Perhaps intended as memo for a lecture.
M

2-17-41

NATURE A FALSE GOD

Ask a man what makes a tree grow. "Why," he says, "Nature."

If you tear off a bit of bark from a tree and new bark grows on, what makes that? That is something that has not been going on for a long time in the tree. When a tree loses a part of its coat, it has to have a bark maker to put it on. It does not grow on itself.

You look at a beautiful sunset and say, "Oh, what beauty in the sky. What a lovely sunset it is." Who makes that sunset? There has to be an artist behind that sunset. Who is the artist behind the scenes that is painting all the beauties in nature, tints all the flowers and colors all the beautiful things in the world? Is it Nature? Is it Nature, a blind force, that is doing that?

We look into the human body and see all the marvelous machinery in it. What is behind all that?

When you see a wonderful machine that is knitting, another machine that is sewing, another machine that is weaving, and you say, "What wonderful machines those are that can do all those things" and you find even a machine that is talking, and you say, "What a wonderful machine that is that can talk", and a robot that can ring a bell, a robot that will watch your home and if a robber comes, even in the dark, will know of his approach and can warn you that there is a robber coming although there is no eye there, But here is something that can see the robber when he is approaching even though there is no light present. Here is a detective sharper than any human

detective could be under the circumstances that advises you that the robber is coming.

What is behind that? Is it blind Nature? Nature is blind. Is it an automatic nature? Is it a material force that is carrying on this wonderful work?

What happens if the steam is turned off from all these wonderful engines? What will happen to them? They will stop at once? It is not the machine that does it; it is the steam that is the power behind it.

When you come to study the steam, what is behind the steam? Behind the steam is fire. Where did the coal come from that makes the fire? Where is the power that regulates the heat that is behind the fire?

And so with all the beauties of the sky, there is an artist behind those things, and what is behind the artist? Where is that artist. These are all wonderful things.

Suppose there comes a storm and the picture is all brushed away. What is behind that storm, that terrible hurricane, the power in a tidal wave that drives the tidal wave over the land and tears away mountains even, the earthquake that destroys a mountain, a volcano that sends up earth to make an island in the sea? Where does that marvelous power come from?

Where is the power behind all the waterfalls in the world that drives the wheels? What is behind that?

What is the power that raises the water up in the sky before it goes back to the ocean from the mountains, and comes running down again, and turns the wheels of factories?

Where does the power of Niagara come from that turns those great motors that light up such a large portion of Canada and Michigan, and furnishes power for so many factories and various other enterprises? Is it Nature that makes that power? But what is Nature? What is behind Nature? There must be a power behind it all?

What carries on the marvelous work of the body, more marvelous than any machine any man ever made, of digesting food and converting living vegetable structure into living human structure; or taking dead food that lies upon our table lifeless, or ~~rather~~ at least inactive, ~~taking that food~~ and carrying it through the process of digestion? What is behind digestion? Where is the chemist that can convert that unconscious vegetable food into living human food, into brain, into human activity, into something that is eaten today and walking around tomorrow and talking? Where is the chemist that can do that?

What keeps the heart beating?

Etc.

b

1-16-42

MY SEARCH FOR HEALTH

Having devoted ~~almost~~ practically my entire life to an earnest search for the all-healing spring of correct habits of living, and having lived 30 years more than the average life period of 60 years for males in the United States, notwithstanding a poor start and many highly adverse circumstances, I think it worth while to give to the readers of Good Health and others who may be interested some brief account of my argosy and a summary of my findings. This seems particularly proper at the present time as this is the seventieth year of my service as editor and manager of this magazine, Good Health, the only survivor of a considerable number of health monthlies which began to make their appearance a century ago.

I was born a rather puny infant on a pioneer farm in _____ county, Michigan, where my father settled in 1834 and suffered from lack of iodine in the soil, as did the sheep, which prevented sheep raising, and rickets from lack of sunshine.

My parents moved to town when I was one year old, and I have suffered the disadvantages of an indoor sedentary life ever since.

It was fortunate indeed that I became interested in health at an early age, for otherwise my career would have terminated not far from its beginning, for I was born 90 years ago on a pioneer farm in eastern Michigan, then the western border of civilization, a

few miles from an Indian settlement. My parents were not long lived;my father died at 74 and my mother at 69, worn out by pioneer hardships.

Michigan was not a place for a good start in life. Sunlight was so scarce that rickets in children was almost universal because of the lack of sunshine, and the same clouds that shut away the ultra-violet light brought the rains which robbed the soil of its iodine which the youngsters needed, and without which farmers could not raise sheep until they discovered how to get the iodine by getting the sheep from New York instead of Saginaw.

At 10 I began working for my board and lodging 10 hours a day in my father's factory. At 12 I became a printer, at 16 a school teacher, and at 20, with no intention of practicing medicine, I entered medical school because of my interest in physiology and biology, intending to devote my life to teaching, having a great aversion to practical medicine. I graduated at 23. By the next year, in spite of my resolution and inclination to the contrary, I began to practice medicine.

Soon after entering the printing office, I had come in contact with one of the most remarkable, though little known, books that have appeared in this country, "Lectures on the Science of Human Life" by Sylvester Graham, a learned man, a college

graduate and professor who had made a profound study of physiology, having come in contact with health enthusiasts who had come to this country from England about 1818, and made a careful inquiry into the influence of habits upon health, and being a brilliant lecturer and basing his arguments upon strictly scientific grounds acquired before his death in 1851, a large following.

The most important of ~~his teachings~~ which was ~~perhaps~~, were the adoption of a natural dietary, that is, that indicated by the zoölogical classification of Cuvier, the great French naturalist, who placed man at the head of the zoölogical family of primates along with the chimpanzee, the orang-utan, the gibbon, and the later discovered gorilla and other low protein feeders whose diet Cuvier described as fruits, grains, nuts, tender shoots, and succulent roots. Cuvier's classification has never been questioned and stands today as well established as ever, and although practically followed by fully nine-tenths of the world's inhabitants and recognized as thoroughly scientific, is still in some countries highly unpopular.

Over Graham was much persecuted but persevered until his premature death from tuberculosis. Graham was also the originator and enthusiastic advocate of the use of whole grain preparations. Whole grain bread became known throughout the world as graham bread, and his followers known as Grahamites

A few years after the death of Graham, indirectly as the result of the spread of his doctrines, a small group of health reformers started in 1866 a reform center in Battle Creek, of which my father was treasurer and with which I became associated at the age of 14 by serving as his deputy, in looking after the institution's finances, and after beginning the study of medicine, became editor and manager of the monthly paper The Health Reformer, the mouthpiece of the work. A year after graduating I yielded to a second urgent appeal to take charge of the small institution for one year, still planning to devote my life to study, research and teaching.

Once started, the work which Sylvester Graham initiated and similar efforts, welling up from all parts of the world together formed one great stream of progress which today is bursting out of new discoveries of fundamental facts in experimental nutrition and other research laboratories in all parts of the civilized world.

The reading of Graham's book and especially his quotations from Cuvier convinced me that there was a natural way of living for men as well as for other members of the animal kingdom, and for dependable guidance in nutrition we should search the great book of nature and probe the secrets of the laboratory rather than study customs and the cookbook. ~~I got this idea from the study of Froebel's kindergarten methods when at 15 teaching a group of~~

use
+ over

neighborhood children. The application of the same idea to education enabled me to pass at normal school methods of teaching algebra without having studied the subject with the teacher.

The discovery that nature was wise was a great joy to me. The impression I had been given in my early education was that nature and the devil were very intimate and that in the study of nature one must be continually on his guard lest he should be led into error by some scientific sophistry. Although I did not at that time realize as I do at the present that the term nature as now generally used spelled with a capital is a false god whose worship blinds the minds even of Christian people to the fact that, as the learned apostle Paul told the Athenians, God "is nigh to every one of us, for in Him we live and move and have our being."

No one is so well prepared to appreciate Paul's great sermon on Mars Hill as the great physiologists when studying the human body and recognizing what Professor Cannon of Harvard University called the "wisdom of the body," - a wisdom which becomes more and more complex and fathomless as the microscope peers deeper and deeper into the secrets of matter until the molecules themselves at last are seen. True science is but a revelation of the Creative Intelligence and is clothed with the sanctity of infinity and rightly viewed holds the key to spiritual harmony and peace. Making a definite distinction between real

facts and subtle theories and hypotheses and regarding all truth as one great whole and the infinite source of all, brings to one a satisfying sense of security which connotes peace of mind and dissipates uncertainty and apprehension, and so promotes optimism and the good health associated with it.

After forming the acquaintance of Graham's wonderful treatise on "The Science of Life," which reads like an up-to-date book on current health philosophy, I started on a life of research which I might perpetually follow with pleasure and profit, which I have since been doing.

Almost immediately after I began the study of medicine, I ran across one of the volumes of Liebig's early works on agricultural chemistry. This work I read and studied with great profit and also the work which I soon discovered by his rival, the eminent Professor _____.

And when not long after the first agricultural experiment station and their research laboratories made their appearance, and the periodical reports of the experiment stations established in connection with agricultural colleges began to appear, I found a rich source of up-to-date information in matters related to nutrition from which I constantly gleaned ideas and facts, ~~of which~~ and I made constant use of them.

Beginning my work at Battle Creek as a physician, I resolved at the very start that I would

make physiology the basis of my practice and that I would have as little as possible to do with empiricism, which at that time constituted almost the whole body of what was called the art of medicine. There was then little of what could be called science in the therapeutic practices of medicine to be found in any one of the various schools or sects engaged in caring for the sick.

In attending the Bellevue Hospital Medical College, I went strongly against the urgent advice of James White, who was the publisher of Good Health and chairman of the board of directors of the Health Reform Institute, as the little institution was called. He had the impression that so long as nature had to do the healing work anyway, it was quite unnecessary for the doctor to worry about so much minute detail, and that nature must look after him anyway. But, although I was a confirmed skeptic in relation to a large part of the materia medica that was taught, I was none the less anxious to become conversant with the entire body of doctrines and philosophy held by the strongest and most highly cultured body of medical men then recognized as physicians.

I never ceased to be grateful that I had the honor and the privilege of forming the acquaintance of those eminent lovers of truth, Professors

Austin Flint and E. G. Janeway. Both were open- and liberal-minded men and so progressive in spirit and liberal in practice that they were often known as nihilists in therapeutics. They both showed a strong leaning toward physiotherapy, which had been practiced in my father's family for a score of years or more, and into which Graham's ideas were beginning to creep even during my early boyhood. One of my uncles had attended Graham's lectures and had become a meat abstainer and a strict abstainer from tea and coffee, tobacco and alcohol; and my three older brothers had attended schools at Oberlin where Father Shipeard, founder of Oberlin, had introduced it after having become acquainted with Graham when on a visit to New York to collect funds for promoting his project. My parents were strong protestants against bleeding, purging, and various other of the "old school" methods of jugulating disease, against which a strong and growing prejudice developed after the death of George Washington, following several drastic blood lettings to relieve a severe throat affection.

I remember very well how violently I shivered when at the age of 10, I was wrapped in a cold wet sheet pack to "bring out the eruption" in an attack of measles. I shall never forget the crude shower bath with its half barrel tank arranged over a pan with

a perforated bottom, through which the cold water from a deep well poured in frigid streams on my body until the tank was empty, because the door to the little chamber in which I was confined stuck fast so I could not escape, and no one came to my relief until the tank was empty.

Hydrotherapy in those days was known as as the "cold water cure." ~~No one had yet dreamed of fomentations. Slices of pork covered with paper were spread on the throat.~~

As a private student with Professors Flint and Janeway, who were associated in their work, I had an opportunity to profit greatly by close contact with these two able men who stood at the very top of the profession of their day. More than once when Flint presented evidence of the superiority of non-medicinal methods of treatment in curing cases in which drug remedies had failed, I heard Professor Jimmy Wood reply in most contemptuous, almost insulting, tones. It was rare indeed in those days to hear anyone speak courageously in behalf of the new and milder methods of treatment which were just beginning to receive the consideration of scientific men. I and another young man were the only heretics in old Bellevue, with its great student body of more than 600, and we never dared converse in public.

Doctors Flint and Janeway were at that time

regarded as the ablest diagnosticians in the United States. Austin Flint was the great expert in heart and lung troubles and in internal medicine Janeway was unapproached by any other specialist. Every day at noon I and four or five other special students reported to a large room in the old hospital where we found brought together a dozen or more of the most interesting and important cases which each of us was required to examine and report upon. This drill was of immense help to us as diagnosis, especially by the aid of instruments, was only just being introduced at that time.

When I came to Battle Creek I brought with me the first improved stethoscope and the first high powered microscope that had ever been in current use at Battle Creek. My New York training and experience led me to establish the first laboratory for bio-chemical studies in connection with the Sanitarium.

The character of my diploma as a graduate of Bellevue College and my training under Doctors Flint and Janeway made it possible for me after returning to Michigan, to obtain membership in the state medical society and later the county medical society, notwithstanding the fact that I was open to suspicion as a heretic and becoming superintendent of the institution, which had not yet had time for transformation into the better organized, scientific establishment of

broader scope into which I hoped it might be developed.

Graham extended his lectures on health and temperance to all parts of the United States and appealed to his hearers so eloquently and also wrote so many such convincing books and pamphlets that he won great numbers of followers and started reforms which developed mightily after his death and continued to develop even more rapidly than before in recent years, and his work was exceedingly fruitful. Through the influence of other leaders who accepted his teachings, his reforms were accepted and made basic principles of organization for numerous important bodies, among whom were the Mormons, whose adherence to his principles had won for them in an announcement by the League of Nations, that they had the lowest death rate of any large group of people in the world. The Shakers, The Brook Farm experiment, and many other organizations ~~have~~ attached especial importance to his teachings and greatly profited by them.

Dr. Flint had been a student of the famous _____ who invented the stethoscope and perfected physical methods for studying the heart and the lungs and had great influence and his work on practice was a great step of progress in medical reform in America.

Dr. Flint was also a friend of the famous Dr. Bigelow who wrote, "The Paradise of Doctors," a blistering sarcasm to expose the folly of overlooking the fact that, as the great German medical philosopher Dietl said, "Nature creates and maintains; therefore she must be able to heal."

Dr. Oliver Wendell Holmes, also a friend of Dr. Bigelow, also ridiculed the irritational drug therapy of that period by a poem in the sixties read before the Massachusetts Medical Society, entitled "Rip Van Winkle, M.D.," which his friend Dr. Stephen told me subjected him to so much severe criticism that he would no doubt have been turned out of the medical society if it had not been for the strong position he held in Harvard University as professor of anatomy and the repute in which he stood as the discoverer of the cause of the terrible scourge of that time, puerperal fever.

While disturbance of any of the acts which are concerned in normal peristalsis and colon functioning may be a contributing cause of constipation, there seems to be no room for doubt that the leading proximal cause is bacterial digestion and B. coli infection resulting therefrom.

The proximal cause of this condition is a disturbance of the normal proportions of digestible protein and available carbohydrate which can be used as a source of energy by the normal bacteria of the intestine, with the maintenance of an acid condition of the intestinal tract by the production of an acid reaction of the intestinal contents throughout the whole alimentary tract.

A typical normal human dietary is that of a nursing infant and a typical human flora is found in the stool of a nursing infant.

The diet consists of protein, carbohydrates and fats with a very great preponderance of carbohydrates.

The intestinal flora is of course chiefly determined by the dietary, which as found in the stool of a normal nursing infant is aciduric, consisting in a typical stool of about 10 to 15 percent B. coli and 80 to 85 percent of the L. acidophilus group. The

characteristics of such a stool are as follows: pH odor, etc.

So long as the infant continues to receive all its nourishment from a healthy mother so that the above conditions are undisturbed, the bowels are regular, moving generally after each feeding, or at least three or four times a day. Under these conditions only normal gastrointestinal digestion occurs. The alimentary tract is acid in reaction throughout its entire length from stomach to colon. Under these conditions there can be no bacterial digestion or putrefaction and no toxic products are found in the stools or the urine because under these normal conditions no toxic substances such as histamine, ammonia, skatol, phenol, pyridin and various malodors and harmful products are produced.

Under these conditions, L. acidophilus being the dominant bacterial resident of the intestinal tract and producing only lactic acid, B. coli is a harmless parasite (Kendall), producing only lactic acid and odorless gases (CO_2 and H).

After the child is weaned and in older children and adults when the food supply no longer consists exclusively of breast milk, the dietary becomes highly variable in the proportions of the proteins and carbohydrates eaten as well as in the availability of the carbohydrates. One of the first effects of this change

in the character of the diet is an increase in the proportion of B. coli and a decreased number of L. acidophilus with a diminished amount of lactic acid present. More CO_2 is produced and there is increased intestinal distention. As the supply of available carbohydrate decreases, the L. acidophilus and its congeners, bifidus and exilis, may disappear entirely or nearly so, so the flora consists almost entirely of B. coli. The flora may still remain aciduric (at a lower level, 5 percent or less).

A further drop in carbohydrates may compel B. coli to get its energy from protein. This is the beginning of bacterial digestion with the various toxic substances and offensive gases that pertain to this alkaline digestion, the normal purpose of which is to reduce dead protoplasm of animal and vegetable organisms to a soluble state so that they may return to the soil and serve as nourishment for another cycle of plant and animal life.

As proteolytic activity continues, the mucous membrane is attacked and the irritability induced gives rise to spastic contractions which slow the movement of the fecal mass torward the distal colon and the exit. The result is still further delay and the formation of a vicious circle in increasing stasis and increasing constipation, for which laxatives produce only temporary relief at the expense of increased irritability and greater spasticity and aggravation of

the the constipation which under continued dosing with medicinal laxatives becomes steadily worse and finally the mucous membrane is so badly damaged that acute or chronic colitis results. As Kendall and other bacteriologists point out, appendicitis and various other serious morbid conditions may be induced, such as B. coli infection of the kidneys, renal calculi, cholecystitis and cholangeitis.

The colon consists of the last 5 feet of the 30 foot alimentary canal of the adult human being. It is not an organ of digestion but is a refuse receptacle. The digestive work is performed in the mouth, the stomach and the small intestine. The mouth grinds the food, the stomach softens and dissolves the food, disinfects and sterilizes it, begins the digestion of the proteins of the food, changing their amines into amino acids, thus preparing them for assimilation as material for growth and repair of the brain and nerve cells, nerves, muscles, glands and other of the living working structures of the body.

The major part of the digestive work is done in the small intestine which also absorbs the digested foodstuffs, the amino acids produced by the acid gastric juice, the sugars produced by the diastases and the other products of the enzymes and other digestive agents of the several digestive juices produced in the stomach and intestine.

The colon serves the purpose of a waste receptacle in which the waste and unusuable material is allowed to collect for periodical evacuation, an arrangement which is provided for all the higher animals so that the function of waste disposal might interfere as little as possible with various voluntary activities. The colon receives the food from the small intestine after it has been liquefied by the several digestive processes in the small intestine and the usable portion has been absorbed. The residues are held back by a sphincter muscle on the proximal side of the ileocecal valve until the digested portion has been absorbed and then relaxes, allowing the unusable residues to pass on into the colon through the ileocecal valve, which is so constructed that when normal and intact it closes with the slightest degree of back pressure and efficiently prevents a reflux movement into the small intestine.

In cases of chronic constipation this valve is generally found incompetent, having been broken down and rendered inoperative by the back pressure of accumulated wastes and residues. In very extreme cases the ileocecal valve may be found so badly damaged that it permits a very constant reflux of wastes and putrefying materials into the small intestine. This refuse material is sometimes driven back the whole length of the small intestine, even reaching the duodenum and the stomach.

It is important to note this fact because it

emphasizes the importance of suppressing bacterial digestion or putrefaction in the entire alimentary tract, since when this is not done, the damage produced by abnormal changes in the colon may extend to the whole alimentary tract, and the writer in performing operations upon the intestine has more than once seen from a few inches to several feet of the small intestine packed so full of semi-solid fecal matter as to give them the appearance of a well filled sausage.

It is thus clear that while it is true that comparatively little absorption takes place from the colon itself and a certain amount of protection against colon toxins is afforded by a filtering or poison-destroying activity in the mucosa of the colon, this normal provision for defense of the body is, as a matter of fact, almost wholly inactive in the case of human beings, at least those whose colons are diseased because, according to Dr. James T. Case, an eminent X-ray authority and other specialists in radiology, by far the great majority of adults' colons, possibly 97 percent, are incompetent either as the result of disease or congenital defect. The great frequency with which this defect is present accounts for the nausea sometimes resulting after the use of the enema by which toxic products may be carried from the colon backward into the small intestine where they are rapidly absorbed into the circulation.

Fortunately, incompetency of the ileocecal valve does not always produce the ill results that one might expect because of the reverse peristaltic activity set up in the cecum during active digestion and the passage of material into the colon from the small intestine, the purpose of which is to cause the retention in the cecum of the thin gruel-like food material long enough to promote the absorption of more than half its water content, thus producing an alimentary bolus of such consistency that it may be grasped and retained by the instestine so that its movements may be controled by the body. otherwise its low consistency might cause it to pass rapidly out of the colon as does an enema.

MECHANICS OF DIGESTION

The food, as shown by the X-ray, is carried along the alimentary tract by peristaltic movements which grasp the food and carry it along in a precise and definite manner instead of leaving it to the uncertain control of gravitation. The movement of the food by peristaltic activity is rapid in the upper part of the elimentary tract but much slower in the colon. At the end of four hours from the taking of a meal nearly all the food will be found in the lower part of the small intestine. Two to four hours later the unusable residues of the food will be found in the colon, often in the lower part of the distal colon, within a few feet of the exit. Notwithstanding the rapidity with which the first portion of the food is advanced, the larger

portion of the food of a given meal advances much more slowly so that the major part, usually almost the entire part of a meal, many times the entire meal, may remain in the body 24 hours or longer.

The advancement of food in the colon is usually very slow except when it is carried rapidly forward by the mass movement which occurs during an evacuation and sometimes on other occasions. In general the movement of the mass of detritus in the colon, as shown by careful observations made by the X-ray, is almost imperceptibly slow. This slow movement is believed to be induced by the many times repeated pressures of the diaphragm. When the colon is pressed downward by the depression of the diaphragm in inspiration, especially in the standing position, the pressure of the organ against tense abdominal muscles tends to push the contents forward. Running and active exercises of all sorts tend to increase very definitely this forward movement which undoubtedly accounts for the well known influence of bodily activity in combating constipation.

4-1-42

THE NEW SUGAR

B-Lac or Beta Lactose

History Discovered_____

It remained a laboratory curio until it was produced by Dr. John Harvey Kellogg, Superintendent of the Battle Creek Sanitarium, in the course of researches carried on for some years for the purpose of increasing the solubility and palatability of milk sugar (alpha lactose).

Having accomplished his purpose, which was to make milk sugar palateble, so that his patients would make use of it in quantities sufficient to suppress intestinal putrefaction and other infections, the Doctor did not turn his product over to us. On this account, the remarkable individual qualities, especially its delicate and delicious sweetness and ready solubility, were not fully appreciated until our attention was called to the matter by the U. S. Department of Agriculture, from which we received a small quantity of the pure product which they had isolated and studied. The head chemist of the Dairy Division also called on us and kindly gave us information concerning the product and its chemical and physical properties.

Further experiments under the direction of Dr. Kellogg, who for more than 50 years has used this laboratory in food researches for the benefit of the patients of the Battle Creek Sanitarium, resulted in the discovery of a method by which the new sugar may be produced in large quantities.

When produced in quantities, it is sold at a price not exceeding that usually charged for the ordinary milk sugar.

Properties.--B-Lac is four or five times as soluble as ordinary milk sugar, and is so sweet that it readily takes the place of cane sugar for daily use, and for making lemonade and other sweet beverages prepared for immediate use.

By long standing and the absorption of moisture from the air, the sweetness of the new sugar diminishes, and on this account it should be kept in an air-tight container.

Name.--To distinguish this improved form of lactose from ordinary milk sugar, it is designated by the second letter of the Greek alphabet, and so called Beta Lactose, while milk sugar is known as alpha lactose. B-Lac is simply an abbreviation of Beta Lactose. It was chosen to distinguish this as the original and for some years the only Beta Lactose in use, at first in combination with dextrin in Lacto-Dextrin, and later under its own commercial name, B-Lac.

Properties.--While the chemical composition of the two forms of lactose remains the same, the remarkable change made by recrystallizing at a critical temperature makesBeta Lactose four or five times more soluble than milk sugar.

How it differs from other sugars.

Babies.

Colds.

Wounds.

Obstetrics.

See paper, Biologic Asepsis.

Putrid wounds.

Healing wounds.

QUESTION BOX LECTURE IN THE SANITARIUM DINING ROOM,

JULY 27, 1942

By

Dr. John Harvey Kellogg

QUESTION: Do you approve of steel arches or a slight brace put in shoes for slender, tender feet?

ANSWER: The purpose of the steel arch in the shoe is to support the longitudinal arch of the foot or the instep. This is really a double arch and when the steel arch is in place the muscles which normally support the arch are not active as they should be. The arch is maintained by the contraction of the muscles of the bottom of the foot, the muscles of the sole of the foot. If these muscles are not active, when they become weak the foot drops. The steel arch holds the foot up and gives temporary relief and is a proper thing, but not the only thing to do.

If one does that one must also take special exercise for the foot. The best remedy I know for a foot in which the arch is sensitive or is flattened is the Japanese slipper. The Japanese slipper has no heel. It has no support behind the heel to keep the slipper from slipping off and it can only be kept on by curling the toes up in this way. That tightens the slipper on the foot or the foot in the slipper at the front end of the slipper and keeps it from falling off.

If one has the habit of wearing these slippers, at least at home, the arch will grow stronger. The muscles of the sole of the foot will be strengthened and the whole foot will be made stronger and so the difficulty will be overcome. I have cured a good many

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people of this trouble, flat foot, by having them wear Japanese slippers. It is especially efficient as a means of exercise when one wears the slippers in going up and down stairs, particularly in coming down stairs. As you step one step after the other it is with some difficulty that the slipper is kept on the foot, and with the forward movement to advance to the next step the slipper will be tossed clear out into the room unless you keep the toes curled down.

QUESTION: What causes varicose veins and how can they be cured?

ANSWER: Varicose veins were formerly rather a formidable difficulty. I have many times dissected these veins out from one end of the leg to the other, making very extensive wounds, but after a while we learned to get them out without so much injury to the skin. Now the trouble is cured by simple injection which blocks the vein, compresses it in such a way that the circulation is interrupted and it may be easily cured. It is a harmless, simple and painless method that is very successful so it is not formidable as before.

The condition is the result of disease of the veins. There are little valves in the veins which prevent the backward movement of blood, and if these little valves are destroyed, the blood does not move forward as it should and accumulates in the veins.

I feel perfectly safe in saying to you that if you are suffering from a trouble of this kind it may be readily relieved by a good general surgeon or some specialist. I would recommend you to consult some good general surgeon rather than an advertising specialist.

QUESTION: What causes white spots to appear on the

people of this trouble, flat foot, by having them wear Japanese slippers. It is especially efficient as a means of exercise when one wears the slippers in going up and down stairs, particularly in coming down stairs. As you step one step after the other it is with some difficulty that the slipper is kept on the foot, and with the forward movement to advance to the next step the slipper will be tossed clear out into the room unless you keep the toes curled down.

QUESTION: What causes varicose veins and how can they be cured?

ANSWER: Varicose veins were formerly rather a formidable difficulty. I have many times dissected these veins out from one end of the leg to the other, making very extensive wounds, but after a while we learned to get them out without so much injury to the skin. Now the trouble is cured by simple injection which blocks the vein, compresses it in such a way that the circulation is interrupted and it may be easily cured. It is a harmless, simple and painless method that is very successful so it is not formidable as before.

The condition is the result of disease of the veins. There are little valves in the veins which prevent the backward movement of blood, and if these little valves are destroyed, the blood does not move forward as it should and accumulates in the veins.

I feel perfectly safe in saying to you that if you are suffering from a trouble of this kind it may be readily relieved by a good general surgeon or some specialist. I would recommend you to consult some good general surgeon rather than an advertising specialist.

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QUESTION: Is Battle Creek indicated for a person wishing to reduce weight in a short time?

ANSWER: A reduction of weight is a matter of regulation of the intake and outgo. A freight train traveling down the track in the old days when I was young used to stop at every station to take on a supply of wood. Enormous piles of wood used to be found at every station and the train used to stop at every station to take on a load of wood. Then came coal and now we have oil and very often trains travel a long distance. They stopped rather often to take on fuel, but only once in a great while did they stop for the purpose, sending the engine into the roundhouse for some metal repair.

In our food there are two kinds of fuel, two kinds of supplies, supplies for fuel and supplies for repair. Every mouthful of food we takecontains material for repair and material for fuel. The repair material is needed to restore worn out parts of nerves, muscles and glands, blood corpuscles and brain cells and the active working parts of the body. This is what the repair material is for. Fuel is needed to burn for energy, to maintain heat to keep the body warm and to supply energy for the muscles and the nerves and the glands.

The brain does not require very much material. I remember a good many years ago when Dr. Benedict and his colleagues were making experiments down in Connecticut in metabolic studies to determine the amount of energy used in the body in different ways. The Doctor sent for me to come down there. He wanted to learn the metabolic activity in a man who did not eat meat. I had not been eating meat in those days for 25 years or more and he thought my metabolism must be away down below that of meat eaters, but when he got me there and put me in an

skin and how can one get rid of them?

ANSWER: This is not so easy to get rid of. This condition is due to disease of the trophic nerves of the skin. The nerves that regulate the nutrition of the skin become diseased and this is one of the results. It is a specific disease and not easily cured. I have seen cases, however, that made very considerable improvement in the sunshine. The sun is the best doctor for the skin and I have seen cases in which the spots almost entirely disappeared. I remember the case of a man whose arms and legs and body were almost entirely white. He was a brunet and had rather dark skin naturally, but his skin had large spots that were entirely white, and after about six weeks in the sun every day-- this was mid-summer--small brown spots appeared scattered all over these white spots, little specks about as large as the head of a pin, and these gradually enlarged more and more until by the end of the summer season the white spots had almost entirely disappeared. They were almost entirely covered by the coalescence of the small brown spots which had started as mere specks and finally covered almost the entire surface.

I believe in many cases, perhaps most of these cases, a cure might be effected. I am sure great benefit might be derived from the use of vitamins as well as sunshine. Vitamin A particularly and vitamin B_6 are useful in the development of the skin and in troubles of this sort. If there is putrefaction in the colon it is very important that this should be entirely suppressed. In fact, for all chronic degenerative maladies it is necessary that for recovery the diet should contain all the vitamins and all the food minerals and the diet should be so regulated that putrefaction should be entirely suppressed. There is no reason why it should not be.

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When a doctor is called to see a baby his first effort

is to examine the napkin. The baby's diaper is brought to him and he makes a careful examination. If he finds putrid odors there he knows the baby is ill and he has some idea of what is wrong with it. He makes a study of the case especially with reference to its alimentation, its nutrition, and it is in remedying this condition that the baby is most likely to find relief. It is particularly notable and known as an almost universal fact that if such a baby is put on breast feeding it is almost certain to recover. There is nothing so good for such a case as breast feeding, and why? Because mother's milk is a milk prepared not by Nature but by the God of Nature. We sometimes talk about Nature doing this and Nature doing that, but Nature is a false god of christendom and has been worshipped for some centuries. God himself, the power that made us is the god of Nature and is behind Nature. Nature is nothing but a picture, simply a panorama of the work that is going on under the activity of the great power that upholds all the great worlds we see in the sky and all the activities in nature and this world of ours and in our own life from the beginning of our existence to the end of it.

The same power that made the heart stands by the heart and keeps it going. The heart requires an infinitely powerful and wise and skillful engineer. It is a machine so delicate, so marvelously constructed and controlled and continually adjusting in its movements to the needs of every portion of the body that it needs an infinite engineer, and the same power, as I said before, that made the heart stands right behind it and controls and adjusts every single beat to the particular needs of the body.

The work of this institution is to find out what the all-wise creator is trying to do for the sick man and to help about it in every way we can by removing the cause and doing such things as will

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accelerate the curative process that is going on in the body.

QUESTION: What is the normal blood pressure?

ANSWER: The normal blood pressure differs somewhat with the age, but the really normal blood pressure of an adult should never vary very much from 120. It does not matter what the age is there is no such thing as a normal blood pressure for youth and a normal blood pressure for a person middle aged and a normal blood pressure for a person far advanced in age. Very often we hear a person say, "My blood pressure is 140. That is about right, the doctor tells me, for my age." There is only one blood pressure that is absolutely right and that is the blood pressure in which the body is most perfectly nourished and most perfectly sustained in its activities. "The blood is the life." "The life is in the blood" the Good Book says, and that is scientifically right. "It is the blood that heals" as the great Rokitanski once said. It is the blood that creates in the body, and so every organ in the body, every tissue and every cell needs a constant supply of blood. Pain, as Dr. Chaplin of London used to say, "Is the cry of a hungry nerve for better blood." So whenever there is pain there is something wrong in the circulation, likely to be, in the part or some other part. That is the most likely cause of pain, and the best remedy is to supply more oxygen. A Brooklyn doctor specializing in heart cases some time ago remarked in a discussion before the New York Academy of Medicine, "Angina pectoris is the heart screaming for air"-- screaming for oxygen. Some years ago it was discovered at the Mayos that inhaling pure oxygen is the best remedy for angina pectoris, which is strong confirmation of this idea.

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iron box before breakfast one day and kept me there until after supper at night without breakfast, dinner or supper, and kept me going through various sorts of activity, he found that my metabolism was quite up to 100 percent. I had as active processes going on in my body as he had himself, and he was a hearty meat eater in those days. He believed in the high protein diet of Pettenkoffer.

I found among other things that Dr. Benedict had made experiments to find out what was the effect of various kinds of physical activity, not only physical but mental activities. He had a man who road a bicycle as hard as he could make it go. He was shut up in a big iron box. I was in such a place for ten hours. It had no connection with the outer air at all. What air I had was pumped in. They measured the amount of oxygen consumed and the amount pumped in and in that way they found out how much oxygen I consumed and that showed how much material had been burned up and the amount of energy resulting was easily figured. The Doctor had me lie down for an hour or two, had me walk for two or three hours from one end of the cage to the other, just two or three steps long. He kept me walking steadily for three hours. He found that when I was lying down my metabolism was at a certain point, when I stood up it increased and when I walked it was very greatly increased.

In another experiment he had a man riding a bicycle and then he had him sit down and study and then he had him go to sleep and he found when he was studying as hard as he could study, studying physics in German, which was about as hard a thing as he could do, he found that his activity was no greater than it was when he was loafing, when he was simply sitting still in his chair and doing nothing. He could scarcely determine any difference between the metabolism carried on at that time and the metabolism resulting from his studying German physics.

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The brain does not use a very large amount of material. Brain workers ought not to eat very heartily. I remember some years ago, a friend of mine who was a very great student. He had a very active brain and studied all the time and he ate very heartily. I met him one night coming home from downtown. It was about 11 o'clock at night. He said he just had been downtown to get a big beefsteak. He had been studying hard all day and a man who worked his brain as hard as he did he knew needed to eat heartily. I was very sorry when some 20 years later this same good friend was brought in suffering from heart trouble and high blood pressure and pretty soon had a stroke of apoplexy that carried him off in spite of all I could do. His arteries were as hard as pipe-stems, undoubtedly the result of his high protein diet, which I had labored very hard to reform him from, but he followed his appetite rather than common sense.

Chittenden, by the way, told me a few months ago when I had a morning visit with me that he was satisfied that the high protein diet did more harm in the world, a great deal more harm than alcohol did, and Dr. Harris of Liverpool not long ago in the preface to his work on heart troubles-- he is head of the Liverpool Heart Hospital-- made the statement that a person on a high protein diet, that is, eating the ordinary mixed diet-- free use of chops, steaks, etc.-- such a person taxes his kidneys ten times as much-- his kidneys are obliged to do ten times as much work as when a person lives on a diet containing only the proper amount of protein.

Carbohydrates of various sorts, starch and sugar and dextrin, these are the real fuels, and fats. Starch, carbohydrates and fats are the real fuels, and when beefsteak is used, protein is taken in such excess that it must be gotten out of the body. Only a very small amount of protein is needed, perhaps a bit of dried gluten or meat not larger than

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the end of my thumb, is sufficient for a day's ration.

The amount of protein in fruit juice was found by Dr. Mendel many years ago sufficient to furnish repair material for the nerves, glands and muscles of the body in a man who worked very hard for a month. He found no letdown in any of his activities. It is possible there may have been so shrinkage in his muscles.

Dr. Graham Lusk many years ago, published on one of his books on metabolism the statement that a man could live a whole year without eating any protein at all.

You can not make a mistake if you cut out all the protein-rich foods. You may cut them all out and not suffer a particle. You may cut them all out. You may never eat another steak in your life, never eat another egg, cut out all animal food with the exception of milk, and you do not even need to eat milk. In the greater part of the world milk is scarcely eaten at all. In China there is practically no milk industry, and there is no livestock industry. The man at the head of the-- I have forgotten now the name of the bureau, a government official, wrote me many years ago that there was no livestock industry in China and that meat of various sorts, beef, fish, fowl, eggs and milk were not included in the food budget of the country. This was south China.

I do not want to spend the entire time talking about diet tonight, but I can assure you that you may safely forget all about the protein in your diet except be sure not to eat too much. Do not eat too much. You are in no danger of getting too little unless you deliberately undertake to remove all protein from your food. You might in time possibly suffer somewhat, but you are very sure to get as much protein as you need. You have in your muscles an enormous store of protein which may be drawn upon for a short time. You always find some protein in ordinary natural

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foods, enough to meet our actual needs. I must say that in a boy who is growing and building up musclesand in a man who is taking active exercise and building up his muscles some protein is required, but not a large amount.

Men in training if they continue very long they find themselves becoming stale and they have to stop training. They can not continue too long. I proved many years ago in the case of one of these men, a professional athlete. He was to compete with a very famous German athlete and he came to see me about a year before. He said, "Doctor, I have found that if I do not eat meat I do not get stale, and I want to have you give me a diet on which I can live continuously. I propose to keep myself in fine condition all the time." He proved that it is not the exercise, not the training itself but it is the diet, especially too large an amount of protein, that makes athletes stale.

QUESTION: What is the treatment and diet for arthritis?

ANSWER: There is no diet that will cure arthritis. Arthritis is unquestionably to my mind an infectious disease that is associated with a changeable climate. It is undoubtedly connected with climate because it is found that in tropical countries rheumatic fever is very rare. It is an infectious disease and it is produced by some form of virus that as yet is not fully understood.

I myself became a victim of rheumatic fever about 50 years ago and very nearly died with it, although the doctors did not know what was the matter. They treated me first for malarial fever, then they thought I had remittent fever and then they treated me for typhoid fever and I still continued ill. In about six weeks I began to get well. When I recovered, my left foot was as stiff as a piece of marble. It was rigid and the flesh was smooth. You could not dent the flesh at all by pressing with the finger and I was quite ill. My heart was very weak. I

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expected to be crippled the rest of my life, but by careful biologic living I recovered from it, but it left a rheumatic tendency behind, and so all my life I have been fighting rheumatism. I have, however, some rheumatic joints. You notice this last joint of my finger is a little crooked. At one time it was very painful. Several other of my joints, nearly all of them, in fact, have had slight attacks, but have been able by careful treatment and biologic living to hold the rheumatism at bay and it has never made a crippled out of me. I am quite free from any embarrassments of that kind, but still I have at times wasting of this muscle. I have had rheumatism of the joints and muscles and nerves and skin. I have one or two spots in my skin that get rheumatic.

I met a lady yesterday who wanted to know what was the trouble with her skin. It was sensitive to touch, very tender and swollen and she could not make out what the trouble was. She said her doctors had never been able to tell her. I was glad to be able to tell her what the trouble was. It was rheumatism of the skin. It may affect any part of the body.

It is certainly influenced by diet. There is a Philadelphia doctor who is thoroughly convinced that starch and carbohydrates in general are chiefly responsible for rheumatism. This is a great mistake, I am sure. He has been led to this error by finding that when he lived on a very starch diet, used a great deal of sugar that he suffered more from rheumatism. My feeling is that the cause of his trouble was that on such a diet he got a very great deficiency of vitamins and if he had used more vitamins he would have less trouble.

I found when I took more vitamins-- when I began to follow a diet that had all the vitamins in it and all the minerals in it that my rheumatic symptoms rapidly disappeared, and I am quite sure that every

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finger of my right hand would be deformed today if it had not been for a careful following of a complete dietary with a low protein element for the reason that protein overtaxes the kidneys so enormously-- ten times the work required of them, when one eats freely of protein from any source, animal or vegetable, but it is very much worse if one eats animal protein for the reason that it decomposes and makes a great deal more poison for the kidneys to remove. It demands much more work of the body than vegetable protein. It is almost impossible for one to eat an excess of vegetable protein if one eats it in the normal form and even if one takes quite freely of Protose and other forms of vegetable protein he is not likely to suffer as he does if he eats animal protein either eggs or meat, for the reason that it does not decompose so readily as does animal protein. It does not undergo decay. It does not produce putrefaction in the body, and so the amount of toxins to which the body is exposed is nothing like so great as when one lives on animal protein.

The most putrefactive all all of the proteins is white of egg. White of egg I think should never be used at all. At any rate, it is one of the most dangerous of all the proteins. Raw white of egg is worst of all. Cooked white of egg is not so bad, but cooked white of egg often escapes from the body entirely undigested. Whenever one eats poached or hard boiled eggs he is very certain to find in the evacuations portions of the white of egg not at all digested but will readily undergo putrefaction in the colon and so become an element of harm.

QUESTION: Why do lack of vitamins cause skin eruptions accompanied by itching? The patient has always eaten fruits and vegetables in preference to meats and pastries.

ANSWER: Well, I should say that there are many different vitamins and each one has its particular function in the body and certain combinations of different vitamins also have specific functions, what is known as synergesis, which is the effect of combinations of

finger of my right hand would be deformed today if it had not been for a careful following of a complete dietary with a low protein element for the reason that protein overtaxes the kidneys so enormously-- ten times the work required of them, when one eats freely of protein from any source, animal or vegetable, but it is very much worse if one eats animal protein for the reason that it decomposes and makes a great deal more poison for the kidneys to remove. It demands much more work of the body than vegetable protein. It is almost impossible for one to eat an excess of vegetable protein if one eats it in the normal form and even if one takes quite freely of Protose and other forms of vegetable protein he is not likely to suffer as he does if he eats animal protein either eggs or meat, for the reason that it does not decompose so readily as does animal protein. It does not undergo decay. It does not produce putrefaction in the body, and so the amount of toxins to which the body is exposed is nothing like so great as when one lives on animal protein.

The most putrefactive all all of the proteins is white of egg. White of egg I think should never be used at all. At any rate, it is one of the most dangerous of all the proteins. Raw white of egg is worst of all. Cooked white of egg is not so bad, but cooked white of egg often escapes from the body entirely undigested. Whenever one eats poached or hard boiled eggs he is very certain to find in the evacuations portions of the white of egg not at all digested but will readily undergo putrefaction in the colon and so become an element of harm.

QUESTION: Why do lack of vitamins cause skin eruptions accompanied by itching? The patient has always eaten fruits and vegetables in preference to meats and pastries.

ANSWER: Well, I should say that there are many different vitamins and each one has its particular function in the body and certain combinations of different vitamins also have specific functions, what is known as synergesis, which is the effect of combinations of

different vitamins. One needs to make a thorough study of this subject in order to understand the effect of different vitamins. For instance, vitamin A seems to have particular charge of the skin and of the upper respiratory organs. When one has a deficiency of vitamin A his skin is likely to suffer, and this is the thing that is likely to occur especially in elderly people and persons who suffer from bowel troubles and have very active putrefaction going on in the colon suffer from damage to the vitamin, the water-soluble vitamins particularly, B and C they used to be called-- riboflavin is the name commonly employed now and nicotinic acid. They are two of the more prominent of the B_6. These are among the more prominent of vitamins that used to be known as B or B complex.

We have vitamin D, which is the sunshine vitamin. This is particularly valuable in controling the deposit of lime or the use of lime, but in the case of each one of these vitamins there are many, many uses in the body.

QUESTION: What causes cramps in the top of the feet?

ANSWER: I think I will speak about cramps anywhere. Cramp is a very interesting phenomenon. I often think of a muscle cramping as a span of horses I used to drive that used to run away sometimes. A cramping muscle has run away, gotten out of control. It contracts when we do not want it to contract. Muscles usually contract in response to an order sent from the brain. That is a wonderful things, my friends, to see a muscle contracting under the impulse of a message sent from the brain. How does the muscle get that message? What happens when a muscle gets an order from the brain to contract? Nobody knew much about that until a few years ago when an English doctor made a careful study of it and published a little book which is published in this country, The Physiology of Muscle Activity, and the doctor found that when a

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muscle receives an order from the brain to act and when a muscle contracts, this is what happens: An impulse somewhat like an electrical impulse, but not just the same as electricity-- it is a vital message that travels at about the rate of 100 feet a second, whereas some forms of electricity travel almost with the speed of light, going around the world in less than a second. This message travels more slowly. When the message reaches the muscle a chemical change takes place in it. Lactic acid is produced by a combination of oxygen with glycogen stored in the muscle. Some of the glycogen is burned up by what is known as wet combustion and produces lactic acid. Lactic acid causes the muscle fibre to change its character. It thickens and shortens very much as an earthworm does stretched out on the sidewalk after a rain after you drop a little acid on it. It will contract and become thicker and shorter. That is the thing that happens in the muscle. It is this acid that is formed that causes the muscle substance to shorten. That is what makes the fingers close and until the acid is washed out it can not relax again.

There is another interesting thing I can tell you. When you think of contracting a muscle, the muscle begins to get ready to contract. You say, "Now, I think I will shut my hand" or "I think I will close my hands" or "I think I will strike something." The moment that you form the resolution to do that, think about doing that, the muscle fills up with blood so as to be ready to act instantly the instant you send the order. Now, this activity is so rapid and so intense and the amount of acid that is formed is so great that when a sprinter is running at top speed he produces at least a tumblerful of lactic acid in one minute. A runner produces a teaspoonful of strong lactic acid in one second. It is a most remarkable thing that when the muscle gets ready it fills up with blood. When a muscle is idle it is pink and pale, but when it is filled with blood it is crimson.

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How do we know that? By experiments upon animals. The amount of blood is increased. Here is an experiment by an eminent French physiolcgist. He tapped an artery that feeds a chewing muscle of the horse. He tapped this artery and he noted the amount of blood when the muscle was at rest, the amount that ran out of the artery, and then he fed the horse and when the horse began to chew and grind kernels of corn the amount of blood was increased, 30 times as much blood going through the muscle when it was active as when it was resting. The important thing is that the muscle gets ready to act quickly. This blood is passed through the muscle not to feed it, not to bring the energy necessary to carry on the work as that is already stored up in the muscle, but for the purpose of washing the acid out so the muscle can go on acting. When a muscle has once been contracted, when the fingers are closed, they can not act again until the acid is washed out. Think what is happening, my friends, to a pianist whose hands and fingers are going up and down the keyboard actively striking the keys! Just think of the number of movements.

Now, nothing but an infinite power, my friends, can arry on such an activity as that and keep all the activities exactly balanced. It is beyond our comprehension how such a thing can be possible. Certainly it is not a mechanical thing, but there is a power behind all of these activities of the body that controls it. Is there anything in the world more sensible than to keep in harmony with that power and find out what is the normal order, what is the order established by the creative intelligence that made us and rules over our bodies and directs all the activities going on not only in our bodies but in the bodies of every creature and of every flower and every little blade of grass over the whole world and throughout the whole universe. That is the power that it is well worth while for us to obey, to give attention to the order

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established so that we may live the most efficient lives and the most comfortable lives and walk in a safe and narrow way.

Now, my friends, one of the most remarkable things I know of is the fact that our bodies are filled with voices talking to us and telling us what to do and where to go. I wish I had time to talk to you a little more at length about that. Those of you who are here the next few months will hear a good deal about the wonderful machinery of our body and how it is directed.

I suggest to you if you want to read a book more interesting than any novel you ever read you read a work by Dr. W. B. Cannon of Harvard University, recently retired, on "The Wonders of the Body." The human body is one of the most wonderful things in all the universe and the same thing is true of every animal.

One simple little thing I might mention is the creation of the gastric juice, an acid produced in the gastric juice that the chemist handles with very great care, hydrochloric acid, a highly corrosive acid. It takes the most powerful electrical current to break it up into its components, but the stomach does that thing with no effort at all and with nothing harmful happening to it because there is an infinite chemist behind it looking after it. Our whole bodies are being carefully cared for every second of our lives.

QUESTION: What is the cause of gas?

ANSWER: It is produced by germs. It is an infection. The real cause of gas is the colon germ. The colon germ makes gas. If the gas is odorless it is not dangerous; it is only inconvenient, but it may be very inconvenient. It is not dangerous because it is making gas, for it is at the same time making lactic acid.

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Oct 1947

Sanitarium News

Article

Vitamins and Minerals

October 26, 1942

Miss Werstein:

This is the vitamin material about which Doctor asked. It was used in preparing the circular for Multi Vitamin and Mineral Tablets and will probably be used again very soon, so we had a copy of it made for you, which you may keep.

Josephine F. Williams

VITAMINS

A

Vitamin A in plant life is in the form of carotenes, the fat-soluble substances which give the yellow color to fruits and vegetables. The deep orange and dark green vegetables are among the richest sources of these precursors of vitamin A. These carotenes are converted by the body into the colorless, active vitamin A.

Vitamin A is essential to normal growth and development. It is essential to reproduction. It is needed in the maintenance of the health of the skin and all other epithelial tissues of the body, as well as for the important part it plays in the formation of visual purple, the preventive of night blindness.

A deficiency of vitamin A in varying degrees causes:

Night blindness.

Softening of the cornea.

Lessening or loss of secretions of the sebaceous, sweat, lachrymal and salivary glands.

The skin becomes dry and rough, and horny growths appear.

Dermatosis.

Vaginitis.

Tooth malformation.

Formation of urinary calculi.

Lowered resistance.

Susceptibility to respiratory diseases especially in children.

Experiments by Sherman showed that abundant feeding of vitamin A to young animals increases the weight and bone development.

The daily intake of the provitamin A carotene should not be less than 5,000 International Units or 3,000 micrograms. When there is evidence of deficiency, it may be increased to 20,000 or more International Units. One

International or U. S. Pharmacopeia Unit, equals .6 of a microgram of vitamin A.

Thiamin (B_1)

Thiamin, or B_1, the first and best known of the B Complex group, is essential for the proper utilization of the carbohydrates (starches and sugars). It aids in maintaining normal appetite, digestion, circulation, healthy nerve tissues, and normal growth.

Thiamin is found most abundant in the outer coating of the seeds of plants and in green, leafy vegetables. It is soluble in water, and is destroyed slowly by oxidation. Many foods lose 15 to 25% during the process of cooking and 15 to 25% or more is dissolved out in the cooking water.

A deficiency of thiamin in varying degrees produces:

Headaches,

Nausea,

Dizziness,

Weakness,

Constipation,

Indigestion,

Irritability,

Restlessness,

Difficulty in concentration,

Neurasthenia and neurosis,

Insomnia,

Loss of appetite,

Neuralgia and neuritis,

Muscle atrophy,

Paralysis,

Enlargement of the heart,

Edema,

Tachycardia

Poor utilization of carbohydrate,

Beriberi.

The daily intake should be from 600 to 1000 International Units or 1800 - 3000 micrograms, or 1.8 mgs. to 3 milligrams. One International Unit or United States Pharmacopaei Unit is equivalent to 3 micrograms. In cases of deficiency, the intake may be increased to 3,000 I. U. or more. Liberal doses should be taken by pregnant and nursing women, and those suffering from diabetes, nerve and mental diseases, infectious diseases, alcoholism, and senility.

Riboflavin (B_2, or G)

Riboflavin, the second member of the B complex family, is sometimes called B_2, or G, ~~is~~ widely distributed in plant and animal tissue, and it may be a part of every living cell. It is a pigmented substance with a greenish yellow fluorescence when exposed to the light, as seen in milk and egg white. Riboflavin is converted by the body into oxidation enzymes which are oxygen carriers in the cells.

Riboflavin, like thiamin, is soluble in water, but is not so readily destroyed by oxidation. It is destroyed by light and alcohol. The loss in cooking is that which is dissolved out in the cooking water and thrown away.

A deficiency of riboflavin causes:

Inflammation of the lips and tongue,

Red, shiny, lower lip,

Sore and burning tongue (magenta color).

Fissures at the corners of the mouth.

Soreness about the nose.

Inflammation, burning and itching of the eyes.

Visual fatigue and dim vision.

May be factor in cataract.

Dermatitis.

Shortening of life span.

A factor in pellagra.

The daily intake should be 2-3 milligrams, or 800 to 1200 Bourquin-Sherman units. In cases of deficiency, the intake should be increased to 3-15 milligrams. 1 mg. of riboflavin is equivalent to 400 Bourquin-Sherman Units.

Niacin (Nicotinic Acid)

Niacin, or nicotinic acid, another of the water soluble vitamin B group, is found in the seeds of plants, whole grain cereals, green leaf vegetables, yeast, milk and egg yolks. It is not so easily destroyed by oxidation as thiamin, but may be dissolved out in the cooking water. The function of niacin seems to be as an aid in the oxidation processes in the body after being converted into coenzymes. It is essential in maintaining the health of the nerve tissues, skin, and all the epithelial tissues of the body. A deficiency causes:

Weakness, lassitude.

Loss of appetite.

Indigestion.

Nervousness and irritability.

Diarrhea.

Inflammation of the mucous membrane of the alimentary tract from the mouth to the rectum.

Sore mouth, with a fiery red, smooth tongue.

Mental depression, often delirium.

Fever and extreme prostration.

Dermatitis--inflammation of the skin, leaving it roughened and thickened or thin and atrophied. The exposed surfaces suppurating or dry.

Pellagra.

No recommended daily allowance has been established for this factor.

Pantothenic Acid.

Pantothenic, one of the more recently discovered members of the B complex group, is a constituent of every living cell. It is essential for normal nutrition, and it may be essential for maintaining the health of the spinal cord. Pantothenic acid may or may not cure lesions of the spinal cord, as in Addison's disease, depending upon the duration of the disease before treatment is started. It is essential to the growth of lactic acid bacteria.

Pantothenic acid is found principally in yeast, egg yolk, milk, broccoli, kale, sweet and white potatoes, pumpkin, tomatoes, dried peas, rice and wheat bran, soybeans and peanuts. Other vegetables, cereals, and some fruits contain a moderate amount of this vitamin.

A deficiency of pantothenic acid causes:

Dermatitis.

Ulcers of the mouth and entire alimentary track.

Degenerative changes of the central nervous system.

Mental dullness.

May be a factor in Epilepsy.

Degenerative changes in the kidneys and adrenals.

Possibly a grey hair factor.

The daily requirement for human beings has not been established.

Pyridoxine (B_6)

Pyridoxine or B_6 has also been called vitamin Y factor. It is one of the B Complex group but all its functions in human nutrition are not yet clear. It affects the internal organs as to the utilization of the food intake and it may be an anti-grey hair factor.

Pryidoxine is found in the seeds of plants, yeast and molasses.

A deficiency of this vitamin produces symptoms similar to riboflavin deficiencies:

Inflammation of the mouth, tongue and lips.

Dermatitis--pellagra.

Acrodynia--an eruptive disease with increased sensibilities and prickling sensations in the hands and feet.

Rheumatoid pains in the hands and feet.

Anemia from typhus disease.

Possible epilepsy.

Poor growth.

The daily requirement for human beings has not been established.

CHOLINE

Choline is one of the water soluble vitamins essential to normal nutrition. It is a necessary aid to maintaining the health of the liver and kidneys. It is essential to egg production in hens.

Choline is found in egg yolks, yeast, soy beans, mustard seed and milk.

A deficiency produces:

Fatty liver.

Cirrhosis of the liver.

Renal hemorrhages.

The daily requirement has not been established.

Ascorbic Acid (C)

Vitamin C, ascorbic acid or cevitamic acid, is another water-soluble vitamin which is well known as a preventive of scurvy. This vitamin is essential to the formation and maintenance of the intercellular cement-like substance which holds the cells in their proper relation to each other in all the body tissues.

Ascorbic acid is found in raw fruits and vegetables, especially in the citrus fruits. It is destroyed easily by oxidation in the presence of alkalies and toxins. Cooking temperatures destroy a large part of vitamin C, and much of it is dissolved out in the cooking water. The acid fruits and vegetables, as pineapples, tomatoes, and potatoes, retain more of their ascorbic acid content after cooking than most foods.

Bacterial toxins and toxins from sedative drugs cause a rapid and marked depletion of vitamin C in the body. Injuries, worry, stress and strain all increase the rate of destruction of vitamin C.

A deficiency of ascorbic acid in varying degrees causes:

Hemorrhages from fragile capillaries in the skin and mucous membrane.

Imperfect bone and teeth formation.

Inflammation and swelling of the gums.

Weakness and lassitude.

Insomnia.

Anemia due to hemorrhages and disturbance in the blood cell formation in the bone marrow.

Edema.

Sore extremities.

Lowered resistance.

The recommended daily allowance is 1500 I.U. or U.S.P. units or 75 mgs. In cases of deficiency, the intake may be increased 4,000 I.U. or more.

One Mg. is equivalent to 20 International or U.S.Pharmacopeia units.

Vitamins D

Vitamins D or Anti-rachitic vitamins is a group of several vitamins two of which are important, D_3 and D_2 (calciferol). Vitamin D_3 is the antirachitic vitamin found in fish liver oils, irradiated milk and other irradiated animal foods. It is probably the D_3 vitamin which is developed in the skin when exposed to ultra violet light. Vitamin D_2 is the activated ergosterol (calciferol) as used in viosterol. It is present in irradiated yeast. Eggs contain vitamins D_2 or D_3 depending upon the feeding of the hens.

The finction of these vitamins is well known as a preventive of rickets as they aid in the utilization of calcium and phosphorus.

These vitamins are soluble in fat and are not found in any appreciable amounts in natural foods, except the irradiated foods. They are produced by the action of ultraviolet light, artificial or sunlight, on the sterole, provitamin D, in the skin.

A deficiency in varying degrees of these vitamins produces:

Irritability.

Weakness.

Rickets.

Osteomalacia.

Tetany.

Possible skin disease as psoriasis and acne.

The daily allowance, 500 International Units.

MINERALS

Calcium

Calcium, one of the important elements of the bones and teeth is essential to normal growth and development. Although 99 percent of the calcium is found in the skeletal structure the smaller amounts found in the soft tissues and fluids of the body are equally important. In fact, when the diet is deficient in this mineral, it is taken from the bones in order to keep the calcium in the body fluids constant.

The best source of calcium is milk. Nuts and green vegetables, especially the green leafy vegetables that are practically free of oxalic acid are good sources of calcium.

Calcium is one of the minerals which is most likely to be deficient in the average bill-of-fare.

A deficiency causes:

Decreased rate or cessation of growth.

Degenerative changes in the intestinal flora.

Inflammation of the intestines.

Hyperirritability of the muscles.

Hyperplasia of the parathyroid glands.

Rickets.

Sterility in adults (?)

Lactation may be reduced or stopped.

Shortening of span of life.

A liberal supply of calcium in the diet, as shown by Dr. H. C. Sherman and others, produces "a more rapid and efficient growth with higher adult vitality and a longer prime of life." Which gives evidence that it is just as essential for adults as for children to take liberal amounts of calcium daily in order to enjoy the benefits of super health and a long life.

The daily requirement for children and adults is .8 to 1 gram. For

pregnancy and lactation 1.5 to 2 grams may be needed. The intake of calcium should be increased above the daily requirement in all cases where there has been a deficiency in the diet.

Phosphorus

Phosphorus like calcium is an essential part of the bones and teeth. Approximately 80 percent is found in the bony structure. It is also an essential constituent of the fluid and every cell of the body tissue. It is essential to normal growth and development.

Phosphorus is associated with the protein in foods. Milk, although it is higher in calcium, is a good source of phosphorus. The flowers and seeds of plants are high in phosphorus while the leaves and stems contain more calcium.

Phosphorus deficiency:

Retards and stops growth and development.

Produces a gradual degeneration of the bone structure when the phosphorus is called on to supply the soft tissues and fluids to keep the phosphorus content constant.

Rickets.

Premature death.

Daily requirement of phosphorus is .8 to 1.3 to 2 grams.

Iron

Iron, like calcium, is frequently deficient in the average bill-of-fare. The amount of iron in the body is small but vital. Seventy percent of it is found in combination with protein in the blood. It is an essential constituent of the hemoglobin, the outstanding material that gives color to the red blood cells. It is the substance which gives color to the nucleus of other cells of the body. The hemoglobin has the important function of carrying oxygen from the lungs to the tissues and carrying the waste product, carbon dioxide, away from the tissues to the lungs.

Food iron is found most abundantly in the dark green vegetables and grasses, especially the green leafy vegetables that are practically free from oxalic acid. The intake of liberal quantities of iron-rich foods insure better blood and more oxygen carrying agents; thus aiding in the production of more abundant health. The hemoglobin of the blood should not be less than 100 percent by the Sali method.

A deficiency of iron in the diet results in some kind or degree of nutritional anemia and a lowered resistance.

The daily requrement is 10-15 milligrams but when there has been a deficiency in the diet, it should be increased and doubled.

Copper

Copper is known as one of the trace elements. It is not a constituent of the hemoglobin but its presence is necessary for the synthesis of hemoglobin.

Traces of copper are so widely distributed and so small a quantity is needed that there is not likely to be a deficiency in the average diet. Six tenths of a milligram seems to be the daily requirement.

Magnesium

Magnesium like calcium and phosphorus is an essential constituent of the bones and teeth where 70 percent of it is used. The remainder is largely localized within the cells of the blood and muscle tissues.

Magnesium is widely distributed in plants in combination with the protein of the plant tissue and as salts in the plant juices. It is an essential part of the chlorophyll.

A deficiency disturbs the utilization of calcium and phosphorus? There is a cessation of growth and finally death.

No standards have been set for the daily requirements for the adult. It has been estimated that children four to seven years of age require 13 milligrams per kilogram of body weight.

Manganese

Manganese, one of the trace elements, is well distributed throughout the vegetable kingdom. It is indispensable to plant development. Manganese is generally accepted as being essential to human nutrition although its functions are not clearly understood. It probably aids in reproduction and lactation.

There is little known about the human daily requirement although it has been suggested that the diet of children should contain .20 to .30 milligrams of manganese per kilogram of body weight. An over dose of manganese has a toxic effect on plants and animals.

Zinc, Cobalt, and other trace elements although essential to good nutrition are rather widely distributed in foods and the quantity needed is so small there is not likely to be a deficiency in the diet.

Strasbourg,
November 20, 1842.

REPORT ON HYDROTHERAPY

(By Dr. H. Scoutetten)

Mr. Le Maréchal:

Some days have passed since my trip to Germany. I wished immediately, upon my arrival, to thank you for having authorized me to make this visit in the interest of science, and to have enabled me by this act of kindness, to meet ambassadors and diplomatic agents representing France to the foreigner. I have been hindered in the accomplishment of this thought of acknowledgment by the incessant care given to sick men whom I have found on resuming my service, and by the necessity of arranging the material for this report.

The numerous facts that I have collected seem to me very important, so I do not hesitate from this time on to call the attention of your Excellence to the results which they must have under the double respect of humanity and of science.

I recognize, however, that the nature of this work does not permit me to present, with the necessary details to lead to conviction, the facts that are connected with hydrotherapy; to attain this result, a more complete and more scientific work is necessary. I wish to attempt it and to pursue it with ardor. I will have the honor to submit to your judgment how it will end. Today I have no other object but to rapidly reveal the origin and the progressive march of hydrotherapy, its action in acute and chronic maladies, its influence on general therapeutics and on the customs of the country where it was born. I follow in this narrative the itinerary of my journey and the successive development of my thoughts.

I left Strasbourg the 20th of last September, possessing then only incomplete notions about hydrotherapy. Some cures of grave chronic maladies against which ordinary medical means administered by myself and other distinguished doctors of Paris, having completely failed, have led me to think that this form of treatment ought not to be rejected without examination;

LECTURE IN THE SANITARIUM LOBBY, DECEMBER 26, 1942

By

DR. JOHN HARVEY KELLOGG

Miss Browning said some one wanted me to talk about the approach to old age, but I think a livier subject would be The Blessing of Cold Air. I made the discovery-- for me a new discovery though doubtless others have discovered it long before-- some years ago. I think about 25 years ago, my attention first was called to it that the danger in cold weather in civilized countries is not from cold. The winter danger is not from cold but from overheating. That seems almost absurd, doesn't it.that we should suffer from neat in cold weather. Now the fact is that far more harm is done by heat in the winter time than in the summer. We have very few cases of sunstroke here in this part of the country. There are not many cases of sunstroke in this country. People have sunstroke only in special circumstances. Generally people who suffer are people who are accustomed to drink and who are accustomed to many other excesses.

The real cause of danger in the winter time is excessive heat and not from cold. Now, how do you make that out? In the first place, a very remarkable circumstance that is worth considering, that is, when an exploring party has gone up tc the North Pole or up to that

region they invariably come back with a report of perfect health. There is only one case I know of in which one died from natural causes and that was Capitan Hall. Captain Hall made a new experiment. He did something that had never been done before his time. He was the predecessor of Stefansson. Stefansson you know boasts of the fact that he lived nine years up there and lived as an Eskimo, but Captain Hall did that before him a good many years ago and he died of apoplexy on the third trip. He wrote two large volumes of his expedition which I perused with a great deal of interest. Captain Hall got so accustomed to the Eskimo mode of life, the use of raw food, blubber and a great deal of fat and a great deal of meat, he became so accustomed to it that he followed it when he got home. One day a friend met him and he said he was suffering from headache. "Well, what are you going to do?" He said, "I am going down to the butcher shop and eat two or three yards of sausage." He just simply poured it down, raw sausage." He said that was the only way to cure his headache. It was not very long after that before he had a stroke of apoplexy. It was because his body was oversaturated with protein.

Stefansson discovered the art of the Eskimo that makes it possible for him to live almost entirely without vegetable food of any kind, although he treasures every little speck of plant food he can get. There are a

few species of berries so hardy they grow almost to the north pole. The summers are very hot there. Stefansson demonstrated many years ago that the amount of sunshine that falls upon any surface of the earth is about the same as that falls on any other on the average. In the summer time in the region of the arctic circle they have a continous day. There is at least one day of the year when the sun does not set at all, when it does not even begin to set. It sails clear above the horizon all the way, just above the horizon. The further you go up north, up at the north pole you have the sun directly overhead. Vegetation grows very rapidly. It grows day and night. Ordinarily plants grow only at night or very little in the day time. They gather in their food during the day under the action of the actinic rays of the sun, but they actually make their growth during the night. I one time watched a plant, a South American reed. I happened to notice it standing up against a wall down in California in a little town there they call Mecca because it is in the Coachella desert in California. I spent a few months there one winter and I observed this plant in the evening about eight o'clock. It happened to be right against the wall and I made a mark on the wall exactly where it had been at that time. Then I called again at six o'clock in the morning-- I was leaving there that morning-- so it was my last opportunity to make an observation. I made another mark and the two marks were eight inches apart. It had actually grown eight inches in ten hours. They grow so rapidly, in one case I sat down beside one of these South American tropical fast growing plants. I am not sure of the species this moment, but I sat down beside it and saw that it was growing so fast-- a gentleman

told me it was growing an inch an hour. I sat down beside it and watched it grow. I was making a little research and I sat down and measured its height and in the course of an hour it had grown over an inch. I could almost see it grow. In the night it grew almost twice as fast as in the day time. The same thing is true of people. Children grow almost entirely when they are asleep. They do not grow in the day time when they are running about. Then they are using their energy in activity and in gathering in material, digesting food, etc., but the night is the time when new material is deposited and the actual building takes place. I have observed that in children that have had but little sleep do not grow fast. In fact, I suffered from that particular thing myself.

I started in the world when I was ten years of age. I did not leave home but I put myself under restricted conditions voluntarily and to support myself entirely. From that time on I purchased every book I ever owned except a few gifts and every garment that I ever wore. I paid my board in work or in cash and have been no cost to anybody. I heard my father suggest one day to a friend and neighbor that Johnny was getting pretty nearly big enough to be self-sustaining, so I stepped up to him the next day and said, "Father, if you will pay me for what I do for you at the same price which you pay to other people when they do the same work equally well, I will do for you everything you do for me. "All right," he said, "what is your plan?" So I told him my plan that he would give me a certain amount of work to do for my board. We had plenty of work. We had two horses and a cow and a wood pile and a general store to do errands for and a factory with a lot of men working in it. so there was plenty to do. I did chores for my board. I got up at half past five in the morning, usually five o'clock, sometimes half past four to milk my cow and take care of my horses and to do the general chores and to get ready to get into the shop to work at seven o'clock

in the morning. I had a garden to look after too in the summer and helped with the washing on wash day, so I had plenty to do. I learned a trade and in a week was earning a dollar a day and in three months I was earning two dollars a day and I stayed at home. Instead of going to school I did my studying at home and took the examinations. I was never in school in all three years and a half before I went to the university, but I passed my examinations and got my credits. On the last day I remember I felt rather happy when they made me valedictorian of the class when I was 16 and my standing was 99.7. I had been tardy once. That was one year I went to school most of the time. I was out a part of the time, but I passed my examinations, so they gave me credit for the time I was excused. In fact, I had an attack of fever and ague so I was laid up for a little while and laid the foundation for tuberculosis that I suffered from and destroyed one of my lungs, so you see I do not use it. I have not used it since I was about 17 years old. If I had not lived biologically, which I began doing when I was 14 years old-- I stopped the use of meat at that time-- I should have been in the cemetery many, many years ago. Doctors gave me up to die twice. I had a relapse during the world war because I sent my associates off to the war one after the other and took on their work until I was driving day and night sometimes two days in succession without stopping to eat. I remember on one occasion for 48 hours, and I had my hands full, first the operating room eight or ten hours, then over to my consulting room for two or three hours and then after that until midnight in my special treatment room. I had been in Vienna for some years before and learned the new methods of dealing with throat troubles, so I had started here in Battle Creek a throat clinic and nose clinic, eye, ear, nose and throat clinic. Specialists were very scarce in those days. You had to go to Detroit or Ann Arbor to find a specialist and I had my office

very full. It filled up about six o'clock and then I could rarely get through before eleven o'clock. It took me some years to get a specialist trained to take my place.

So I have had a very busy life and notwithstanding I was frail and I had tuberculosis early and then had a relapse a second time, and the second time I was given up to die for sure. There was no hope at all for my recovery. I went right on with my work. My tuberculosis was on the outside of the lung instead of the inside, so it never was in my sputum so I did not disturb anybody. The whole pleura of my left lung was tuberculous so it became bound fast to the wall of my chest. I got over that and attribute it to the fact that I live biologically.

I began telling you this little story to tell you why I did not go to school, why I got my education at home at night after others had gone to bed and all my life I have worked until ten o'clock or twelve and often two or three in the morning and a large part of my life I have gotten along with five or six