been ~~the~~^a ~~subject~~ ~~of~~ ~~the~~ ~~most~~ ~~important~~ ~~secret~~ about which has developed the superstitions of the ignorant, the speculations of the curious, and the profound interest of the learned. To more critical a scrutiny of the records of the past reveals the fact that from the remotest periods, down to the present, which have left this same inevitable subject with its ancient name, has formed an important element in the foundation of human government. Perhaps we are not going beyond the truth in saying that even the whole superstructure of ancient mythology grew out of the prevailing notions of the nature

By John Harvey Kellogg

Maria Bellows.

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of disease and its causes, because
 it is, at least, that the ^{numerous} credulous and
 religious dogmas which have at
 various times obtained among
 mankind have been greatly in-
 fluenced, if not wholly controlled by
 the co-existing beliefs relating to
 disease and its causation. Religious
 teachers have ever found in the
 popular dread of disease a power-
 ful medium with which to enforce
 their doctrines, whether true or false.
 Quacks and charlatans have found
 a fertile field for their nefarious
 operations. And philosophers,
 both ancient and modern, have
 by this theme been afforded quite an
 inexhaustible subject for the ex-
 ercise of the most subtle reason-
 ing, and severest logic.

Previous to the time of Hip-
 pocrates, diseases were universally
 regarded as malignant entities.

sent by medicine or inferior
 skills. That illustrious physician
 and philosopher was the first
 to discover the relation of cause
 and effect between physical agents
 and disease. He ^{first} pointed out the fact
 that diseases owe their origin to
 the transgression of certain laws,
 the observance of which insure
 health. As a talented writer remarks,
 he "gave the death blow to supersti-
 tion," although some vestiges of that
 noted impediment to progress still
 remain, ~~at~~ at the present day.

Although we cannot attempt to
 defend the particular theory advanced
 by Hippocrates or his followers in de-
 fining disease to be a disbalance-
 ment of the humors of the body,
 a disproportionate amount of
 blood or phlegm, or bile, according
 to the season, it is evident that
 his idea was fundamentally

correct in attributing disease to certain derangements existing in the body, resulting from extrinsic physical causes.

* As we do not purpose to attempt in our limited space a review of all the various theories of disease, we shall only refer to some of those which seem to accord most nearly with the prevailing scientific notions of the nineteenth century. Perhaps Soranus, the master physician of Greece, came as near the truth as any ancient writer when he declared in simple phrase that disease was a "derangement of the body." This definition certainly excludes any conception of a supernatural entity as the source of the phenomena of disease.

The renowned Sydenham, observing that most diseases ended in recovery, often decrying

the patient with health greatly improved, concluded that disease was "an effort of nature to get rid of some noxious material." He, consequently, held that these efforts are always salutary in character, and that the ^{duty of the} physician was to aid them, or, at least to do nothing to hinder them.

Two centuries later, we find in our own time, quite a variety of definitions for disease. One declares that diseases are simply "perverted life processes;" another says "perverted physiological action;" another, "abnormal vital action;" ^{and still} another, "morbid processes." All of these definitions embody essentially the same idea, although the terminology of some of them might be questioned. They all represent disease as being an action or process in some essential particular of

ferent from that which occurs in the body in health. It is noticeable, however, that neither of these definitions includes any reference to the primary object of disease, or its ultimate results, which were the leading ideas in the definition given by Sydenham. These very interesting questions seem to be studiously avoided; and it is especially concerning these points that the writer wishes to inquire. Hence he would respectfully invite the consideration of the following questions: -

1. Is disease a process intrinsically destructive and malign, or is it, in purpose, conservative and remedial?

In considering this question it is necessary that we should carefully discriminate between the causes and results of disease, and the disease itself. It is equally

important to distinguish between
the primary objects of disease and
the incidental results. Observing
these precautions, we may arrive at
some correct solution of the problem.

If we observe carefully the phe-
nomena of disease, we find that the
living system is the active agent.
If a foreign body be thrust into
the living tissues, an inflammation
speedily ensues; the offending body
is soon loosened by the absorp-
tion or disintegration of the parts
in immediate proximity to it, and
it is surrounded by a copious fluid
of a thick, creamy character, the
distinct object of which is to float
away the offending matter. Again,
if a sinapism be applied to the
skin of a living animal, a white
pore appears beneath it, which is
undoubtedly the result of the de-
fensive action of the system - of

the tissues whose molecular life is endangered. In doing themselves in close contact with an irritating substance, they throw out a layer of serum beneath the epidermis, thus protecting the more delicate and essential parts by sacrificing that which is of less value and destined to be cast off as useless in a short time, ^{if} preserved.

In each of these cases the living system is active, the cause of the disease, passive. The splinter driven into the flesh did nothing, except as a mere mechanical body. The tissues found it encroaching upon them, and they set about expelling it, and this act of expulsion was the disease. Was not this an effort at repair, or remedial effort. So with the sinapism. It did nothing. The tissues raised

a blister to protect deeper parts, which was certainly a most admirable conservation measure. They threw water upon the fire occasioned by the presence of the blister. This, then, was remedial effort, even though a portion of the body may have been destroyed. He would be counted a wise general who should by a brave pally save one-half of his army from starvation in a beleaguered city even though he sacrificed the other half in the attempt; for had he done otherwise, all would have perished together.

In the cases supposed, for illustration, the sliver in the flesh was not ~~the~~^a disease; neither, was the suppuration ~~a~~ disease, nor indeed, can we fairly claim that the blister itself was a disease. The process by which

the shiver was expelled consti-
~~tuted~~ the disease of which, it was
 the cause. The vital process
 which produced the blister was
 the real disease which was re-
 casioned by the sinapium, and
 which resulted in a blister. As
 before intimated these relations of
 cause and effect are sometimes
 overlooked, or reversed.

The inflammation which
 accompanies the burning of sinapi-
 um which is as properly termed
 disease, as any other inflamma-
 tion, is indisputably re-
 medial in object. Under the
 influence of adverse circum-
 stances the object may not be
 attained; but this is due rather
 to the malign influence attendant
 upon the case than to the intrinsic
 badness of the vital effort.

severe and general inflammations, although their causes in many times much more subtle and obscure than the cause of traumatic inflammations, are generally supposed to be caused by the presence in the system of some poisonous, irritating, or irremovable material. Can it be doubted, then, that these diseases are merely — efforts of nature to rid herself of noxious encumbrances? If it be granted that this view is correct, then it will also be granted that this large class of diseases are remedial in character.

It is true that these remedial efforts are often unsuccessful, and seem to result disastrously. This is not, however, that they are not salutary in object. It only indicates

that they require direction and management. Nature is not intelligent, and does not reason; she only acts according to certain established laws. She is so impetuous in her resistance to morbid agents, that she will do irreparably the individual she attempts to cure. Here is where the skill and science of the physician are admirably displayed. Nature's efforts must be watched and controlled.

If the foregoing deductions are legitimately drawn, may it ^{not} be truthfully said that disease is a friend, rather than an enemy, as it, ^{is} usually regarded, although unquestionably, a friend that requires surveillance. Should we not rather fear and declaim against the causes of

disease, since the latter is our
best effort to prevent damage, but
to repair that which has al-
ready occurred?

There are many other points
of deep interest connected with this
subject, which we have necessarily
left unconsidered in the foregoing
pages. We have made no reference
to certain chronic affections as pneu-
mia, chlorosis, cancer, tuberculosis,
etc. It may be inquired how these
can be called remedial. We can
only say in reply that many of
these morbid conditions and diseases
are, not ^{possibly} primary, but secondary
in character, being the ^{ultimate} results of
some antecedent affection.

John Harvey Kellogg's
Graduation Essay, Feb. 14, 1875

SANITARIUM LECTURES.

HOW TO LIVE A CENTURY. Feb. 15, 1884.

J. H. Kellogg, M.D.

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Good evening, Ladies and Gentlemen: I suppose there is not a person here who would not like to live a hundred years. A hundred years is the normal limit of life, and everybody ought to live that length of time. Indeed a hundred years is a short time to live. When one thinks about Methuselah, Noah, Adam, and the other fathers of the human race, we see they were all long-lived men, men who lived nearly a thousand years, ten times the number of years that I propose to you to-night as the normal limit of your lives; and that, when you come to think of it, would seem to be a very proper limit of life for a human being.

When one has lived a hundred years, he has only just got a little taste of life; he has only just begun to have a little experience; he has only just begun to know how to get along in the world. To begin to learn really what life is for, and then have to die, seems a great pity. But the average human being at the present day does not live to be a hundred; he dies at the age of forty-two. And yet a hundred years is not an extraordinarily long time to live. I think there is no doubt but what, if the proper care was taken of the average boy or girl born at the present day,--if they had the right sort of education and training from their very earliest infancy up to the end of life, and if they could take proper care of themselves all through life--I have no doubt but that the average boy or girl of to-day is born with stamina enough to carry them through a hundred years.

People do not die natural deaths. It is a very rare thing to

indeed to find a person dying a natural death. A day or two ago, I saw an account of a person dying a natural death: an old lady of about a hundred years was sitting at the dinner table. She laid her hand upon a friend who sat beside her, and passed away in a moment; no struggle, no pain. She had simply got to the end of life. Now that would seem to be a normal way to die. But people do not usually die in that way. We die violent deaths. We die by our own wrong-doing; by our own habits of life; by our doing violence to ourselves all the time.

Now just think of some of the ways in which we do violence to ourselves. Think, for example, how people eat; think of the material that people put down into their stomachs, making bones, blood and muscles out of the things which they are swallowing down, putting into their stomachs, perhaps, with the utmost complacency, things they wouldn't want to carry in their pockets; things they wouldn't want to see combined out of their stomachs, in the way in which they are combined in their stomachs. I have seen things put in the stomachs of people which would make them turn away their eyes in disgust, at the sight of them outside of their stomachs. But without the slightest hesitation people put these various mixtures into their stomachs, without reflecting that these very things are the things out of which their brains, bones, muscles and nerves are made. How often do we think of that? It is really a serious thing to eat,--although I don't believe in **thinking** about eating, while we are taking our meals. (Repeating newspaper theory that "It is a solemn thing to eat!") I don't believe this theory; for, if one should focus his whole attention upon his stomach while eating, his stomach would get into a sort of "stage fright," and wouldn't do anything.

It is not the proper thing for us to do,--to turn our stomachs outward, and turn our eyes into our stomachs in this introspectory way with too close a scrutiny, otherwise we may frighten these poor organs into a state of embarrassment so they cannot perfectly perform their work. I believe that is true. Nevertheless we should think what we are going to do, when we sit down to the table, because what I do here determines just what kind of man I am going to be,--just what kind of bones, muscles and brains I am going to have, and really what kind of thoughts I am going to have, for our very thoughts are born of what we eat. When Prof. Alcott went over to England in 1845, to preach a campaign in favor of vegetarianism, Carlyle, you know, wrote a sort of a ranting denunciation of his theories. He denounced what he called Prof. Alcott's "potato gospel." Of course Carlyle had a wrong idea of the gospel that Prof. Alcott was preaching. It was not simply a potato gospel which he proclaimed, but it was a pure gospel of a non-flesh eating diet. It included everything except dead things. The Professor preached against eating corpses. He didn't believe in that kind of diet, so he went over to England on purpose to preach this campaign against flesh-food and in favor of a pure, wholesome diet such as God gave us,--fruits and grains. But Carlyle proposed to stick to his pipes, his flesh and his rheumatism. One can fairly hear the echoes of his dyspeptic stomach in his books. His gospel was not a "potato gospel," but a tobacco gospel,--a dyspeptic gospel, as one might say.

Now this kind of diet is not the kind of diet that is going to enable a person to live a hundred years. The diet that makes a man dyspeptic to-day, is going to cut off forty or fifty years

from the other end of his life . When I see a man going about with a stomach out of order, I am reminded of a man who once sat over yonder listening to one of my lectures on dyspepsia. (Repeating incident of man who said he had had "more than a hundred different kinds of dyspepsia.") He said that when he came here, his stomach was a "swill-barrel." Now a man who goes around with a swill-barrel in the place where his stomach ought to be, is not likely to live a hundred years. The stomach of the dyspeptic is a sort of garbage-box; he is putting all this disagreeable stuff down into his stomach. The garbage-box contains the relics, the fragments of things which he ought not to eat. Now the dyspeptic has the very same sort of things in his stomach,--sour things,--things not simply sour to the taste, but to the liver, the blood, the brain and to the whole body; the whole body is contaminated. There is not simply a sour taste upon his tongue, but it penetrates the whole man, from the center to the circumference, so the whole man is sour, and contaminated and deteriorated. Now a man living upon such a diet cannot expect to live a hundred years . He is killing himself by inches; he is poisoning himself every day of his life. Every bit of pepper-sauce, ginger, and pepper, every piece of rich pie, every piece of cheese, sausage, ham, and all that sort of thing that goes into a man's stomach is poisoning his blood and cutting off the other end of his life. Now just think what ^{great} slices of your lives you have been cutting off, my friends .

Some of you imagine that all this does not amount to much, but if you look over the ^{would} civilized races of the human family and see how enormously we have deteriorated within the last two,

centuries, you would say there must be something the matter. The average length of life to-day is only forty-two years. You go back a couple of centuries, and you find people living away along, not only up to a hundred years, but away on beyond that. (Referring to "Old Parr," Henry Jenkins, etc.) The human body is the most perfect body that the Creator ever made, and if an elephant can live a hundred years, why should not a man live two hundred years? There is a record of an elephant in Nero's army during one of his campaigns, who lived 200 years afterwards. There are elephants living to-day, who have lived more than a hundred years. They are magnificent animals; but man is the most magnificent animal in the world, and he ought to live the longest of all animals. The finest animal that God ever made, the most useful animal, the acme of God's whole creation, ought to be the longest lived of all his creatures. And why isn't it? Why, the life of man should be "like the life of a tree", instead of the ephemeral life of an insect,--instead of dying when one just begins to live. We ought to live on, and on, and on through centuries. In California, you will find some of the great red-wood trees which are the relics of olden times when trees lived long and grew enormously great, and when animals grew large and lived long,--in the days of the mastodon or mammoth, the glyptodon, and the deinotherium who could devour a whole family at a meal. I suppose Adam must have been eight or ten times as large as any one who lives to-day. He must be a wonderful man who could live a thousand years.

We are not likely to live as long as that, but if we did our best we might live a hundred years, I think. Let us see what old age is. What is the difference between a young man and an

old man, between a young animal and an old animal. The first difference is this: the young animal is transparent. Take up a little fold of the skin of an infant and look at it ~~by~~ ^{with} an electric light, and you will see that it is translucent. Look at the eye of the young child: how bright and clear it is; how clear the sclerotica is, and how dark the pupil is. How strong is the contrast! Look at the eye of the old man, and you see its lustre is lost. Why? There is a museum of eyes in Stockholm, Sweden, and if you will go through that museum and examine those eyes, you will see the reason why. There is a museum of eyes there, from the eye of the babe to that of the old man of eighty years,--the eye of the babe, the eye of the child of five years, ten years, of the young man of fifteen and twenty years--eyes of men all the way up to eighty years, and all preserved with such wonderful skill, that they preserve all their natural appearance, their clearness and brilliancy, or the opposite. They are in exactly the same condition as when alive; they look exactly like live eyes. The eye of the babe looks as clear as plate glass or a piece of quartz, as limpid as water. The eye is clear, up to the age of thirty or forty. It then begins to grow a little dull, and at fifty, it is decidedly opaque. At sixty it is dingy, and at seventy it is so opaque that you can hardly see through it. At eighty, it is as dark as if a curtain were drawn over it.

Now this change in the eye is typical of what is taking place in the whole body; it is a change in transparency. Take a living corpuscle and look through it; it is perfectly transparent. Look at the muscle of a young frog under a microscope; it is so clear that you can see nothing there, until it moves. It is transparent (unless there should be some red blood corpuscles running through it at the time). It is transparent, and you can see

nothing, so long as it is alive. When it dies, it is opaque. Now the young child is so thoroughly alive, and there is such an absolute purity of tissues, and the whole body is so highly vitalized that you can see right through the tissues; everything is clear and transparent. But, as old age comes on, dead matter and rubbish begin to be found in the tissues, the bones, the muscles, the glands, the secreting organs, the stomach, and all the various organs of the body. The rubbish begins to accumulate in the organs, and gets packed in among the tissues, so the tissues lose their transparency; and at the time they lose their transparency they lose their activity, their vitality, their functional activity, and then their efficiency is lost. And by and by, there is something else lost: with the loss of this transparency comes a loss of power, a loss of agility. The joints cease to be nimble; they begin to be stiff, and the old man feels a sort of snapping and grating in his joints, as the result of the loss of this transparency and vitality. Now that is what old age is.

There are some other things that take place in old age. The old man is shorter than when he was twenty-five, when he is sixty,--at sixty, he is an inch shorter than at twenty-five; he is shorter every way--unless he has become obese by accumulation of fat. His lungs are smaller, and his heart and other organs are shriveled up. Age shrivels a man up and makes him smaller, and belittles him. Not only are his liver and other organs smaller, but his bloodvessels are smaller; and these contractions begin at the heart.

In the child, the corresponding relations are about like this: The large artery that leaves the heart and goes out into the body is called the aorta, and the artery that carries the blood

from the heart into the lungs is called the pulmonary artery. In the infant, these arteries have this relation to each other: in the infant, the relation is about 40 - 45 ; that is, if the aorta is 40 millimetres the pulmonary artery is 45 millimeters; it is a little larger than the aorta, so the blood can pass through with great facility ; the blood can go through the lungs more rapidly than through any other part, and it is under such high pressure that it receives the most thorough purification. Now, as the child advances in years, the pulmonary artery contracts; it gets smaller and smaller and smaller, and continues to get smaller, until by and by, ~~until~~ at the age of thirty, it is as small as the aorta; at forty, it is about the same size, and at sixty, considerably smaller than the aorta. The consequence is that the blood cannot so easily get through the lungs, so it is not so thoroughly purified; and the old man gets out of breath easily, because he can't get sufficient blood and blood that is purified, into the lungs. Then the arteries shrivel up, and that is what makes the bones and muscles shrivel up; and that is what makes the liver contract and the heart become smaller. Nutrition fails to supply the arteries and the whole body becomes smaller. Not only that, but when contraction begins the arteries begin to change to a fibrous, woody structure and they begin to shrivel up. This goes on until some of the arteries shrivel up entirely, and then nutrition fails ~~there~~, and that part dies, and the man has what is called senile gangrene which first exhibits itself in a black spot on the toe. The blackness extends up the foot, the artery begins to decay, and the first thing you know, it drops off. This process is going on throughout the whole body of the old man.

That is the reason the body gets old. I think it important for me to give you a little hint as to what old age is, and the process that makes a man old .

Now how can we keep from growing old? The secret of living long, is to keep young; the secret of living long, is not to grow old. One might live long,--almost indefinitely--if he could keep young. If he could keep as young at eighty years of age as he was at twenty, he might live another eighty years. The way to keep young, is to so live that we can retain this clearness of eye, and keep all the nerves, bloodvessels and tissues ^{clear and} active.. If one can do that, he can stave off old age indefinitely .

Now it is worth while for us to consider some of the things which are necessary to keep one young; and one of these things is, to have a right diet. For there is a diet which introduces poisons into the body. These poisons set up the deteriorative changes to which I have referred; they fill the body with impurities and destroy the normal transparency of the tissues; and they continue this process until the whole body is deteriorated and degraded. That is one of the ways in which old age comes on. Errors in diet often produce an undue accumulation of fat, and this results in a degeneration of the bloodvessels, and of the vessels of the brain, and a deterioration of the heart, and by this means one grows old . A correct diet, then, is one of the means by which a person can keep young. This is the reason of the great longevity of some animals,--the elephant, for example; they are vegetarians; they live on a pure diet,--that is the reason they live to be so old . You never find a dog, a cat, or a lion living to be fifty years old--or seventy-five, or a hundred. It is the elephant that lives to be a hundred years old. It is the donkey that lives to be fifty or sixty years of age . I think

there is a gentleman here who is acquainted with a donkey fifty years old. Mr. Rich, do you know anything about that donkey?

Mr. Rich: Yes. He died a year ago; he was fifty-three years old.

Dr. Kellogg: It seems this donkey has had a funeral, and that when he was buried he was 53 years of age. Now notice: it was not a dog, a cat, nor any other carnivorous animal, but a vegetarian donkey that lived to this advanced age.

Now the reason why the non-flesh-eating animal is longer lived than the flesh-eating animal, is because the non-flesh-eating animal takes a diet which is free from impurities; he takes a diet at first hand. If you and I should go to a second-hand clothing store and buy a garment, we should expect to get with it ^{something} that was perhaps not very agreeable; we should expect to find more or less impurities, --dirt, etc. Now, if, instead of doing this, we go directly to the manufacturer of the cloth and buy the cloth at first hand and have it made up into a new, fresh garment, or if we buy our clothing new at a ready-made clothing store, or get it from the tailor who makes the article, you will have it pure and clean, and be satisfied. But, in our diet, we are perfectly content to take the corn that the hog has appropriated to his own use and done what he liked with it for some six months or so; we take it at second hand, and make our bones, muscles, blood and brains out of this material. Now is not this a very poor selection that we make? We take the food that the hog has ^{eaten}, -- we take it at second hand, and with the impurities of the animal. Now compare a dog's breath with a lamb's breath, if you like. The lamb can caper about the parlor without leaving any bad effluvia, but if a dog lies down on the sofa, that sofa must be

disinfected before the smell of dog can be removed. Put your hand on the dog, and your hand smells of dog. You can touch a doe, a fawn, or a rabbit without getting contaminated in that way. Compare, if you please, the smell and the taste of a dog, and mutton. Nobody wants to eat dog chop, or dog steak. If you were at a hotel, and the waiter should come into the dining-room and bring you a piece of dog steak, you would ask him to carry it away. Why? Because the dog has a strong and disgusting odor and flavor. But mutton has a pleasant flavor; even the flavor of horse is not unpleasant. I once visited a ^{horse} meat-market in Paris where they had horse steak for sale. There was "Primary"--first class horse steak, second class horse, and medium. I inquired if horse flesh was eaten much in Paris, and the gentleman of whom I inquired said "No." I asked him why, and he said, "Because it is so sweet; it has not a strong flavor, but it is too sweet." If a physiologist wants a good supply of muscle sugar, he always takes the muscles of a horse, because it is the sweetest of any animal that lives. It is too sweet to be eaten; it is so sweet that they object to it as an article of food, in Paris.

But this is not the case with a carnivorous animal. The flesh of a carnivorous animal has a strong flavor. I asked a gentleman who had been a butcher, if this was not the case, and he said, "Yes, that is so." Said he, "I used to be a butcher, and I could tell when other butchers had been throwing out dead calves to their hogs, because the flesh of those hogs had a bad flavor, and there wouldn't anybody eat it. When a hog eats flesh, it gives it a bad flavor." The same experiment has been tried with cows. On the island of Nantucket they broke through the snow, and they were so hungry that they ate the fish skins that lay upon the shore, and it is said that this contaminated their

flesh . That is the effect of decay. The dog, the lion, and other carnivorous animals live on a second-hand diet. Now, if living on second-hand diet gives the hog a bad flavor, don't you see it would give a man the same flavor? A man's flesh would not be fit to eat, if he lived upon a second-hand diet; and if a man's flesh is in such a condition, his brain must be in the same condition, and hence not in the condition to develop the best kind of thought, and, besides, he is not in a condition to live long.

The flesh of a dead animal contains those very elements which the body is all the time trying to get out of itself . The skin the kidney and the liver are all the time trying to prevent the accumulation of waste matters. So long as the kidneys, liver skin etc., do their work well, we keep young; but when the liver, kidneys, etc. fail to do their work perfectly, then we begin to grow old. And this fact begins to be manifest: when the sclerotics and the skin begin to get tawny, we are beginning to grow old. If the organs of the body could keep the blood and the skin pure, we could keep young. Now when we are taking in the flesh of animals, we are taking into our bodies the dead matter and the waste matter of another animal in addition to those of our own bodies. That is the reason the tissues of the dog have a bad smell; they have acquired their bad odor from this source.

But there are other things besides diet which tend to keep one young . Another means by which a person can keep young, is by keeping the body agile. Stagnation always means death. Stagnation of water means death *in* the water. Here is a stream of water which comes running down the mountain side, bubbling over the rocks and thrown into a foam, exposed to the air and stirred up continually. That water is always bright and pure and cool. Now let that water get into a hollow and stay there six weeks,

and it is covered with slime, intermingled with filth, and is full of death. The same thing is true of the body. While we keep the body active, we keep it highly vitalized; but when we let it stagnate by sedentary habits, ~~and~~ it gets old very rapidly. Notice the horse that is kept in a state of activity: His perspiration is limpid as water; nothing is left on the horse after the sweat drops off. But you let a horse remain quiet for two or three months, and then take him out and exercise him and make him perspire, and his hair is covered over with a white, pasty tarry-like substance with a strong, disagreeable odor. How many of you have noticed this? Hands up! Now this perspiration is the extract of horse, and is an indication of the condition of the tissues. When the horse is active, the perspiration is an indication of the purity of the tissues; and in the other horse, the tarry material left behind shows ~~is~~ just what an impure condition there is in his tissues. The same thing is true of man. The same condition in which we find the active horse is true of the active laboring man, while he keeps his clothes and his skin clean. There is nothing unsavory about him. But the reverse is true of the sedentary man. It is no arbitrary mandate of the Creator, that man should earn his bread by the sweat of his brow. If he dodges the sweating and sits down in a corner and does not engage in any kind of hard work,--no sort of vigorous work--he suffers the penalty. His body is like a stagnant pool; it is full of excretory matter; it is full of impurities, and it loses its transparency. The eye becomes dingy and dull; he gets a bad coat on his tongue, and a bitter taste. He thinks this bad taste is simply in his mouth, and on his tongue, but it means more than that; his muscles and his whole being are contaminated

with that bitter taste which should have been excreted through his skin, liver, and lungs, and it has not done that, because there has not been sufficient vigor in his body. Now that man is growing old very rapidly.

Exercise keeps a man from being old. I have told you that the arteries grow smaller as a man advances in years. Now suppose these arteries are constantly stretched and filled with blood; they will keep their size. An artery that was thus stretched and filled would not contract so quickly as it would if it were never stretched. If I should pull my arm up in this way and leave it so, it would after a while get so that I could not help myself with it, and I couldn't straighten it out; I would have to have others straighten it out. It is so with the arteries and the muscles, and these arteries of the body will contract and get smaller and smaller and smaller if I don't do anything to exercise them and develop them.

Now it is a condition that is essential to health, that the whole body shall be used; that the arteries shall all be distended with blood,--filled to their utmost capacity now and then in order to keep them active; and if we don't do this, they will shrivel up. The same is true of the muscles, veins and arteries. If they are not frequently exercised so as to fill them with blood and swell them out to their full capacity, they shrivel away, and become puny, feeble and relaxed. But if we exercise them every day, so as to thoroughly fill them with blood, they become vigorous and active, and this tends to keep us from growing old. The same is true of the bones, brains, etc. Exercise is necessary, by which we can set the heart going, and fill the blood vessels full of blood, distend the arteries and antagonize the

shriveling process by which the body is made to grow old .

So these two things, diet and exercise, are the most essential things by which we keep young. A good form of exercise is bending over like this. (Illustrating.) An old man cannot get over any nearer to the floor than this. (Illustrating.) Why? His back is stiff. And why is his back stiff? Because it has not been kept limber by exercise. Now this stiffness of the back means a great deal; it means that the abdominal muscles are weak. They don't hold up the abdominal organs, so the stomach and the bowels and the liver and the kidneys all drop down or get out of place. And that is all because of the fact that the back having got stiff, there is no use of the abdominal muscles, because the abdominal muscles antagonize the back. If the back-bone is rigid, like a staff, ^{the muscles} ~~it~~ cannot hold up the spine as ^{they} ~~it~~ should,-- as a string holds a bow, and so they become relaxed and weak and allow the internal organs to drop out of place. So that, if a person wants to live long,--if he wants to live into the eighties or nineties, if you please--he must cultivate youth and health, and keep cultivating youth and health all his lifetime .

There is another thing which it is important for a person to do, if he wants to keep young, and that is, to avoid undue and unnecessary expenditures of vitality. The majority of persons think they are possessed of an inexhaustible fund of vitality. Such a person thinks he has nothing to do but to draw upon his capital, or "pond," so to speak, and he will have no trouble in getting his checks cashed; that he will always have a supply left, no matter how great his drafts may be. Now that is just about as sensible as it would be for one person to say to another man, "I have got an inexhaustible amount of money in the bank,"

although he has for a long time been been drawing upon that fund. All he knows about it is, that he has presented his checks and drawn his cash. He don't know but his funds in the bank are already exhausted, and that the next check that he presents will be dishonored. A man who has been for a long time in the habit of using tobacco says, "I smoke, and it don't hurt me; I wouldn't smoke if it hurt me." "How do you know it don't hurt you?" "Because I smoke, and I don't feel any worse after it ." But you don't know, from your feelings, whether smoking hurts you or not . (Illustrating by diagram.) We will say that this line divides health from disease. Here is high health away up here, and here is death down here . A man starts out with full health--with his "pond" full,--like a pond full of water. He is like a pond full of water which runs a water-wheel. Some one comes along and raises the flood-gates and the water runs over the dam; the water is running out of the pond; the man is losing water from his pond, and you tell him so, but he says, "I guess not. there is nothing the trouble with the wheel, it keeps turning a l right," and, although his pond is getting shallower and shallower all the time, he don't notice it because his wheel turns. He had water enough to run his wheel twenty years if there had no waste, but now it is running over the dam. His wheel turns all right for one or two years,--or even three years; but at the end of three years, his wheel stops, because the water in his pond for seventeen years has run out. Now it is like this (referring to diagram) A man starts here and keeps running down nearer and nearer to the level of disease. He is all the while going down. By and by he gets down here (near the dividing line). He still

feels all right. He says tobacco don't hurt him; whisky don't hurt him; robbing himself of sleep don't hurt him; he doesn't feel any inconvenience, and so he goes on, right up to this point. He has got where just one "more "square meal" is going to bring him down here; one more "Christmas dinner " is going to bring him down here. The next time he takes a Christmas or New-Years dinner, he sends for a doctor. When he was up here, his Christmas or New Years dinners didn't seem to do him any harm, but they were drawing upon his reserve force, and he didn't know it,--and he don't know it until he gets down to the level of disease. The next time he indulges in this way, he will suffer; and the next time he indulges, he will suffer worse, and the next time, still worse . So he keeps going down until he looks into the yawning caverns of death. Then he packs his trunk and comes to the Sanitarium . (Laughter.) He then wants to be carried up into health in a week, and then go home and do it all over again. And as soon as we get him started in the direction of health and getting him to feeling better, he says, "Doctor, why don't I get well faster?" He don't stop to think that his whole great fund of strength which he had while in health and which he had to operate with is all gone, and that he can now simply do a little penny business because his capital is gone,--his vital force and power is gone. Up here he had a 100-horse-power with which to do his work, and now he has to do it with a wheel-barrow. Ten years ago he had splendid digestion, splendid liver,-- all his internal organs were doing their work grandly, but now they are used up; his digestion is miserable. Examine his stomach fluid and you will that it is not as good in quality nor as abundant in quantity as it ought to be. Examine the secretions

of the body and you will find that the kidney and the liver are not doing their work properly. Examine the blood, and you will find seven or eight percent hæmoglobin where there should be fourteen . The man is every way defective, and yet he wonders that he don't get well any faster. He is like a passenger on a ship after a tremendous storm; he inquires of the captain,-- "Captain, why don't this ship sail faster?" when the storm has torn up all the sails. It don't make any difference how large the masts are, or how ponderous the ship is, he must have splendid sails and a fair wind, if he would sail rapidly. Now it is the business of the doctor to spread the sails and raise the wind ,--and the man himself must have some wind, or else it is a slow process.

Now we have got the man up here to the level of health again. Now, he says, "Doctor, I want to go home." But he is not well yet; he is neither sick nor well. He is in statu quo . There is nothing the matter with him, he has no symptoms of disease from day to day and so he says, "Why can't I go home?" The reason why he should not go home is, because it is not safe for him to do, because here he has a hundred props, a dozen doctors , etc., holding him up. He is like a building being raised out of the mud with jack-screws. We give him a turn every day,--and now he proposes to have his props taken away, and he wonders why he wouldn't do just as well without them as before. He would go right down into the mud, you see. Now in order to get on safe ground, he must retain these helps until he gets above this low level of health, and get where he has some reserve capital. May be we can accomplish that, and may be we can't. We sometimes have to be satisfied with getting him only a little ways back from the

grave, he will have a little more comfortable time in his life. Now if, instead of letting himself get into that condition, he would begin to cultivate health from earliest childhood, and if his parents would cultivate health for him, he will not be likely to get into this condition. He should, when young, cultivate his lung capacity by keeping his chest full; cultivate skin activity by cool morning baths, take one every day, going out doors, cultivating muscular activity, and heart activity. The only to make the heart strong is to use it, by exercise making it do active work. If one will do that, there is not one out of forty that should not live a hundred years. But, instead of that, as a rule, we deliberately cultivate disease,--we make ourselves sick. When cold weather comes, we shut ourselves up, making the windows and windows tight by the use of lising and weather strips, plug up the keyholes with cotton, and effectually barricade ourselves from fresh air, while the great volume of God's fresh air is moaning on the outside as if anxious to get in and bring us a resurrection from our half dead condition. If we go out, we shut the door as quickly as possible, and when we come in, we barricade the door again as quick as they can, and then keep ourselves barricaded during cold weather. No wonder we keep sick. A South American Indian or a monk would die in six months in that way. We are not throwing poisons as we should, in this way, so they accumulate in the system, and no wonder we are sick.

We are also cultivating disease at the dinner-table. One old doctor has said "Most people dig their graves with their teeth. It was rather a rude expression, but it told the truth. Socrates said that a man who did certain things --who dissipated in any after he was of a certain age --threw a spade-full of earth upon

his coffin every time he did it. So the majority of people are doing things that are digging their graves, and bringing themselves nearer the end every day; they are thus cutting off their own lives, really committing suicide. We die violent deaths, and not natural deaths. If we lived in a natural way, we would grow old symmetrically--all together; our brains, bones, nerves, muscles, heart, liver and stomach would grow old alike, until by and by we would all go to pieces like "the deacon's one-hoss shay,"--like the old lady I told you about, who simply expired. There is not a person out of a thousand who dies in that way.

Now, is life worth living? Some one says, "That depends upon the liver." Well, in the way the average man lives, I don't think it is hardly worth while to live a hundred years; but if we would live right, it would be worth while to live a thousand years. But we "live at a poor dying rate," as the poet says. How many people are content to go through life living in the most wretched sort of way,--with their brains obscured, with headaches; perhaps they can scarcely think; with their minds so dull and stupid that they can hardly appreciate anything; feeling as though they had a vice hold of the back of their necks; feeling as though there was an incubus brooding over them; feeling as though there was something dreadful going to happen to them, when there is nothing in the wind at all. People often complain of aches and pains which grow out of a morbid condition, and living in this morbid way. Instead of enjoying life, most people barely cling to life; they don't want to die; they want to live, but their life is so wretched and miserable that it is hardly worth while for them to live.

That is not the way to live. If we would cultivate health as we might, we would get up in the morning feeling full of

energy and vim; feeling as if it was worth while to live; we have got to have so much of this vitality enter our bodies that we feel as though we could not keep still; one should feel as though he would like to spring into the air; he should feel as though his muscles were like steel springs, and he should feel like dancing along through the world, so to speak. On the contrary, one's nerves sometimes feel so sensitive that they ^{feel} like a lady who said her nerves seemed to stick into the air a foot all around her. That is not the way to live. We should cultivate more joy, vigor, and health in living, that we may make it worth while to live. But most people think it is not worth while to try to live in that way, because, in doing so, one must deny himself the gratification of perverted appetites. He must save vital energy, not throw it away. He must save his energy and strength,--not throwing it away, but saving it for emergencies and useful expenditures.

There is another thing that I must speak of, that one must observe, if he wishes to live long, and that is, good nature. The man who lives long is a good natured man. The man who always lives the longest out of a given number of people, is a woman.

(Laughter.) We use the word "man" in a generic sense, sometimes. If you take a million of people and follow them up through life, and you will find the longest lived man among them is a woman. I suppose it is because they are good-natured and cheerful, and look on the bright side. It is really a fact that the last person in a million who is alive is always a woman.

And yet, perhaps, women are exposed to more physical perils than men; they are subjected to more hardships which tax their constitution than men are. Good nature certainly has much to do

with keeping people alive, even under the most forlorn circumstances. Women have lived under conditions in which it would seem impossible for a human being to survive, because of their hope and good nature and their determination to make the best of things as they passed along. How many women have gone through conditions in which a man would die,--conditions which they have found in their domestic lives, looking after their families, the wants of the children, their clothing, food, etc. They have to keep good-natured under all these trials, and they have to keep their husbands good-natured besides, while arranging everything about the home and keeping the household in proper relations with its neighbors--the mother has to look after these things. She must do this, and sometimes does it while struggling with disease under which a man would die; but the woman manages to do these things, because she manages to keep good-natured. Good-nature will do a great deal towards the cure of patients. It often has more to do with the cure of patients than anything else. One doctor used to cure his patients by telling them ludicrous stories and laughing with his patients. Perhaps you have heard of the patient who was relieved of a terrible abscess. He was just at the point of death, and had been given up to die, when he saw a monkey playing a trick on the cat, and it was such a cute thing that he laughed very heartily, and the effort of laughing broke the abscess and the man's life was saved by a little good-nature, or mirth. (Repeating story of the insane man who was cured by laughing.) There is certainly great virtue in good cheer,--good-nature. The man who cultivates a pessimistic state of mind, who looks on the dark side, and sees foes and danger, and nothing but trouble,--that sort of a man is sure to

become a dyspeptic. His liver becomes disordered; his whole body gets into a state of disorder. Good nature, somehow, puts one in harmony in every part; it puts the whole body into harmonious relations, one part of the body with another. But when ^{one} is habitually surly and sour and downcast, his digestion is disturbed, and he is likely to become jaundiced, for there is a connection between anger and jaundice--and he gets bilious.. Sometimes people have become diseased and jaundiced with sudden rage, and sometimes ^{has} gotten a stroke of apoplexy and the heart has ceased to beat. (Repeating story of Dr. John Hunter.) That ~~same~~ thing has happened more than once,--that anger has had such a paralyzing effect upon the whole body, that a man has died under the influence of it, and these depressing emotions all have that depressing tendency. I have seen people linger along from month to month under the influence of disease, and they were diseased because they were in a miserable state of mind over imaginary illness and the only ^{way} to do, is to wheedle them out of their imaginary afflictions and their chronic discontents.. I told a lady the other day that I thought the trouble with her was, that she was suffering from chronic discontent, and that so long she remained in that state, her stomach and liver would not work well, and that if she got out of that ^{state} ~~ste~~ of mind, she would get well.

Now, good cheer, good-nature, and a kindly feeling toward everybody has the reverse effect; it is a real tonic,--it is a vitalizing tonic. So I urge you, my friends, if you want to live a hundred years, to be good natured. If you don't feel good-natured and happy, go to work and cultivate happiness and good cheer.--And especially in a place like this, how important it is that everybody should cultivate good cheer. Suppose some one

should come into this room with a long and solemn face and begin to tell over their physical troubles, it would make everybody's face long in this room,--unless it were so ludicrous as to cause a smile--but when a person comes to us with that long, solemn face, and tells us how bad they feel; that they ~~don't~~ sleep well; how many specks there are before their eyes; how many bad symptoms they have, and how much pain they have here and there; that they are not getting well; everything is out of joint; they don't like their breakfast, ~~ditn't~~ like their bath this morning. When people go around in this way, it is like throwing cold water on our efforts, and we begin to feel in the same sort of way, and we, too, begin to grumble at things that we wouldn't have thought of speaking about before. It is in this way that patients get discontented. Some one calls our attention to something they think isn't just right, and we partake of the same spirit of discontent. I remember two of the most unhappy persons that I ever encountered. It was a man and his wife who had been to visit a phrenologist. *They had previously lived happily together.* The phrenologist after examining their heads told them they were not adapted to one another; that they never ought to have been married; that the woman, for instance, ought to have had a taller husband, and the husband ought to have had a plumper wife, and that they ought to have had entirely different mates. They went back home, and made themselves as wretched as could be, and they came to see me after a while, and I told them the thing they had better do, was to get some one to shoot that phrenologist,--if they could; that a man who went about the country telling such nonsense as that, wasn't to live, and that he was guilty of producing moral murders,--really killing people. ..

Now you see, my friends, if one wants to be well, if one wants to be strong, ^{that it is necessary for him} to cultivate health and happiness. Suppose some one should come in here with sunshine in his countenance,-- with a bright eye and a smile on his face--the corners of his mouth being drawn up, instead of down: the effect would be the same as if this room were full of mirrors; each mirror would reflect the light of the other mirrors, and this room would ~~not be~~ merely a room with a hundred lights, but a room with a thousand lights, and you could see a line of lights everywhere, so far as the reflections could be distinguished. That is what would happen if a person should come in here with sunshine in his face; it would be reflected in the face of every person present. Then these rays of sunshine and good cheer get into our hearts and are reflected back and forth, until everybody is brightened up by it.

And that is what ought to be in a place like this. Instead of talking about our ailments, our griefs and our troubles and diseases,--the last of all things that should be talked about among patients--instead of talking about these things, let us talk about getting well. Suppose now we taboo all other subjects and talk about living a hundred years,--not talking about how sick we are, and about dying soon, but about how fast we are getting well; and if we are not getting well very fast, let us talk about how fast we expect to get well, and of the faith and hope and confidence we have in being ultimately restored to health. Now if we don't feel in this way, we ought to go home. People should not stay here for the mere purpose of paying their bills. If there is any one who does not think this is the right place for him, he ought not to be here. We must have faith, hope and confidence in the means that are being used for our restoration to health, and this mental condition will be a great aid

in the work of restoration to health and happiness.