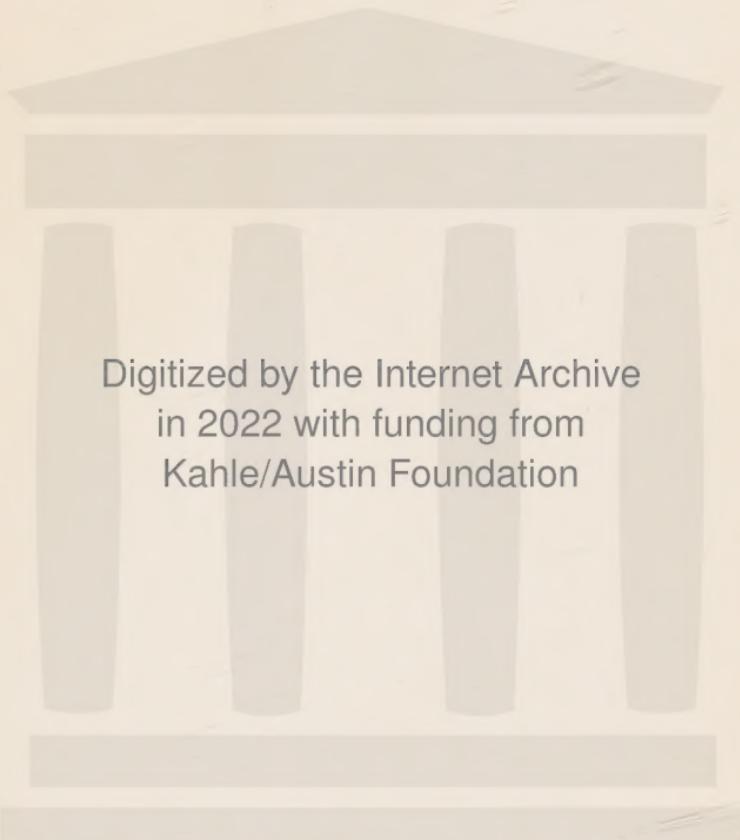


Optimum
health



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OPTIMUM HEALTH

BY

ADELLE DAVIS

CONSULTING NUTRITIONIST

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ADELLE DAVIS

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OPTIMUM HEALTH
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DEDICATED TO YOU WHOSE
IMPERFECT HEALTH OR
INCORRECT WEIGHT HAS
ROBBED YOU OF THE FULL
FUN OF BEING ALIVE . . .

PREFACE

A few foods not in general usage have been recommended in this book. This may cause criticism by those who wrongly consider these foods to be medicines. Our forefathers ate the embryo of grains in much greater quantities than have been recommended here. A group of people living in Labrador, who are remarkably free from illnesses common to us, use large quantities of fish oil poured over their food or soaked into bread, as a youngster might eat gravy. Experimental animals which must be kept healthy are given fish-liver oil and yeast as a routine procedure. The health of these animals, even in the name of science, is certainly no more important than the health of your family.

Just as it is difficult to translate works from one language into another and always retain the exact shading of meaning and the niceties of the original language, so is it difficult to "translate" scientific findings into popular terms. However the tremendous need of the public for a greater practical knowledge of nutrition justifies, I believe, the handling of the subject in the manner used in this book.

The author desires to express her great indebtedness for constructive criticism of the manuscript of this book to Doctors A. J. Linck, L. A. Wise, Eugene Ziegler, L. D. Huffman and W. A. Swim; Miss Olive Burchfiel and Mr. Gleb Spassky.

A. D.

June, 1935
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Los Angeles, California.

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Chapter 1

THE JOY OF OPTIMUM HEALTH

Everyone should have a sound fundamental knowledge of nutrition which would be so much a part of himself that he would apply it without conscious effort in his everyday life.

Not long ago I was talking to an alert young farmer who raised chickens. He derived most of his income from the eggs he sold, and at that time eggs were no more than sixteen cents a dozen. Yet the amount of information he had gathered in order to make what little profit he could from his sixteen-cents-a-dozen eggs was astonishing.

He knew exactly the composition of the chicken feed in terms of fat, carbohydrate, and protein. He knew that he fed his chickens fish-liver oil to supply vitamins A and D, and he knew why these vitamins must be supplied. He fed wheat germ to furnish vitamins B and E, and he was also well aware of what would result in his flock if these vitamins were inadequately supplied. He also fed his chickens powdered milk, and he knew what nutrients it offered them.

If the price of eggs should fall, he knew how to change the feed so that the hens would not lay during that time and would thus preserve their vitality.

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Conversely, if the price of eggs was high, he could vary the feed in order to increase egg production. He realized that keeping his flock well was much more profitable than letting them become sick and then expecting a veterinary to save them.

These were only a few of the scientific facts he had gathered about the health and nutrition of chickens, and all for a few cents profit on eggs.

That a poultryman should know so much more about feeding his chickens than the average mother knows about feeding her children is a disgrace to the nation. Is the profit on a few eggs more important than your health or the health of your family? Of course it is not. Yet every person is willing to learn all he can about making money, which may bring him more or less happiness, while he is frequently unwilling to learn anything about his health, which is essential to all happiness.

Unlike the poultryman, he waits until he is actually ill and then goes to a physician, not to prevent ill health, but to cure ill health. Were he to take the same care in choosing his diet that the poultryman takes in feeding his chickens, optimum health, which should be the desire of every intelligent person, might be his.

But one cannot appreciate what one has never experienced. So it is that thousands of people pull themselves out in the morning more dead than alive, and force themselves through a weary day's work. They say the food is badly cooked when it is only their appe-

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tites at fault. They snap at the office girl and spank the children. Colds are taken for granted during the winter season. Over-wrought nerves are reinforced with coffee and alcohol. They go to bed to roll and toss, and they call themselves normal.

The majority of people like to think of themselves as normal in every respect. This, perhaps more than anything else, makes them unwilling to admit that their health is not perfect. I find that patients who come to me, say to gain or to reduce, all too often stress the fact they are "absolutely healthy in every way." Their weight is possibly twenty or more pounds from optimum, but they do not consider this a departure from normal health.

In taking their history, I ask, "Have you had any colds during the past year?"

"Oh, yes," they answer indifferently, "but they weren't bad."

"Have you had any trouble with your sinuses?"

"Yes," they reply, "but that is much better now."

Then I hear how severe the infection used to be, so that now it seems relatively unimportant.

"Do you have any other infections?" I ask.

"No." After a moment's hesitation they continue. "I've had a low-grade colitis for a long time." Or perhaps they tell me of a chronic appendix, a gall bladder, a mastoid, or some other infection which they have had, or still have. Just because it is not severe enough to make them seriously ill, they consider it scarcely worth mentioning.

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"Are you ever troubled with indigestion?" I question.

"Sometimes. I always take soda and that helps. Of course I can't eat—" and they admit there are a half dozen or more foods, invariably those most valuable to health, which they have eliminated from their diets because they are convinced they cannot digest them.

"Are you ever constipated?"

"No, not at all," they answer with satisfaction.

"Then you never take cathartics?"

"Oh, I know better than to let myself get constipated. I take — every night," and they name some cathartic.

"Are you nervous?" I ask.

"No." They reconsider a moment. "Well, everyone's nervous to a certain extent."

"Do your gums ever bleed?"

"Yes, occasionally." By way of justifying themselves, they may add, "Anyone's gums would bleed if he brushed them as hard as I do mine."

"Have you had any cavities during the past three years?"

"My teeth are in perfect condition," they perhaps reply.

"I am not asking if you've had dental attention," I explain. "I want to know whether your teeth are immune or susceptible to decay."

"Of course I've had cavities," they answer.

Similar answers are often given to my questions throughout the taking of an entire history.

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Such cases as these, I sincerely assure you, are by no means unusual. These individuals really want good health; they want so much to have it that they are usually willing to deceive themselves into thinking they are far healthier than they really are. The tragedy is, and this is true of almost everyone, that they do not recognize the subtle danger warnings.

Until people learn, first, that such subtle departures from positive health can be avoided, and second, that these warnings indicate certain abnormalities which, if not overcome, can lead to conditions a hundred times more serious, they can make little progress toward optimum health.

The main stumbling block is that people do not have sufficiently high ideals for health. All too frequently they do not understand the actual meaning of health. In the majority of cases people do not know how to prevent ill health, even though it be their greatest desire. Would that everyone could have just a small part of the young farmer's knowledge of how to feed chickens!

Not yet a century ago, a half-paralyzed, near-sighted Frenchman sat hunched over his microscope, watching tiny animals which caused many diseases. Years after Pasteur had told the world of his theory of the bacterial origin of disease, men scoffed, laughed, called him a fool and a fanatic. Yet his theories became facts, facts which saved the lives of thousands of people and came to be accepted as the very foundation of the science of medicine.

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Years later a keen-minded but puzzled Dutch physician fed polished rice to fowls and watched them become paralyzed, go into convulsions, and die, just as he had watched hundreds of human beings die similar deaths. Thus it was shown for the first time that all diseases were not due to bacteria alone, but that some were due to a lack. This lack, minute in quantity, tremendous in quality, lay in the diet. Again men scoffed, laughed, remained doubting and skeptical; yet Eijkman's theories, like Pasteur's, became facts. The lives of thousands of people were again saved, and the foundations of medicine were broadened and strengthened.

A decade later, in a laboratory of one of our great universities, white rats were so inadequately fed that their eyes became sore, half closed, pus filled, and blinded. Similarly did the eyes of emaciated, war-starved Danish babies become sore, half closed, pus filled, and blinded. But the theories of Eijkman, that diseases could be caused by dietary lacks, were not yet accepted. Besides, this was familiar stamping ground: the eye infection was caused by specific bacteria. The medical men of the day put their heads together; something must be found to kill these bacteria, for more and more children were going blind. (Denmark continued to export butter and to feed her babies skim milk.) Only one thing could be found which would do the trick: proper feeding built up the tissues of the eyes to such an extent that the bacteria could no longer grow there.

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A new light was thus thrown on the treatment of infectious diseases. The more advanced thinkers, because of this, have now begun to reason as follows: colds, tooth decay, and all types of infections and diseases are possibly analogous to this eye disease. Heretofore our entire emphasis has been upon isolating bacteria, and then rendering them harmless. Yet bacteria are everywhere. Obviously it is better to build up the body to such an extent that bacteria cannot get a foothold, cannot thrive to set up their poisons which lead to illness and death.

Still, men scoff and laugh. Their scoffing and laughter are to be heard on every hand. Just as in the days of Pasteur, skepticism still reigns. Because of doubting, people make little effort to build bodies which are impregnable to bacteria. They wait until bacteria have done much harm, and then they go to their physician or their dentist and ask aid. Their foundations are not firm.

The more lasting a building one wishes to create, the deeper must be its foundations. The most magnificent structure of all, the human body, must have the best foundation which science can help us build. We must do more than merely try to kill bacteria. We must build bodies to such a degree of perfection that bacteria cannot thrive on them.

This degree of well-being is called optimum health.

Optimum health means the most perfect health which you, individually, can attain. It means ideal

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health, positive health, that far-above-the-average health.

Optimum health might be negatively defined as freedom from all diseases; not only serious diseases, but minor illnesses as well. Such abnormalities as colds, infections of any kind, constipation, nervousness, tooth decay, pyorrhea, and hundreds of others are unknown to the person who keeps himself in optimum health.

Optimum health means, of course, normal growth and development; weight which is within the average range for your height; correct posture, the entire body straight and always carried thus, unconsciously, because of firm muscle tone and vigor; appetite for all good foods; normal digestion; and regular elimination. Optimum health means hard glistening teeth which are immune to decay; firm pink gums which fit tightly around the base of each tooth; nerves which are forgotten; and energy which urges you into activity. Optimum health implies the ability to produce offspring fitted to live long; a longer-than-average life span, with a higher degree of well-being throughout.

The face itself is a mirror to optimum health: eyes which sparkle with life and are free from underlying circles; hair which is glossy with natural luster; red lips which are quick to curve into a smile; cheeks rich with color from the circulation of healthy blood; smooth skin of good turgor, with softness and evenness of texture. Such a face glows with health when it is in repose; when animated, it pictures the vivid fa-

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cial alertness, the vivacity, and the response to positive health which go hand in hand with the beauty of a healthy body.

Optimum health, which is a joy in itself, can be yours.

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Chapter 2

BUILDING RESISTANCE

There are certain body requirements which must be met daily by every man, woman, and child, if he is to possess optimum health. Whether a person is young or old, ill or in positive health, underweight or overweight, these requirements must be considered in eating three meals a day during three hundred sixty-five days of the year.

However, no one of these body requirements is more important than any other, even though one may be discussed here in greater detail than another. For example, relatively little space is given to the body's iron requirement. Lack of iron leads to one disorder, anemia. Though a person's knowledge of nutrition may be only superficial, he usually knows the result of an iron deficiency. On the other hand, a lack of any one of the vitamins leads to many disorders instead of just one. These disorders are less well known. For this reason, more space has been given to the discussion of the different vitamins. Nevertheless, the body's iron requirements are equally as important as the body's vitamin requirements.

Vitamins are chemical substances which are found in certain foods. These are not only essential to

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normal growth, but are necessary to promote health in people of all ages. The person who is already in normal health is usually rewarded by even greater vitality, higher resistance to disease, an above-the-average degree of well-being, and a longer life span when these substances are generously furnished in his diet.

When, on the other hand, these substances are inadequately supplied in the diet, certain illnesses result. For example, if the food of either animal or man is completely lacking in vitamin A, a severe eye infection, known as xerophthalmia, develops. A complete deficiency of this vitamin so rarely occurs in America that such a situation is of little interest to us. However, since the result of a complete lack of vitamin A is the same in both animal and man, it is reasonable to believe that minor deficiencies are likewise the same. Hence, much can be learned about these minor deficiencies by studying them in experimental animals.

Subtle deficiencies, that is, where almost but not quite enough vitamin A is supplied in the diet, are of tremendous importance to us. These deficiencies, which lead to minor illnesses, are of such common occurrence that few of us escape them.

It is known that when an insufficient amount of vitamin A has been included in the diet—it need not be entirely lacking by any means—certain mechanical changes take place in the body.

The body is largely lined, somewhat as a coat may be lined, with what is called mucous membrane. For example, mucous membrane lines the throat, mouth,

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nose, mastoids, sinuses, middle ear, lungs, alimentary tract, and other parts of the body. If the diet is high in vitamin A, these membranes are made up of turgent, spherical, pinkish-gray cells. These healthy cells are made self-cleansing by continuously secreting a liquid which flows over them. An example of this is the moisture which is always present in a healthy nose. There is some evidence that this liquid may even be germicidal, as though we had a weak solution of iodine pouring through our bodies. Millions of harmful bacteria find their way to these healthy cells, but are washed away or perhaps killed by the moisture itself. There is no food for them to eat. Since the bacteria cannot get a foothold, no infection is set up.

Let us suppose it is your mucous membrane which is in the condition we have just described. All winter you are exposed to colds, sinus infections, influenza, and other diseases. You know that the germs of these infections get into your nose, lungs, and throat. Still you remain healthy. We say you have high resistance to disease.

Vitamin A seems to supply the necessary substance to keep the millions of tiny cells of the mucous membranes healthy.

In individuals who eat too little vitamin A, we see an entirely different picture. The cells of their mucous membranes are no longer adequately nourished. The moisture they secreted when they were healthy is either decreased in amount or completely lacking. This liquid is also believed to have lost its germicidal ac-

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tion. The millions of bacteria which reach this membrane are now no longer killed or washed away. Gradually these cells change shape. They are no longer round or spherical, but are hard, flat, and dry. Their surface is horny and rough. Under the microscope they look something like the surface of a severely chapped hand. Bacteria are actually held there by this rough surface. They cannot get away.

But this is not all. Thousands of cells are dying; these slough off from the parent tissue. We might compare them to dandruff. These dead cells still contain a certain amount of moisture. They remain at body temperature. They contain protein, which is excellent food for bacteria. This food supply is continually replenished by other dying cells. Thus the dangerous bacteria are fed. They multiply by the billions. You know the result: pus, toxins, poisons, pain, and all too often, death.

Let us suppose that the cells in your sinus are no longer healthy, for you have been careless about eating an ample amount of vitamin A. Bacteria find their way into your sinus, perhaps from a crowded street car. They are no longer washed away as they could have been, had your diet been good. The horny, rough cells actually hold them there. Dying cells furnish them food and moisture, and your body keeps them warm. The bacteria multiply. An infection is well under way, causing you pain.

You may have the pus drained and thus relieve the pressure which causes the pain. Perhaps you

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have the sinus washed with antiseptic fluid, which kills the bacteria. Once again you feel comfortable. Frequently you wrongly say you have been "cured."

The reason you are not actually cured is this: you have not yet built up the cells to the place where bacteria cannot live on them. You must remember that bacteria are everywhere. Soon others will come to replace those you have killed. Again you have an infection. After this has happened repeatedly, your infection is said to be chronic. If you are to prevent these infections, you must build up the cells by eating generous amounts of vitamin A in order that they can wash away, kill or starve the bacteria reaching them.

Naturally it will take time for the cells to become healthy again, for during an infection millions of bacteria are tearing them down even though your body, stimulated by a good diet, is trying to build them up. Therefore, you cannot expect to cure your sinus infection immediately by eating large amounts of vitamin A.

I recall a patient who had a chronic sinus infection of twenty years' standing. This infection was so severe that he was unable to work, for he suffered constant pain. Time after time he had had his sinuses drained and washed, but without permanent relief. At the beginning of winter he began eating an adequate diet, rich in vitamin A. During that winter there was no change. By spring the infection started to clear up. During the following four years,

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or up to the present time, his infection has not returned. The cells of his mucous membranes are now able to protect themselves.

Instead of an infection in the sinus, which has only been used as an example, the bacteria may have gained a foothold in the vitamin-A-starved cells of your nose, throat, mastoids, bronchial tubes, lungs, gall bladder, kidneys, bladder, or genito-urinary tract. Perhaps the infection is in the skin, which changes much as does the mucous membrane when an inadequate amount of vitamin A is eaten. In this case bacteria may cause boils, pimples, impetigo, or other skin infections.

These changes are of such common occurrence that many such infections, most particularly colds are accepted as inevitable. And how pitifully often are these endured or even treated without the slightest increase of vitamin A in the diet!

Studies have been made of the points of infection in experimental animals, white rats, in which diets containing different amounts of vitamin A were used. In these studies it was found that the harmful bacteria were always present, whether the animals were fed little or much vitamin A. However, the animals given little vitamin A had many millions of bacteria feeding off their cells; hence, they had many infections. The animals which were fed much vitamin A harbored relatively few harmful bacteria and had no infections.

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When a small amount of vitamin A was fed, ninety-eight of the one hundred animals had some point of infection. In a similar group of one hundred animals given a large amount of vitamin A, not one showed any infection whatever.

In a study of young animals on diets adequate in all other respects except for vitamin A, the following percentages of infections were found:

skin abscesses	90
eye infections	88
bladder and kidney infections	44
sinus infections	20
mastoid infections	20
lung infections	9

In a study of sixty-four children who suffered from xerophthalmia, the disease which results from a complete deficiency of vitamin A, the percentage of infections was similar to that above:

eye infections	100
pyelitis, or kidney infections	27
pneumonia	15
skin abscesses, carbuncles, boils	14
mastoid infections	13
bronchitis	12

The majority of children who suffered from xerophthalmia died, not from the eye infection, but from pneumonia starting with bronchitis.

True, these figures show infections which have accompanied the complete deficiency of vitamin A rather

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than the subtle lack in which we are most interested. However, they undoubtedly throw some light on the origin of these abnormalities which we see all too often.

When the life span of experimental animals is compared to that of human beings, it is found that similar infections appear at comparatively the same time in the life of each. For example, young animals, like young children, are more susceptible to mastoid infection than are older ones. A lung infection, which is very similar to tuberculosis except that the bacteria are different, appears at what would be, for the animal, the teen age or early twenties. Similarly, bladder and kidney stones appear in the older animals, just as they do in older human beings.

A deficiency of vitamin A has so consistently led to infections throughout the body that it is frequently called the anti-infective vitamin. This term is inappropriate because it leads to two erroneous conclusions: first, that lack of vitamin A is the sole reason for infections; second, that the building of resistance is the only function of this vitamin.

Vitamin A is needed by the body in many more ways than in preventing the cells from inviting bacterial invasion. It is essential to the normal development of bones, to good appetite and normal digestion, to reproduction and lactation, to the formation of both red and white corpuscles in the blood, and to longevity.

Another abnormality has recently been shown to be due to the lack of vitamin A. In a study of several

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hundred experimental animals, white rats, which were kept on diets low in vitamin A, stones developed in the gall bladder, kidneys, and bladder. If the A-deficient diet was fed over a long enough period of time, 100 percent of the animals developed stones in kidneys and bladder, while a somewhat smaller number had stones in the bile duct. The sizes of these stones were studied by means of x-ray and autopsy. The diet of the living animals was then changed to one of high vitamin A; the stones were found to decrease slowly in size and gradually to disappear.

Whether or not this treatment can be applied to human beings as a curative is not known. However, it emphasizes the need of eating generous vitamin A as a preventive step. A urologist recently told me of a patient from whom he removed large kidney stones. In less than three months the patient returned with still larger stones than those already removed. "We must," this physician said, "find something other than operative procedure in our treatment of stones."

Similarly, it has been found that animals lacking vitamin A have large stones in the pulp or nerve chamber of the teeth. These are called pulp stones. In human beings these stones crowd out and kill the nerve of the tooth. Animals on low vitamin A also show heavy deposits of tartar or calculus on their teeth; in some cases the teeth are almost covered. Conversely, the teeth of animals adequately fed show neither pulp stones nor tartar deposits. It has also been shown that if people who have heavy tartar deposits on their teeth

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eat an adequate diet high in vitamin A, no more deposits will be formed.

Theory has it that these stones and calculus deposits are formed because the cells of the mucous membranes, during a deficiency of vitamin A, are continuously sloughing off. These dead cells offer no danger to the proper functioning of the body if they come from open membranes, as in the mouth or throat. However, in the glands or organs which are connected with other parts of the body by ducts or small canals, these dead cells threaten to block the way, thus preventing the flow of secretion. For example, if enough dead cells sloughed off in a salivary gland, saliva from the gland might be prevented from flowing into the mouth. The body, therefore, deposits mineral salts on these dead cells, making them compact, hard, and heavy enough to be carried away in the secretion of the gland. We know that the body throws off many small stones from the bladder and kidneys in the urine. We also know that tartar collects on the teeth at the outlet of the salivary glands.

Experimental animals on adequate diets high in vitamin A are normal and healthy in every respect. It is reasonable to believe that human beings could likewise avoid many illnesses if vitamin A were more generously supplied in their diets.

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Chapter 3

VITAMIN-A REQUIREMENTS

Many fruits and vegetables contain a bright-yellow coloring pigment known as carotene. When this is eaten by a living creature, it is apparently changed by the liver into vitamin A. Many yellow foods such as carrots, apricots, yellow peaches, yellow melons, and sweet potatoes contain fairly large amounts of vitamin A in the form of carotene.

However, the bright-green foods such as spinach, broccoli, green peppers, and mustard greens contain the richest supply of vitamin A in the vegetable kingdom. Animals eat alfalfa, grass, and other green plants which are rich in carotene; so it is that liver, kidneys, egg yolk, whole milk, cream, butter, cheese, and fish-liver oil contain vitamin A proper, after it has been changed from carotene by the animal's body. Of these, fish-liver oils are by far the richest source.

On the other hand, fruits and vegetables which are not and never have been green or yellow contain little or no vitamin A. Examples of these foods are pears, apples, white potatoes, cauliflower, eggplant, lima beans, dry white beans, beets, turnips, bleached or white celery, and bleached asparagus. Sugar, nuts, vegetable oils, syrup, and most cereals other than yellow

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cornmeal likewise contain little or no vitamin A. Barring liver and kidneys, meats are almost entirely deficient in this vitamin.

You should eat spinach, broccoli, carrots, and other vitamin-A-carrying vegetables more frequently than turnips, cauliflower, and beets. Use more apricots, yellow peaches, green gage plums, and prunes than apples and pears. Buy green lettuce, green asparagus, green curly cabbage, and unbleached celery rather than the lighter or the bleached varieties. Serve sweet potatoes or yams more often than white potatoes. Occasionally substitute liver, kidneys, cheese, or an egg souffle for roasts, chops, and steaks. Add sour-cream mayonnaise to the salad instead of oil dressing. Buy storage eggs and butter which have been produced when the grass was green rather than the fresh, winter products. By choosing such foods, you can increase your vitamin-A intake tremendously.

If you plan carefully, even though you spend the same amount of money each time, you can probably buy fifty times more vitamin A this week than you did last.

Your first reaction is likely to be that you get these foods almost daily. But how much do you get? I have had several hundred people check the amount of vitamin A they have eaten in a given day and have found these amounts to average about 2000 units per day. While the exact number of vitamin A needed by each person is not known and indeed varies with each individual, it is known that by eating carefully planned

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meals, 60,000 to 100,000 units of vitamin A can be taken by one person in the course of a day. That is, from thirty to fifty times more vitamin A could be eaten than generally is eaten. Moreover, all of this amount can be furnished by such simple foods as liver, cream, butter, cheese, spinach, carrots, sweet potatoes, and perhaps a dessert of apricot pie.

All too frequently people accept as an interesting scientific fact the rule that brightly colored foods contain more vitamin A than do colorless ones, but they usually fail to apply it in their daily lives. How often do white potatoes, white bread, refined cereals, bland puddings, apple sauce, steaks, gravy, and sweets appear on your table day in and day out, making up the larger part of your menus?

Some time ago a nine-year-old boy with numerous vitamin-A deficiencies, such as anemia, boils, constant colds, severe sinus infection, possible tuberculosis, and subnormal growth, was brought to me for dietary supervision. The mother knew that at each meal the child should get just as much vitamin A as it was possible to give him. One night I had dinner with this family. The meal consisted of pork roast, brown gravy made with water, baked potatoes, cauliflower, white bread, tea, and cake. Judged by the standards of palatability, the meal was excellent, and yet it offered almost no vitamin A whatever to the child whose future health was probably already impaired. How pitifully typical is such an example as this!

If the body is given a generous amount of vitamin

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A, more than it needs at one time, this vitamin is stored in the liver, and to a lesser extent, in the lungs and kidneys. Such storage is made possible by the fact that vitamin A is soluble in fat, which is normally stored in the body. If this supply is not used up, it may be kept over a relatively long period. From studies of experimental animals, it appears that if a child is fed very large amounts of vitamin A before he is three years old, he will be less susceptible to the usual children's diseases even when he is ten or twelve years old. In other words, if during the years from three to ten the child is fed enough vitamin A to furnish his daily needs, then the ample supply will remain stored away until a time of special stress. In this way the body builds up its resistance against disease and protects itself against any period of dietary insult.

The time is past when one can intelligently believe that it is just a chance that causes one person to die of pneumonia or to contract tuberculosis, while another remains well. During the war men stood side by side, undergoing the same hardships and exposure. The health of many broke; that of many others remained sound. If we judge from scientific work on experimental animals, we are tempted to believe that some had greater stores of vitamin A in their bodies than had others.

The body cannot store what it is not given. Many people probably eat just enough vitamin A to promote growth after a fashion, though some are stunted; just enough to prevent the most severe infections.

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No surplus has been given the body; consequently the liver, like the liver of an experimental animal whose diet has lacked vitamin A, has none to put away for a "rainy day." These people have little hope of coming through a severe infection victorious. It is so easy to believe, particularly when one is young and should be laying away a supply of vitamin A, that death will always get the other fellow and give one's self the go-by.

It has been found that if very generous amounts of vitamin A are given experimental animals, these animals store eighty times more of this vitamin than is necessary to allow them normal growth and development and to keep them free from all infections. Nature rarely stores any substance needlessly.

It has been found in experimental animals that the larger the animal, the more vitamin A it needs, although it needs proportionately greater amounts during growth. We are thus led to believe that adults need more vitamin A than children. Here in America we give cod-liver or halibut-liver oil to babies, but as the children become larger, even though they may still be growing rapidly, the oil is usually not given them. The greater percent of adults, who are larger still, get none at all.

Cod-liver oil, cod-liver-oil concentrates, and halibut-liver oil are put up in palatable tablets and capsules for the use of anyone who finds the oil distasteful. All of these are sold at drugstores.

One tablespoonful of cod-liver oil or its equivalent

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has been popularly used as standard dosage, although those who suffer from vitamin-A deficiencies are wise to take three or four tablespoonfuls or an equivalent daily. For those who seem to be in excellent health, one tablespoonful of the oil or its equivalent is possibly sufficient. Since these are foods and not medicines, they can be taken at any time of day.

People are always asking me, "How long should I take fish-liver oil?"

My answer always has been and probably always will be, "Just as long as you are interested in your health."

You must not feel that the oil furnishes all of your vitamin-A needs. In the long run, your greatest amount must come from your commonly used foods. There will be days, however, when you will have few foods naturally rich in vitamin A; thus the oil should be taken. The wise person sees that his daily vitamin-A intake is just as high as he can possibly make it.

The oil may seem expensive, but it is extravagant economy to try to save money on food which builds health.

Summary of Vitamin A

Functions in the body: maintains health of mucous membranes; builds resistance to disease; promotes growth; maintains health and vigor; stimulates appetite and digestion; is essential to reproduction and lactation.

Results of a deficiency: lowered resistance to disease; retarded growth and development; anemia; stones;

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susceptibility to infections of sinuses, mastoids, eyes, nose, skin, throat, bronchial tubes, lungs, kidneys, bladder, gall bladder; decayed teeth and calculus deposits on teeth.

Sources: cream, butter, cheese, whole milk, fish-liver oils, egg yolk, liver, spinach, carrots, watercress, escarol, apricots, green peppers, tomatoes, prunes, yellow peaches, Persian melon, cantaloupe, sweet potatoes, yams, broccoli, other green and yellow foods.

Solubility: in fat; permits a surplus to be stored in the body.

Stability: harmed by oxidation and cooking.

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Chapter 4

OUR CHANGING DIET

People frequently ask, "If vitamins are so important, how did our grandparents get along so well without knowing anything about them?"

Our grandparents ate an entirely different diet from that we eat today, and in some respects a better diet than ours now. In the first place, they did much more hard physical work than we do; therefore, they had to eat larger quantities of food. As a result, their total intake of minerals and vitamins was much higher than ours. We have now arrived at the stage where many people need such a small amount of food, because of limited exercise, that their food must be chosen with utmost care in order to include even minimum body requirements.

Our grandparents ate smaller amounts of sweets than we do. The consumption of sugar alone has increased almost one hundred pounds per person per year in the last hundred years. Sweets take away the appetite for the good foods which our bodies need. Fruits and vegetables were less abundantly produced or canned, nor were they sold as inexpensively as

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they are now. This lack of fruits, vegetables, and sweets caused our grandparents to eat much larger amounts of breads and cereals in order to satisfy their appetite and to furnish heat and energy than we eat. They had neither an interest in reducing nor a vogue of eating only foods which produce an alkaline ash in the body; thus again they ate more grain products than we. The grains at that time were milled in such a way that the germ and part of the bran remained in the flour and cereals. Now they are "refined."

So it is that the national diet has changed. In many respects it has improved, but in one respect it has been tremendously impoverished. An adequate supply of vitamin B, which is so necessary to the health of the nerves, to normal digestion, and to proper elimination, has almost become a thing of the past. With this decrease in the vitamin-B intake has come a corresponding increase in many diseases which were almost unknown to our grandparents.

The embryo or germ of grain is one of the richest known sources of this vitamin. Our grandparents ate large amounts of the germ; the average person of this generation never heard of it.

Let us look at a table of the richest sources of vitamin B which can be obtained for our daily use. These are given in approximately equivalent amounts. For example, one tablespoonful of wheat germ is approximately equivalent in vitamin B to that in an entire loaf of wholewheat bread.

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Foods Yielding Approximately Equivalent Amounts of Vitamin B

1	tablespoon of wheat germ
$\frac{3}{4}$	tablespoon of brewers' yeast
10	tablespoons of malt
$\frac{3}{4}$	cup of bran
$\frac{1}{2}$	cup of whole buckwheat
1	cup of buckwheat flour
$1\frac{1}{2}$	cups of whole barley
18	slices of whole-wheat bread
16	slices of rye bread
2	cups of raw brown rice
2	cups of rye flour
$2\frac{1}{4}$	cups of raw oatmeal
2	cups of whole-wheat cereal without the germ

As cereals to which wheat germ is added vary so much in percentage of wheat germ contained, it is impossible to give their equivalent amounts of vitamin B.

Malts have long been used therapeutically. Also yeasts in home-brewed drinks were recommended to relieve constipation and to stimulate lactation in nursing mothers generations before their vitamin content was appreciated. Whole cooked buckwheat, or kasha, was a popular dish in old Russia. I am told that peasants for many generations had eaten kasha to cure intestinal disorders.

Minute amounts of vitamin B are to be found in many foods, but these amounts are too small for the

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foods to be considered good sources. When some of these foods are dried, as powdered liver, dried egg yolk, and concentrated spinach, thus eliminating their high water content, they become excellent sources, but these are rarely used. From six to thirty pounds of most vegetables are required to equal one tablespoonful of wheat germ in vitamin B. No vegetable, therefore, can possibly offer an adequate daily supply.

The only significant sources of vitamin B in the American diet are whole-grain breads and whole-grain cereals, and the small quantity of yeast which is used. Frequently people use only the refined white products, or eat small amounts of breads and cereals of any kind.

However, the appearance of prepared whole-grain cereals on the market has been some improvement. These are important sources of this vitamin, although, due to different methods of preparation, their potency cannot be given here. Bran ranks among them as one of the richest sources of vitamin B commonly used. It has long been known to relieve constipation. Since it is not unusual for people to have adhesions, kinks, restrictions, and other structural abnormalities in their intestines, causing the bran to back up or pack tightly together rather than to pass through the body, bran is somewhat a dangerous product to use without complete physical examination.

One glance at the table shows that wheat germ and brewers' yeast are by far the best source of vitamin

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B, being many times richer than those sources commonly used.

Brewers' yeast is put up in both powdered and tablet form and is sold at drugstores. I do not refer to compressed yeast cakes, for at this writing (1935) they have no standardized vitamin content. A thousand yeast tablets of known vitamin content can be purchased for from four to seven dollars, while a thousand yeast cakes cost between thirty-five to fifty dollars. Yeast tablets offer an excellent source of vitamin B to people who are reducing, traveling, or eating in restaurants.

Wheat germ is the part of the wheat from which the sprout appears. It can be obtained directly from any flour mill and is now sold at many groceries and drugstores. It may be cooked three to five minutes and served alone as a hot cereal, or can be added to any hot cereal. Wheat germ may be served raw with fruit, eaten as a cold cereal, added to meat loaf, or taken in orange juice or milk. By replacing one-half or more of the flour in any good recipe with wheat germ, you can make delicious hot cakes, waffles, nut bread, cookies, gingerbread, and spice cake. Very palatable hot cakes and muffins can be made entirely of wheat germ.

I usually recommend wheat germ as a source of vitamin B for several reasons: with flour mills from coast to coast, it can be obtained by everyone; it is the most inexpensive source on the market at the present time; it is accepted as food more readily than

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yeast, since tablets are often associated with medicine; and it can be used daily in a variety of ways year in and year out without one tiring of it.

There are, of course, many other products sold at drugstores which contain vitamin B. These are made of wheat germ or yeast or of both, and are sold under various trade names. These are invariably too expensive to be used generously by everyone.

Vitamin B is somewhat hurt in cooking. Just how much of the vitamin is killed depends upon the temperature and the length of time of cooking. Short cooking at a high temperature is to be preferred to long, slow cooking. However, it is probable that not all of the vitamin is killed in the usual cooking time.

The exact amount of vitamin B needed by any person is not known. However, even extremely large amounts are not harmful. One tablespoonful of wheat germ or its equivalent daily seems to be a satisfactory amount for a normal, healthy individual. On the other hand, I have often recommended an entire cup of pure bran-free wheat germ daily to patients with disorders of the intestinal tract. Like other vitamins, comparatively larger amounts are needed during growth, although actually larger amounts are needed by adults. This vitamin is needed by any person in proportion to his muscular weight. A slender man weighing 160 pounds would need much more vitamin B than a woman of the same weight who carries some forty

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pounds of fat on her body. Also, vitamin B is needed in proportion to the amount of exercise taken. A person who works under pressure, often going on sheer "nervous energy," needs many times more vitamin B than the placid, relaxed individual. Considering this and speaking generally, it is safe to say that men need more vitamin B than women. As far as is known, a mother wishing to nurse her baby needs a more generous amount of vitamin B than any other individual. Foods rich in vitamin B should be eaten daily throughout pregnancy because of its stimulating effect upon the growth of the mammary glands. The widespread lack of vitamin B is undoubtedly one of the reasons for failure to produce mother's milk.

Vitamin B is soluble in water. Since water is not held in the body for any length of time under normal conditions, vitamin B cannot be stored; therefore, it must be adequately supplied daily if you are to reach optimum health.

It is wise for any family, regardless of how healthy, to keep wheat germ in the house to be used as a cereal and in whatever baking is done. Whole-grain breads and cereals should be used to the exclusion of all others except when advised otherwise by a physician. Whatever your source of vitamin B, be conscientious about seeing that the supply is ample for every member of your family, from the two-weeks-old baby to the eighty-year-old grandmother.

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Chapter 5

THE NEED OF HEALTHY NERVES

Vitamin B is perhaps the most important single factor in building and preserving the health of the nerves throughout the body.

In the United States few other single factors have led to so many subtle ailments as has the deficiency of vitamin B. One scarcely meets a person who does not suffer from one or more of these ailments. However, in our country we do not have dire deficiencies of this vitamin, that is, deficiencies sufficiently severe as directly to cause the death of hundreds of people from beriberi, a condition which has long existed in the Orient. Nevertheless, of the two, the subtle deficiencies are really the more serious, for they are rarely recognized and treated as such.

People who are in optimum health are scarcely aware that they have nerves in their bodies. It is only when these nerves become improperly nourished that one realizes all too well the importance of keeping them healthy. Unfortunately, almost our entire adult population, and many thousands of our children as well, could be said to be nervous. This condition should not be accepted as inevitable or excused as a result of

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the fast pace of modern living until the vitamin-B deficiencies of our national diet are overcome.

However, nervousness in itself is only one result of a diet too low in vitamin B, and usually it is not the most serious. The entire digestive tract is controlled by nerves, which, if functioning normally, command the muscles in the walls of the stomach and intestines to work efficiently.

Vitamin B stimulates the appetite indirectly by controlling the health of the nerves. Healthy nerves command the muscles in the walls of the stomach to contract vigorously at frequent intervals. When the stomach is empty, these contractions set up slight pains, known as hunger pains. But the sluggish vitamin-B-starved nerves can no longer command these walls to contract, and the person whose diet is deficient in this vitamin does not get hungry.

As a result we hear mothers all over the country say, "My child won't eat!" When generous amounts of vitamin B are added to the child's diet, his appetite is restored. Likewise, there are thousands of under-weight adults whose lack of appetite causes them to be indifferent to the foods which are so essential to the building up of their bodies.

A normal person swallows a fairly large amount of air in the course of a day. This either escapes by mouth or passes so quietly through his body that he is rarely aware that he has swallowed any air at all. On the other hand, a nervous person swallows four or five times as much air as does a normal person. This air or

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"gas" may give the sensation that the stomach is pressing against the heart, frequently making the patient think he has heart trouble.

Perhaps the air escapes, causing annoying belching. At the same time, some of the hydrochloric acid from the stomach may be brought part way up the esophagus, causing a mild irritation. The person thus suffers from what he calls, for some unknown reason, heartburn. He may get a slight taste of the acid and thus believe he has "sour stomach."

The sufferer tries to analyze, out of the previous meal of a number of foods, which food has caused the trouble. He is, of course, convinced that the "gas" comes from food, because he has never thought of the possibility of his swallowing air. Usually it is the food which has the most distinct flavor, such as onions, cabbage, green peppers, radishes, and the like, which he decides upon first because he can taste them every time he belches. Hence these foods are eliminated from his diet, and he will say that they do not agree with him. As time goes on, other foods, and invariably those which are most essential to health, are likewise eliminated from his diet.

Such a person's total intake of vitamins and minerals is so decreased in time that he runs the risk of suffering multiple deficiencies. He may eliminate his fuel foods and become underweight. On the other hand, since fats and starchy foods have less distinct

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flavors than have meats and vegetables, he may eat them almost entirely and become overweight.

Someone recommends that the sufferer take soda, which he does. This causes the formation of gas. The cardiac sphincter, a little trapdoor at the top of the stomach, opens, and the gas escapes, together with the swallowed air. The person feels so relieved that he continues to take soda every time he feels gas in his stomach, often as frequently as once or twice daily. The soda, however, must be neutralized. Therefore, he loses large amounts of the valuable hydrochloric acid in the stomach, which is frequently already under-supplied. It has been found that soda greatly decreases the digestion and absorption of foods.¹ Although the person gets relief from air or gas distension, his actual condition gradually becomes worse, and his chances of having more serious digestive disturbances are greatly increased.

The air swallower often suffers from gas pain directly after a meal. Though there are many gases formed in the normal digestion of foods, these are freed in the intestines rather than in the stomach, and rarely sooner than seven to nine hours after eating. These gases are largely absorbed into the blood stream and are expelled with exhaled air. The blood, however, cannot pick up swallowed air. Air is 20 percent

1 Childrey, Alvarez and Mann. Digestion. Arch. Int. Med. 46, 361-374 (1930)

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oxygen; the blood is already saturated with oxygen. Furthermore, nitrogen, the other 80 percent of air, is the most insoluble of all body gases. If this swallowed air has not escaped from the stomach, it passes on into the intestines. Here it often accumulates in amounts large enough to distend some portion of the intestines, cause kinks, and set up severe pain.

A very large percent of the indigestion suffered today is nothing more than swallowed air. Air swallowing is due to improperly nourished nerves, and should be treated by foods which can build healthy nerves. The person who suffers from gas pain should eat a diet rich in vitamin B, and avoid taking soda, which can do much harm and at best gives only temporary relief.

Vitamin-B-starved nerves, in addition to causing lack of appetite or excessive air-swallowing, can no longer command the muscles in the walls of the small intestines to work normally. The food mass remains in the intestines longer than it should. Millions of bacteria breed upon it. Some of these bacteria, the undesirable variety, break down such foods as eggs and meat, and form many odoriferous gases. One of these gases, hydrogen sulfide, is popularly distinguished as the odor of rotten eggs. This particular gas is many times more soluble in blood than is oxygen, and is readily picked up and exhaled from the lungs. This is one of the physiological bases for halitosis. The person who suf-

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fers from halitosis of this type is wise to eat a diet rich in vitamin B.

Sluggish, unhealthy nerves which cannot command the muscles in the walls of the intestines to work properly thus allow the waste material to remain in the colon and rectum until it is hard and dry. So it is that a slight vitamin-B deficiency leads to constipation. Since proper elimination is of such vital importance to health, it is discussed fully in another chapter.

Nervousness, lack of appetite, air-swallowing, halitosis, and constipation are symptoms of a mild vitamin-B deficiency. The seriousness of this deficiency lies in the fact that, if not corrected, it may lead to conditions dangerous to health.

Millions of bacteria breed on the food mass which is allowed to remain in the intestines. There is a dirty alimentary tract throughout, from an unclean mouth to putrefaction in the colon. These bacteria enhance the danger of such infections as tooth decay, infected gums, ulcers, colitis, and appendicitis.

If the diet is not corrected by the addition of large amounts of vitamin B, the condition grows worse. The nerves in the walls of the intestines become more sluggish, the muscles lose their tone, and diarrhea results, or alternating diarrhea and constipation. The intestinal walls often becomes worn, thin, and ulcerated. Mucous and blood are often passed in the stools. This condition, known as colitis, is now successfully treated by giving the patient large amounts of vitamin B.

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Due to the thin, worn, and perhaps broken walls found in the intestines during such conditions as colitis, the bacteria can pass directly into the blood and lymph streams and be carried to other parts of the body. Thus, during a deficiency of vitamin B, there is a greater susceptibility to infections throughout the body, just as when inadequate amounts of vitamin A are eaten, though for an entirely different reason.

The weak muscle tone of the digestive tract, which results from a diet poor in vitamin B, leads to many abnormalities. It may cause sagging or displacement of the stomach or intestines. Nervous irritation may cause pinching of the muscles in one part of the intestines, known as spastic constipation. Again, poor muscle tone, together with gas distension, may cause a large bulging of some portion of the intestine, known as atonic constipation. Lack of vitamin B may not be the only cause of these abnormalities, but it undoubtedly is an important causative factor.

Experimental animals whose diets have been adequate in other respects, yet lacking in vitamin B, often show broken places or sores in the walls of the stomach and intestines, comparable not only to those of ulcerative colitis but also to duodenal and stomach ulcers. In actual practice, the conventional diet given for either of these types of ulcers is so deficient in vitamin B that people living on them for a long time have been known to develop beriberi, the disease specific for a complete lack of vitamin B.

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Likewise, experimental animals adequately fed except for vitamin B show distended and infected appendixes. What bearing this may have on appendicitis in humans is not known. It may be well to remember that the picture of a vitamin-B deficiency frequently precedes appendicitis and also that appendicitis has increased tremendously since the germ of the grain has been removed from flours and cereals. A recent medical journal stated that appendicitis was so rapidly increasing that every twenty-six minutes someone in the United States dies from it.

Experimental animals fed inadequate amounts of vitamin B have enlarged hearts. Heart disease accompanies the so-called wet beriberi, together with edema, or swelling of various parts of the body. This storage of water is explained theoretically by the fact that vitamin B is water-soluble and that the body thus attempts to hold its limited supply of this vitamin.

Deaths from heart disease have also increased tremendously since our grandparents were children. The writer of an article published in a recent Journal of the American Medical Association stated that a large amount of the heart disease seen today in America was undoubtedly due to the widespread lack of vitamin B.

The entire story of the influence of vitamin B upon health is by no means yet complete. It has been found that high vitamin-B foods are helpful in the

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treatment of diabetes, pernicious anemia, neuritis, paralysis, and certain types of mental and nervous disorders. There is some scientific evidence that lack of vitamin B has been a causative factor in bringing about many of these abnormalities. Again it must be recognized that many of these diseases have increased during the last two generations. The beneficial effect of vitamin B generously supplied in the diet is undoubtedly more far reaching than we have as yet come to appreciate.

The person who suffers from any abnormality mentioned here is indeed wise to see that vitamin B is amply supplied in his diet. It is still more important—more important because it fortunately applies to a larger number of people—to see that your diet contains adequate vitamin B every day, not only in order that certain diseases can be prevented, but that you can build to optimum health.

Summary of Vitamin B

Functions in the body: stimulates appetite; aids digestion; improves assimilation of foods; builds health of nerves; protects the body from nerve diseases; essential for normal reproduction; stimulates lactation; promotes firm muscle tone throughout the digestive tract.

Results of a deficiency: impairment or loss of appetite; poor digestion; constipation; incomplete absorp-

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tion of food; decrease in milk production in nursing mothers; loss of weight and vigor; nervousness; colitis; certain types of neuritis; lower resistance to disease; abnormalities and diseases of the digestive tract; possibly certain types of heart disease and appendicitis; gradual paralysis of limbs in severe cases.

Sources: wheat germ, brewers' yeast, rice germ, brewers' rice, whole-grain breads, whole-grain cereals, prepared cereals, bran, malt.

Solubility: in water; prevents storage in the body; allows loss when water in which foods have been cooked is thrown away.

Stability: harmed by long cooking; only slightly harmed when foods are cooked a few minutes; destroyed rapidly when foods are reheated.

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Chapter 6

HEALTHY CONNECTIVE TISSUES

The human body is made up of billions of cells, just as a brick building is made up of perhaps as many bricks. Without cement, these bricks would fall apart. Similarly, the function of vitamin C in the body appears to be the cementing together of all the body cells.

In the human body, some of the smallest bits of cement, or connective tissue, are found between the cells of the tiny capillary walls. Therefore, when vitamin C is inadequately supplied, these capillary walls are among the first to break down. The capillaries which are nearest the surface, hence most easy for you to see, are those in the gum tissue. So it is that you often have your first evidence that the body's connective tissues are weak when your gums begin to bleed.

Perhaps before this time, all of the millions of cells in your gums had been perfectly healthy. You became careless about drinking your orange juice daily, the connective tissues became weak, and the walls of the capillaries broke. The blood from these capillaries escaped, never reaching the cells which depended upon them for nourishment. The cells starved for want of oxygen and food. Like the vitamin-A starved cells,

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these dead cells are still warm and moist, and contain excellent food for bacteria.

The average person has from eight million to two hundred million bacteria in one teaspoonful of saliva. Consider how many teaspoonsfuls of saliva pour through the mouth in the course of the day. In a clean healthy mouth many of these bacteria die because they can find no food to live upon. But when your diet lacks vitamin C, you give them millions of warm moist dead cells to feed upon.

Again, as in deficiency of either vitamin A or B, infection sets in, although this is due to an entirely different reason. This time the cells are starved because their supply wagon, the blood, stalled on the way. The bacteria live on these cells and rapidly multiply; poisons, toxins, and pus are formed. This infection may be called gingivitis, meaning merely an infection of the gums. If particular types of bacteria are involved, it may be diagnosed as Vincent's infection, or trench mouth. If the infection is accompanied by certain changes in the bones of the mouth, it is called pyorrhea. So it is that lack of vitamin C leads to unhealthy gums.

There is still less connective tissue in the dentine of the teeth than in the capillary walls. The dentine makes up the larger part of the tooth, and is found between the enamel covering and the pulp or nerve chamber. This dentine is largely mineral salts, calcium, and phosphorus, held there by tiny bits of connective tissue. Throughout the dentine seeps a certain amount

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of moisture, or lymph. When vitamin C is inadequately furnished, the connective tissue of the dentine breaks down, freeing some of the mineral salts. The continuous filtration of lymph picks up infinitesimal particles of calcium and phosphorus, known as ions and molecules. The lymph removes these ions and molecules, which are carried to other parts of the body and eventually excreted in the urine and feces. The dentine, because of this loss, becomes porous and soft. In case the tooth is protected from without so that the enamel does not decay, perhaps little harm is done to the tooth itself. However, if the enamel of the tooth does decay, the dentine offers little resistance to invading bacteria. Quickly the infection spreads throughout the tooth, and reaches the pulp or nerve. For this reason vitamin C is very necessary to the building of immunity against decay.

Vitamin C also has a direct influence on the bones. When bones are burned, minerals are left. When bones are put into acid, the minerals are dissolved out; there remains a brown, flexible, cartilage-like substance, which is the connective tissue. It can be seen that bones are made up chiefly of minerals, which give them rigidity, and connective tissues, which hold them together.

Like the inside of the tooth, the bones are kept moist by lymph which continuously passes through them. A deficiency of vitamin C causes the connective tissues of the bone to break down. Freed mineral matter is dissolved in the liquid, or lymph, as easily as

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salt or sugar is dissolved in water. These minerals also are carried away by the lymph. Though this action goes on in all the bones in the body, you are likely to notice it only in the mouth. The teeth become slightly loose; x-rays of the jaw bones show that they are beginning to be absorbed. It then becomes impossible for them to hold the teeth as tightly as they once did. This process is undoubtedly one of the causes of systemic pyorrhea.

If high vitamin C is put back in the diet at this time, the gums become healthy, and the minerals are once more laid down in the bones and teeth. Though the loosened teeth will become tight again, they may have moved during the interval on low vitamin C, and from that time on they are likely to be crooked.

People often consider it of little importance that gums bleed only slightly or occasionally. Bleeding gums give you a warning of utmost importance. They indicate that capillary walls throughout the body are breaking down—in the muscles, in the vital organs, in the intestinal walls, in the bone marrow. They indicate that dentine is being weakened; they tell you that bone is being destroyed throughout the body; and best of all, they are telling you that you can still save your teeth if you will eat an adequate diet.

Gums, being made of the same type of tissue as the palm of the hand, can become toughened or "calloused" by hard brushing. In this case a slight vitamin-C deficiency does not cause them to bleed, and they are unable to act as a warning to you. However,

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we see another evidence of a subtle vitamin-C deficiency in bruises. When the skin receives a blow, the tiny capillaries underneath do not break if enough vitamin C has been included in the diet to form strong connective tissues in the capillary walls. However, if vitamin C is low in the diet, the capillaries are easily broken. Tiny hemorrhages result. It is the stagnant blood from these hemorrhages which we call a bruise. The person whose diet contains ample vitamin C rarely bruises. Bruises, like bleeding gums, should be considered a warning to increase the amount of vitamin C in your diet.

In experiments on guinea pigs, wounds were made which involved both muscle and bone. If the diet was high in vitamin C, these wounds healed quickly; conversely, when the diet was deficient in vitamin C, the wounds did not heal. A similar condition existed during the World War when the inadequate amount of vitamin C in the soldiers' food caused wounds to heal extremely slowly. In such cases, new connective tissues had to be formed, and they could not be formed without adequate vitamin C. In the healing of broken bones, wounds, and ulcers, and indeed in any instance where healing is desired and new connective tissues must be formed, vitamin C should be kept high in the diet.

All the conditions presented thus far can be corrected if sufficient vitamin C is added to the diet. Now let us see what happens if these conditions are not corrected.

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Let us suppose that a person with a mild case of systemic pyorrhea ignores the danger signals. He adds no vitamin C to his diet. As time goes on, more and more capillaries in his gum tissues break down. Now, instead of a few starved cells he has thousands of these dead cells throughout his gum tissue. Daily the bacteria which live on these dead cells multiply by the millions. The infection spreads, and the gums become pus laden. Pyorrhea pockets, filled with pus, form around the roots of the teeth. The connective tissues in the bone continue to be broken down. Minerals are liberated and carried away. As the bone is destroyed, the gums recede, exposing a portion of the roots of the teeth. The teeth become more and more loose. Again the teeth are x-rayed. This time the x-ray shows the jaw bone just touching the roots of the teeth in a few places. Some of the teeth are held in the mouth only by the infected gum tissue. The infection has got out of control. The teeth, even though they may be entirely free from decay, must be extracted. False teeth, which are undeniably an inadequate substitute, must take the place of the teeth you might have saved, had you only watched your diet.

A dentist recently said to me, "You can preach diet to some patients until you are exhausted, and they will do nothing to save their teeth. If they could only see that it is the difference between watching their diets now or losing their teeth later, they might do something about it."

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Pyorrhea seems to be a mild vitamin-C deficiency which has gone on over a long period of time, and not a dire or complete deficiency. A complete deficiency of vitamin C leads to scurvy in both experimental animals (guinea pigs) and in human beings. In this disease there is rapid destruction of bone, the teeth fall out, and hemorrhages occur throughout the body. If vitamin C is not added to the diet, death results. In scurvy, the changes occur in the mouth much more rapidly than in pyorrhea. However, if animals (guinea-pigs) are given almost enough but just slightly below the ideal amount of vitamin C daily, an infection strikingly similar to human pyorrhea develops in the course of nine months. In comparing this animal's life span to that of human beings, nine months is equivalent to forty years. It is estimated that 90 percent of all people in the United States over forty years old suffer from pyorrhea.

X-rays show that, in the case of systemic pyorrhea, the bones of the jaws have become surprisingly decalcified. Were other bones throughout the body to be x-rayed at the same time, they would show destruction corresponding to that in the jaw bones. The bones are brittle and frail. Is it any wonder then that older people, many of whom have long since lost their teeth from pyorrhea, break bones with each slight fall? Bones which break easily are not necessarily confined to older people, but they are largely confined to people whose vitamin-C intake has been too small.

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Again, in the case of inadequate vitamin C, the body's resistance to disease is lowered. The bacteria of the mouth have direct access to the blood stream. They can thus be carried to other parts of the body, dropped off through other broken capillaries, and left to start infections. Wherever there are broken capillaries, there are starved cells for bacteria to feed upon. The tremendous number of bacteria involved in such infection as pyorrhea throw off large amounts of harmful toxins and poisons which can also be carried by the blood throughout the body. How frequently such conditions as arthritis, rheumatism, ulcers, eye infections and many others accompany infections of the mouth!

Recent research indicates that lack of vitamin C is one of the causative factors in arterial sclerosis or hardening of the arteries. Supposedly what happens is this: the connective tissues in the walls of the veins and arteries weaken, just as do those in the walls of the capillaries. If these break, hemorrhage would result, causing death. The body therefore attempts to strengthen these walls by laying down mineral salts. Since there is greater pressure on the walls of the arteries, larger deposits of minerals are laid down in them than in the veins. This causes the arteries to be more brittle and less flexible. Sudden exercise, particularly if accompanied with high blood pressure, can easily lead to fatal hemorrhage. If this does not happen, the artery of the heart may eventually become

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calcified, causing death. This disease again appears to be a slow process like pyorrhea, for arterial sclerosis is a disease of old age. Although this theory is based on scientific evidence, it has not been proved.

By now I hope you are asking, "Where can I get vitamin C?"

The amount of vitamin C needed for health varies with each individual to a certain extent. At least one cup (8 oz.) or orange or grapefruit juice or two cups (16 oz.) of tomato juice should be taken daily by everyone, although twice those amounts is undoubtedly more ideal. The equivalent in the form of whole fruits can be taken instead if you desire. Let us look at a table of the richest sources of vitamin C, given in approximately equivalent amounts:

Raw foods:

orange juice	16 oz.	2 cups
lemon juice	16 "	2 "
grapefruit juice	16 "	2 "
green peppers	12 "	3 medium
tomato juice	32 "	4 cups
cabbage	11 "	4 "
strawberries	33 "	5 "
bananas	55 "	10 bananas
peaches	55 "	15 peaches
apples	222 "	37 apples

Home-cooked foods:

peas	55 "	11 cups
spinach	111 "	15 "
potatoes	78 "	13 "
corn	222 "	20 "
cabbage	222 "	75 "
peaches	222 "	30 "

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Commercially canned foods:

tomatoes (whole) -----	33 oz.	4	cups
peaches -----	55 "	7	"
pineapple -----	111 "	13	"
pears -----	222 "	47	"
apples -----	222 "	23	"
peas -----	33 "	3½	"
spinach -----	44 "	6	"
cabbage -----	44 "	16	"

Unfortunately, even the most ravenous person could hardly eat four cups of cabbage daily, although by weight it seems to be the richest source of this vitamin. Few people would care to eat three green peppers every day. Lemon juice is a bit too sour for quantity consumption, while all the other rich sources are very bulky. Therefore, if the vitamin-C needs are to be adequately supplied, orange, grapefruit, or tomato juice or the fresh fruit should be depended upon as the principal sources.

These juices should be supplemented as much as possible by salads of raw fruits and vegetables; by the use of raw and canned fruits for deserts instead of pastries; by using lemon juice in salad dressings instead of vinegar. But never should the juices be omitted.

Vitamin C is more easily killed by cooking, oxidation, and storage than any other vitamin. Canned foods, if cooked with the air excluded, have a somewhat higher vitamin-C content than home-cooked foods. Because this vitamin is soluble in water, it is not stored in the body.

For curative purposes, as in cases of either gingivitis or trench mouth, an entire quart of orange juice

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should be taken daily for two or three weeks. Likewise, in the treatment of ulcers, healing of wounds, before and after operations, knitting of broken bones, and in any case where new connective tissues must be formed, one quart of orange juice daily is to be recommended. Much better clinical results have been obtained from the use of orange than from tomato juice.

See that your daily vitamin-C intake is high, and the reward of greater health will be yours.

Summary of Vitamin C

Function in the body: protects the body against tooth decay, spongy gums, systemic pyorrhea, broken bones, internal hemorrhages; promotes normal bone and tooth formation; aids in healing of wounds; strengthens the connective tissues throughout the body.

Results of a deficiency: bruises; bleeding gums; small hemorrhages throughout the body; susceptibility to tooth decay; loosening of teeth; systemic pyorrhea; decalcification of the bones; easily broken bones; gum infections; lowered resistance to infections throughout the body.

Sources: orange, grapefruit, lemon, and tomato juice; green peppers, raw cabbage, fresh or canned tomatoes, raw spinach, lettuce, tangerines, watercress, strawberries, fresh peaches.

Solubility: in water; prevents storage in the body; necessitates daily supply for optimum health.

Stability: readily killed in cooking, storage or oxidation.

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Chapter 7

PREVENT TOOTH DECAY

Although every factor which is essential to normal nutrition is probably necessary to prevent tooth decay, it can safely be said that a deficiency of vitamin D is the greatest single cause.

Vitamin D is necessary for the body before it can properly use the two minerals, calcium and phosphorus. These minerals build and give rigidity to the teeth and bones.

A complete deficiency of vitamin D results in a disease known as rickets, which comes from the Old English word, "wrikken," meaning to bend or twist. As the name implies, this disease causes the bones and teeth to become crooked, twisted, and misshapen. A few years ago rickets was most prevalent, but since the use of fish-liver oil has been generally adopted in the feeding of babies, this disease in its worst form has almost completely disappeared.

Like the study of other vitamins, it is not the dire or complete deficiency of vitamin D which interests us so much now. Let us see what harm is done when this vitamin is not lacking altogether, but is supplied in amounts too small to promote optimum health.

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If vitamin D is amply furnished during all the years of growth, together with an otherwise adequate diet, the bones and teeth grow normally. The bones of the jaw are large and round, the arch of the mouth is broad, the teeth are evenly placed in relation to each other and in relation to the entire jaw. The teeth are white, hard, glistening, and regularly arranged. If one were to examine these teeth microscopically, he would find both the enamel and the dentine thick, smooth, and evenly and densely calcified. Because of the thickness and hardness of the enamel and dentine, the mineral salts will less rapidly be dissolved by the acids in the mouth. Such teeth are highly resistant to decay.

On the other hand, if vitamin D is insufficiently supplied in the diet during the growth period, a subtle or very mild type of rickets appears. The child with some vitamin D in his diet will perhaps not have bowed legs, knock-knees, or a pigeon chest, but nevertheless his bones will not be correctly formed. The jaw is likely to be small, the arch narrow, the teeth irregularly arranged, tilted with relation to the jaw, and crowded together. The biting edges of the upper and lower teeth may be so out of proportion that proper chewing is almost impossible. If other bones throughout the body were carefully examined, they too would show corresponding imperfections. These bones are less well calcified than normal bones. They are porous and contain relatively more soft connective tissue.

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The person with bones like this may go through much of life unaware of his condition, except that he may have an unattractive mouth. What is likely to happen when he reaches the pyorrhea-susceptible age? If he has had inadequate vitamin C, the connective tissues break down. This time, instead of normal bone, there is soft, porous, non-resistant bone being destroyed. How much more quickly the jaw bones can be absorbed! How much sooner he will lose his teeth from pyorrhea!

But inadequate vitamin D results not only in malformed jaw bones and crooked, unattractive teeth; the structure of the teeth themselves is very poor. If these teeth were cross-sectioned and examined under the microscope, one would find the enamel thin, perhaps pigmented, or even completely absent in some places. The dentine would also be thin, soft, and porous. In some places no minerals whatever are laid down, causing empty spaces or holes in the dentine. The pulp or nerve chamber takes up a large amount of the space which should have been filled in with thicker enamel and dentine. These teeth offer little resistance to decay compared to that of the hard, densely calcified, well-formed teeth. With the addition of ample vitamin D to the diet at the time the teeth were growing, such teeth could have been well formed.

Let us see what actually causes decay. Particles of food are likely to remain even in the cleanest mouth. Some of this food lodges on the surface of the teeth and is held there, forming what are called plaques.

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(There is evidence that large amounts of orange juice in the diet indirectly help to dissolve these plaques.¹) The bacteria of the mouth break down the starch and sugar in these food-plaques into lactic acid. The mineral matter of the tooth is dissolved in this acid, just as salt is dissolved in water. If enough acid is formed in any one place, as under the plaque, a hole is completely eaten through the enamel, on through the dentine, and if the tooth is not filled or the decay arrested, still farther to the pulp or nerve.

It seems logical that the thing to do in this case is to keep the teeth clean, so that food particles cannot remain in the mouth and acid cannot be formed. The statement that a clean tooth never decays may be absolutely true, but no one has been able to keep teeth sufficiently clean to prove it. Despite the fact that the brushing of teeth, the use of antiseptic mouth washes, and other similar measures have been greatly stressed during the last forty years, tooth decay has increased tremendously during that time. Moreover, the races of people who have had the best-formed teeth and the least decay have usually never heard of a tooth-brush.

A group of children who had active decay in their mouths and who frequently had new decay were given

1 Groves and Groves. Chemical study of human saliva indicating that ammonia is an immunizing factor in dental caries. J. Am. Dent. Assoc. 22, 247-52 (1935)

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adequate diets. During the four years while they were on these diets, no new decay appeared, and the old unfilled cavities became hard and brown, and did not increase in size. One of the investigators who observed these children reported that this improved condition could not possibly be due to good mouth hygiene for, as he says, "Their mouths were notably unclean."¹ Many such experiments have now been conducted on several thousand children and adults, always with the result that dental health is improved with adequate diets.

How does an adequate diet prevent tooth decay? What happens to the acid formed in the mouth?

An adequate diet must contain ample calcium and phosphorus, together with a generous supply of vitamin D. After the food is eaten and digested, these minerals pass into the blood and on into the saliva. It so happens that calcium and phosphorus can combine with hydrogen (the active principle of acid) and destroy the acid formed in the mouth. A harmless salt, something like table salt, is formed. This is swallowed with the saliva and is eventually excreted from the body.

Unfortunately, vitamin D is frequently lacking in the diet. The minerals, calcium and phosphorus, are often undersupplied. What happens now when acid is formed in the mouth? The acid is not destroyed as

¹ Boyd and Drain. Arrest of dental caries in childhood. J. Am. Med. Assoc. 90, 1867-69 (1928)

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it could have been had the diet been good. We know that acid combines with calcium and phosphorus, but there is little of these minerals in the saliva. However, there are calcium and phosphorus in both the enamel and dentine. The acid, therefore, must combine with the minerals in the tooth itself. If it is produced in sufficient quantities, as under a plaque, a cavity is formed. If it is produced throughout the mouth, and not neutralized, the teeth become soft and eroded.

It has been found that by adding vitamin D to an otherwise adequate diet, the amount of calcium and phosphorus in the saliva can be increased manifold.

During the growth period, the demand of the bones and teeth for calcium and phosphorus is so great that unless the diet is adequate, little of these minerals is left for the saliva. The saliva, therefore, is unable to protect the teeth from decay. This is of such frequent occurrence that tooth decay among growing children is almost universal.

As a person reaches adult life, his teeth decay less rapidly, for his need of vitamin D, calcium, and phosphorus is somewhat decreased. As people grow older, they may go for years without any new decay in their teeth. Still, they may not have improved their diets in any respect. How can this be? Let us see what is likely to be happening.

In the previous chapter we learned that a slight deficiency of vitamin C breaks down connective tissues in the teeth and bones, and frees calcium and phosphorus. This process is gradual and may go on for

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twenty to thirty years before enough bone is carried away and an infection in the gum tissue become sufficiently severe to be diagnosed as systemic pyorrhea. But during these twenty or thirty years minerals are escaping from the bones and dentine, and part of these minerals reach the saliva. These minerals neutralize the acids of the mouth and prevent decay. So it is that many patients whose teeth must be extracted because of systemic pyorrhea are remarkably free from decay. So it is, again, that many people have little decay after reaching adulthood. It may be that their diets have changed for the better. All too often it is only that pyorrhea is starting in their mouths.

Systemic pyorrhea actually offers remarkable proof that decay can be prevented. How much better it would be, however, if the calcium and phosphorus could have come, not from the bones and dentine, but from a diet rich in these minerals and in vitamin D. Would that the diet could be adequate in every respect, that it could contain ample vitamin C!

Vitamin D helps to prevent decay in still another manner. If an ample supply of vitamin D, calcium, and phosphorus is given in the diet, the teeth are strengthened by the laying down of what is known as secondary dentine, which merely means a second line of dentine formed after the teeth develop. This is laid down inside the original dentine. It is just as important to keep the dentine strong as it is to keep the enamel hard, for it can be an equal protection against decay. X-rays frequently show almost the entire

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pulp or nerve chamber filled with this second formation of dentine. When a second thick well-calcified fortification of dentine is laid down in this manner, the nerve of the tooth is carefully protected and the life of the tooth is made longer.

If one can judge from experimental work done on the teeth of dogs, no secondary dentine whatsoever is laid down if the diet is inadequate in vitamin D. If the diet contains a small amount of vitamin D, a thin layer of poorly calcified porous secondary dentine, which is not resistant to decay, is laid down. If, however, the diet is rich in vitamin D, there is a thick extremely hard protection of this dentine standing guard over the life of the tooth. Therefore, by eating a diet high in vitamin D and minerals, poor teeth can be made to outlast many of those which are better formed.

In order to prevent tooth decay, three major approaches must be considered: first, the diet given during the development of the teeth must be adequate in every respect in order that the teeth may be well formed, straight, and strong; second, throughout life the teeth must be protected from without by an adequate diet which furnishes ample vitamin D, calcium, and phosphorus in order that these minerals may reach the saliva to absorb the acids of food fermentation; third, throughout life the inside of the teeth or dentine must be protected by an adequate diet high in vitamins D and C, calcium, and phosphorus in order that the teeth may not be left merely shells of enamel, covering soft non-resistant dentine, offering slight protection to the

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nerves against the invading onslaught of bacteria. If any of these approaches are overlooked, the teeth can easily be destroyed.

This simple explanation of the phenomenon of tooth decay is, of course, only a part of the entire picture. However, it is a very important part.

It seems that nature must have intended us to obtain our vitamin D from the sunshine, because she has put it into so few foods. Before we advanced to the stage of civilization we now enjoy, people wore less clothing and lived out-of-doors more than we do today. Their vitamin-D needs were possibly adequate; today ours are pitifully inadequate.

A very small amount of vitamin D is found in liver, cream, butter, cheese, and eggs, providing the living animal from which these foods came was exposed to the sunlight. These foods are not dependable sources of this vitamin.

In the skin of men and animals there is a waxlike substance called ergosterol which changes into vitamin D when exposed to the shortest rays of the sun. Often when you think you are getting the full value of the sunlight, these rays do not even reach the earth. Early in the morning, late in the evening, and during the winter the sunlight has little therapeutic value. Even at noon the ultra-violet rays may be cut off by dust, fog, or smoke in the atmosphere. Often persons are unable to take daily sunbaths even in the summer. One has only to follow a busy housewife through the course

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of one day to realize why she does not have a tan by September.

The same substance which is in the skin, ergosterol, is also in many foods. When these foods are exposed to ultra-violet light or are irradiated, vitamin D is formed. Many such irradiated foods have appeared on the market: yeast, oatmeal, bread, milk and others. The amount of vitamin D in these foods is possibly enough to aid utilization of the calcium and phosphorus they contain, but not enough to be relied upon as an adequate daily source. Vitamin-D milk is far superior to other foods containing vitamin D which have appeared thus far on the market. This should be used by everyone who drinks whole milk (vitamin D is soluble in fat), not as a substitute for fish-liver oil, but in addition to it.

Fish-liver oils are by far the best sources of vitamin D. These should best be used daily throughout the year, but most particularly in winter when you get no sunshine. However, there is no vitamin A in sunlight at any time of year.

There is on the market a product known as Viosterol which is an extremely potent source of vitamin D. However, like sunshine, it contains no vitamin A. While it is a valuable product, it should be used by adults only on the advice of a physician or a dentist.

As in the case of other vitamins, the exact amount of vitamin D needed by each person varies with each individual. During the entire growth period (which means up to twenty-one years) at least one table-

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spoonful of cod-liver oil or its equivalent in other oils should be given daily. This oil should be either rich in natural vitamin D or reinforced by the addition of Viosterol, for the requirements are high during these years. A plain fish-liver oil, without the addition of Viosterol, is thought to be adequate for normal adults. Larger amounts of vitamin D are needed during pregnancy, for the healing of broken bones, or for the arresting of decay. Throughout life, this vitamin should be included in the daily diet as a preventive measure.

The popularity of sunbaths during the summer is doing much toward supplying our vitamin-D needs. Ideally every person's body should be exposed to the sun for perhaps one-half hour daily between 10 a.m. and 2 p.m., when the sun's rays are most directly overhead. Even a new-born baby should be put into the sun daily, starting with 2 or 3 minutes on either side and gradually increasing to perhaps 15 minutes or longer. Sunburn, of course, should always be avoided. Small children should be allowed to wear sunsuits as much as the weather permits. Adolescent boys should be encouraged to play without shirts, while short hose and backless dresses often worn by young girls is certainly desirable.

However, it is the adults who most often fail to get sufficient sunshine during the summer. Hats should be worn as little as possible. If one side of the street is shaded and the other side sunny, the person who gets little sun should cross the street if necessary to

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walk in the sunshine. Any business man or woman should try to get into the open at least one day a week by planning picnics in the woods, trips to the beach, or perhaps play golf or tennis in shorts. A busy house-wife can often prepare vegetables sitting in the sun, wearing a short-sleeved dress, her hose rolled to her ankles, and without a hat. Gardening should be done with as much of the surface of the skin exposed to the sun as possible. Elderly people, particularly, should be encouraged to get into the sunshine whenever possible, for their bones are often brittle and their calcium intake inadequate.

One has only to look over the few available sources of vitamin D to realize how many people, children whose teeth and bones are being formed and poorly formed, as well as adults, pass the entire winter without any of this vitamin whatever. Thousands of others get only the most minute amounts of vitamin D, amounts too small to keep their teeth free from decay. Would that only a small part of the money spent annually on dental repairs could be spent in fish-liver oil!

Ask any dog lover if he feeds his dog fish-liver oil, and his answer will probably be yes. Ask him if he takes it himself, and the chances are that his answer will be no. If you dare, ask him, "Which stays healthier, you or your dog?" If he answers honestly, he will probably say, "My dog."

Some of you are saying, "I cannot afford to buy fish-liver oil."

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You cannot afford not to buy it, and for every member of your family!

Summary of Vitamin D

Functions in the body: increases absorption of calcium and phosphorus; stimulates mineral metabolism in the teeth and bones; prevents rickets; prevents tooth decay; prevents nervousness by aiding calcium absorption.

Results of a deficiency: poorly formed teeth; crooked teeth; small, crowded jaws; decayed teeth; lower content of calcium and phosphorus in bones; fragile bones which break easily.

Sources: halibut-liver oil, cod-liver oil, shark-liver oil, sardine-liver oil, tuna-liver oil; Viosterol; vitamin-D milk.

Solubility: in fat; permits storage in the body, but to less extent than vitamin A.

Stability: unhurt by cooking or oxidation.

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Chapter 8

CALCIUM AND PHOSPHORUS NEEDS

Let us suppose we plan to put up a brick building. We are well supplied with cement to hold the bricks together. We have engaged laborers who are necessary if our bricks are to be utilized. But we are short of bricks. Our building cannot be so high as we would like it to be, nor can it be so enduring.

Thus it is with our bodies. If calcium and phosphorus (bricks) are inadequately supplied, our building, or skeleton, cannot be strong. The addition of more vitamin C (cement) or D (laborers) is not going to solve our problem.

Naturally, the more bricks we have, the taller the building we can put up. Similarly, studies have shown that considering the people of nations as a whole, those who eat these minerals, calcium and phosphorus, in generous amounts are the tallest. Examples of these are the Finns, Bulgarians, Arabs, and Dutch whose diets are largely made up of foods rich in calcium and phosphorus, such as milk and cheese. Conversely, those people who eat the least amount of these minerals are the shortest, as, for example, the Oriental races, who rarely use milk products in any form. It has been

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found that children of Chinese and Japanese parents who have grown up in this country are several inches taller than their parents.

Americans, who as a race are of medium height, strike a balance between these two groups of peoples, but unfortunately this is not a happy medium. Both of these minerals should be more generously supplied in our diet than they are today. In fact, the lack of calcium has been considered one of the most outstanding deficiencies in the American diet.

If an insufficient amount of calcium and phosphorus is given during the period of growth, the bones and teeth are poorly formed. They are not well calcified and are often soft, porous, and easily broken. Inadequate amounts of these minerals cause children's growth to become stunted. Often the parents of such children have had inadequate diets during their own growth period, and thus they themselves are not properly developed. In this case the lack of development on the part of the children is said to be hereditary, and the inadequate diet is thus lightly excused.

Between the years from twelve to sixteen comes a period of rapid development. Especially the bones are growing rapidly and need large amounts of calcium and phosphorus. The teeth, though still laying down minerals, need them to a lesser extent than do the bones. In case the diet at this time is not adequate, the bones "steal" the minerals from the teeth. The inside of the teeth is thus weakened. With such a crying need for these minerals, only insignificant amounts

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are left for the saliva. As you would naturally expect, a period of rampant tooth decay follows.

A similar condition exists during pregnancy. Here the baby is developing and needs calcium and phosphorus for its tiny bones. All too often the expectant mother discontinues the use of milk because she believes it is fattening. Though both mother and child have great need of these minerals, the child's need is now the more urgent. These minerals are therefore "stolen" from the mother's teeth and bones. Thus it is that mothers lose not merely the proverbial one, but an average of two teeth for every pregnancy. These teeth could easily be saved.

Thus far we have considered conditions which exist when the diet is adequate in all other respects except in calcium and phosphorus. Such conditions are unlikely. Often the growing child and the pregnant mother do not drink sufficient orange juice or take fish-liver oil, or adequate substitutes for either. Without adequate vitamin C the connective tissues break down, and calcium and phosphorus are freed, even though very little of them is laid down. Without vitamin D what small amounts of calcium and phosphorus are in the diet cannot be utilized. How much easier it will be for pyorrhea and other abnormalities to develop!

Although 99 percent of the calcium in the body is found in the bones and teeth, the remaining 1 percent plays a tremendously important part in regulating certain of the physiological functions.

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Calcium is necessary for the coagulating or clotting of blood. Lack of calcium leads to hemorrhages which follow the extraction of teeth, an operation, or a nose bleed, in which the blood does not clot readily. Prior to extractions or operations of any kind, for treatment of excessive menstrual flow, and during hemorrhaging of any type, calcium and vitamin D should be liberally taken.

Calcium is essential to the normal action of the heart. There is some evidence that certain types of heart disease are due to partial calcium starvation, particularly the very fast so-called "nervous" heart.

Calcium is necessary to the contraction of muscles and aids in building strong muscle tone. In rickets, the disease in which lack of vitamin D makes it impossible for the calcium to be utilized, the muscles become soft, stringy, and elongated. This factor is important in the correction of poor posture.

Calcium is particularly important for the health of the nerves, and its lack leads to a tenseness and irritability of the nerves. The child who is growing rapidly and whose bones claim a monopoly on the body's calcium supply is frequently nervous and irritable. Rarely does the mother connect this "bad disposition" with her failure to see that the child's calcium intake is high.

I recall a child who was once brought to my office for diet supervision. This child had never drunk milk for she was susceptible to milk poisoning. The mother told me that the girl was extremely high strung, was

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most irritable, cried easily, had temper tantrums, and was, in short, what is known as a "problem child." I recommended only one change in her diet which was otherwise excellent: that a salt, dicalcium phosphate, be given her daily. In less than a week's time, the mother reported that she had so completely changed that one would not recognize her as the same child. Her starved nerves had been given calcium.

The lack of calcium is actually more of a problem with adults than it is with children. The high-strung, nervous, often irritable man or woman sees no connection between his condition and his refusal to drink milk. The influence of calcium upon the nerves is so great that one is tempted to say that an increased calcium intake might easily decrease the number of divorces in this country. If the influence of calcium in this respect was appreciated, many housewives would serve more calcium-bearing foods as a means of keeping peace in the family.

The supply of calcium in the blood is decreased prior to and during the menstrual periods of women. This period is frequently accompanied with extreme nervousness, depression, headaches, and abdominal cramps. A generous supply of calcium and vitamin D added to the diet at this time will often cause these symptoms to disappear.

During pregnancy an inadequate calcium supply leads to extreme nervousness and muscular cramps. Nausea is often produced by muscular irritability in the stomach and abdomen. During the last months, when

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the baby is storing calcium, this need may become serious. Nervous tension in the walls of the blood vessels often cause them to tighten. The blood must exert greater pressure to pass through; thus the blood pressure becomes abnormally high. Occasionally a condition known as eclampsia results, accompanied by high blood pressure, and frequently causes premature birth and often loss of the baby's life. Eclampsia is treated with injections of calcium in the blood. How much superior is the eating of the adequate diet throughout pregnancy!

It has long been known that warm milk taken before retiring induces sleep. Milk offers calcium in an easily digestible form, while heat quickens digestion. The increased calcium intake soothes the nerves, and sleep follows.

About 70 percent of the phosphorus in the body is in the teeth and the bones, and 30 percent in the body tissues. Phosphorus is a part of each of the billions of cells in the body. It is a constituent of the blood, of all glandular secretions, and of all body fluids. Fortunately, it is much less likely to be deficient in the ordinary diet than is calcium.

Every day, regardless of the amount of calcium and phosphorus eaten—and you may eat very little or none—what we might call “worn-out” calcium and phosphorus are excreted in the urine and feces. Year in and year out, this “waste” goes on. If you are not eating enough of these minerals to supply the

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nerves, muscles, and body fluids, once again they must be "stolen" from the bones and teeth.

Neither calcium nor phosphorus can do its work alone. Vitamin D must be supplied before they can be utilized. If large amounts of calcium and phosphorus are eaten and vitamin D is lacking, still greater amounts will be excreted. The amounts excreted consist of the minerals in the diet, which cannot be used, and the "worn-out" calcium and phosphorus which have been "stolen" from the bones and teeth. Unless the three of these substances, calcium, phosphorus and vitamin D, are furnished, none of the three can do its work efficiently. It can now be seen that the influence of vitamin D on health is much more far reaching than merely the part it plays in the prevention of tooth decay.

If calcium and phosphorus are eaten generously, so generously that the body does not need all that is eaten, they are stored in the ends of the long bones. These surplus minerals are formed into delicate, lace-like structures called trabeculae. Here they are easily accessible to the blood stream. Whenever there is a shortage of these minerals, the stored calcium and phosphorus are called on and carried by the blood to the parts of the body which need them. Obviously, if no surplus of these minerals is taken in the diet, then no trabeculae are formed. The wise person sees to it that he always has this extra supply of calcium and phosphorus for the body to call upon in case of emergency.

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One gram of calcium daily and slightly more than one gram of phosphorus are considered the standard in the feeding of growing children. This amount of calcium is furnished by one quart of milk, while the milk, one egg, some bread, and cereal will supply the needed amount of phosphorus. Since we know that an excess can be stored and since we are striving for optimum health, that amount might well be recommended to adults and a more generous amount given to children.

Milk, buttermilk, and cheese are the only sources of calcium which can possibly furnish a daily adequate supply. Such foods as egg yolk, almonds, walnuts, oatmeal, oranges, and cabbage do contain calcium, but when amounts which would furnish an adequate daily requirement are considered, one finds it would be impossible to eat enough of them. Many vegetables, such as spinach and carrots, contain appreciable amounts of calcium, but it has been shown by careful studies that the calcium is not easily absorbed by the body because it is held between the vegetable fibers. Vegetables, of course, should be generously eaten, but they should not be relied upon as a source of calcium.

The sources of phosphorus are cheese, egg yolk, milk, whole-grain breads and cereals, meats, nuts, fish, and dried beans. The person who drinks a quart of milk daily and eats cheese, meats, eggs, and a reasonable amount of bread is undoubtedly adequately supplied with this mineral.

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Each day of life, every man, woman and child should have a quart of milk to furnish the calcium needs of his body. Cheese in some form should be served daily in every household. In addition, it is often wise, as during the last months of pregnancy, during the period of rapid growth, during menstrual periods, as a correction for nervousness, and before operations of any kind, to take a simple salt such as the readily soluble dicalcium phosphate. This salt is sold in both tablet and powder form at drugstores, but if taken, should be in addition to milk and cheese, and not a substitute for them.

Drink a quart of milk daily from the cradle to the grave, and a higher degree of health will be yours.

Summary of Calcium

Functions in the body: gives rigidity to the bones and teeth; helps prevent tooth decay; aids normal nerve action; is essential to healthy muscular contraction and strong muscle tone; is necessary for normal heart action; promotes normal growth.

Results of a deficiency: susceptibility to tooth decay; susceptibility to erosion of teeth; short stature; bones which break easily; nervousness; muscular cramps or pain; types of high blood pressure; "nervous heart"; nervous headaches.

Sources: whole milk, skim milk, buttermilk, cheese of all kinds.

Particular need: can be utilized in the body only when vitamin D is present.

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Summary of Phosphorus

Functions in the body: gives rigidity to bones and teeth; helps to prevent decay; is essential to life of every body cell; is a necessary part of all glandular secretions and body fluids; promotes normal growth.

Results of a deficiency: susceptibility to decay and erosion of teeth; susceptibility to pyorrhea; short stature; bones which break easily.

Sources: milk, cheese, egg yolk, meats, fish, whole-grain breads and cereals, dried peas and beans.

Particular need: can be utilized in the body only when vitamin D is present.

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Chapter 9

STERILITY, PREGNANCY, AND LACTATION

There is a vitamin, called vitamin E, which is essential to normal reproduction. When this vitamin is absent from the diets of experimental animals, the males become sterile, and the females consistently lose their young before they have developed. Also vitamin E seems to be essential to normal growth and the proper functioning of the pituitary gland. When absent from the diets of young animals, it leads to paralysis.

Whether or not this is a factor in the similar problems of human nutrition, science has yet to tell us. However, vitamin E is so widely spread in our foods that probably few people are inadequately supplied with it.

It is known that eggs laid by hens lacking vitamin E fail to hatch; conversely, that sterile cows, given large amounts of vitamin E, have again had calves. A report was made of two women who had a history of four and five previous miscarriages respectively, but who carried through successful pregnancies when given large amounts of wheat germ, which is the richest source of vitamin E.

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A prominent obstetrician recently told me that he had decreased the number of miscarriages in his practice to a very small percent of what they had formerly been by having all of his patients use wheat germ daily after their first visit to him. Since wheat germ is the richest source of both vitamins B and E, it is impossible to tell which was the determining factor, but undoubtedly the increased intake of vitamin E exerted a favorable influence.

The richest sources of vitamin E are the embryo of grains, seeds, green leaves such as lettuce and alfalfa, muscle meats, liver, and egg yolk. Of these, wheat germ is by far the richest source. While it is particularly important for people who want children, and for pregnant women to use wheat germ liberally, those who wish to attain perfect health are wise to have an ample supply of vitamin E in their diets as a protective measure until the time science shows in greater detail its influence on human nutrition.

The inadequate supply of vitamin E is by no means the only factor which leads to sterility. Insufficient amounts of other vitamins, minerals, and protein can also lead to sterility and decreased sex interest. Obesity also lowers fertility. Sterile women who are obese are more likely to become pregnant when their weight is reduced.

A study made of the food habits of 206 sterile women revealed that their diets were below the accepted standard in vitamin, minerals, protein, and calories. Their dietaries were corrected, and during the two

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years of this study 40 percent of the women became pregnant.

A dietary sufficiently adequate to promote optimum health influences and increases fertility. One writer states, "When advice is asked concerning the avoidance of sterility it is not out of place for the physician to inquire minutely into the diet of both husband and wife; when dietary faults can be detected, their correction will enhance the likelihood of progeny."¹

Even though the diet may be sufficiently adequate to allow conception to occur, it may not be adequate enough to promote a successful pregnancy. Lack of vitamins A and B, as well as vitamin E, leads to early miscarriage of the fetus. It is greatly to her own advantage for any woman who plans to undertake a pregnancy to live on an adequate diet for many months prior to the time of conception.

At no time during the life span of a woman should her diet be watched more carefully than during the months before the birth of her child. We have all heard much about the harm done by inadequate reducing diets; that harm is small indeed compared to the tremendous harm done by inadequate prenatal diets.

Pregnancy is a time of joy and happiness for the woman in optimum health. Illness on the part of the expectant mother can easily be avoided, but unfortu-

1 McLester. Nutrition and diet in health and disease, p. 297. 1931. (W. B. Saunders Company)

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nately it is so common that it is accepted as a normal condition instead of the abnormal condition which it is. During the early months of pregnancy sugar is used rapidly by the body; the blood sugar may become abnormally low. The body cannot function normally without sugar (see acetone acidosis, page 179); nausea and vomiting often result. The amount of calcium in the diet is also likely to be undersupplied. We have learned how insufficient calcium causes muscular cramps; these cramps, if in the abdomen and stomach, can easily lead to nausea and vomiting. By the time one or two meals are lost because of cramps, the body's supply of sugar has been exhausted. Acetone acidosis, which causes nausea and vomiting, is the result. Then the condition develops into a vicious circle. The more meals which are lost, the more severe becomes the acidosis; the more severe the acidosis, the worse becomes the vomiting. This sometimes leads to pernicious vomiting, which can become so severe that a surgical abortion must be performed in order to save the mother's life.

Although the diet before the beginning of pregnancy and during the first weeks of pregnancy should be adequate in every respect, three dietary factors should be particularly emphasized at this time: calcium, vitamin D, and small frequent meals which will enable the blood sugar to remain at a normal level. The calcium can be amply furnished by a quart of milk and one or two servings of cheese daily. As an additional precaution, the taking of a calcium salt such as dicalcium

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phosphate may not be out of place at this time. Two or three capsules of halibut-liver oil or cod-liver-oil concentrate daily will furnish ample vitamin D.

If something is eaten every hour, highly refined starches and sweets need not be taken. Foods high in fats should be avoided, for they enhance the danger of acidosis. Large meals, which are likely to upset the stomach, should also be avoided. Since it is impossible to eat hourly during the night, foods rich in sugar, such as a large glass of orange juice with graham crackers, should be taken immediately before retiring. The blood sugar most often drops during the night, causing nausea and vomiting early in the morning. Therefore it is well to have food beside the bed to be eaten during the night in case one awakes. Fruit, cereal with milk, and toast should be taken again immediately on waking. If the expectant mother cannot obtain food for a few hours, she should eat hard candy always carried for this purpose. These small meals need be neither large nor of fattening foods; hence an undesired gain in weight is unnecessary.

From the fourth month to the end of pregnancy the expectant mother can eat three meals daily, supplemented by three small regular midmeals.

The old belief that a pregnant woman should eat for two is not true with respect to the quantity of food she must eat, for she need not increase the amount of food except during the last two months, and then only slightly. However, she must eat for two with respect

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to minerals and vitamins. Her daily diet during this time should include:

- 1 quart of skim milk
- 16 oz. of orange, grapefruit, or tomato juice
- 1 egg
- 1/2 cup of wheat germ
- 1 but preferably 2 fish-liver-oil capsules
- 1 serving of cottage cheese
- 3 or more servings of colored vegetables
- 2 or 3 servings of fresh fruit, emphasizing citrus fruit
- 1 serving of meat or fish with liver once weekly.

Many patients gain rapidly during pregnancy. This is often caused by their failure to eat frequently, for they overlook the importance of destroying their appetite as a means of maintaining their normal weight. If the patient must reduce during pregnancy, tomato juice may be used entirely in the place of orange or grapefruit juice; yeast tablets can be substituted for the wheat germ. Aside from these, the diet outlined here is entirely a reducing diet.

On the other hand, if the patient needs to gain, she may have whole milk instead of skim milk, and she can add any amount she desires of other cheeses, cream, and butter. Foods which are rich in sugar and starch should be avoided throughout pregnancy by the overweight and underweight patients alike, for they are so filling that they invariably replace fruits and vegetables much higher in minerals and vitamins.

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The diet during pregnancy determines whether or not the mother will be able to nurse her baby. Even in this day of better feeding of babies, the mortality rate in the entire country is many times greater for bottle-fed than for breast-fed infants. Comparative studies of the two likewise show that the bottle-fed babies have many times more infections and diseases than the breast-fed. The breast-fed baby has a far better chance of reaching optimum health. Although many misinformed people see fit to argue the value of this point, everyone agrees that the mother who nurses her own baby derives much greater happiness from her motherhood than the one who gives her baby a bottle.

Protein foods are often denied the mother during the last months of pregnancy, although there is little scientific support for such a practice. Large amounts of proteins are needed to stimulate milk flow. The only good sources of vitamins B and G are often omitted from the diet because whole-grain breads and cereals and whole milk cause unwanted gains in weight. Usually no substitutes are given in their stead, despite the fact that it has long been known that a mother needs more of both vitamins B and G during her nursing period than at any other time in her life. It is, therefore, easy to understand why the average mother of today cannot nurse her baby.

The mother who has had an adequate diet during pregnancy need change it little in order to secrete sufficient milk. The amounts of wheat germ or yeast or of both should be increased to furnish additional vitamins

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B and G. She may have meat twice daily instead of once, or two eggs in the place of one. Her liquids should be increased to about three quarts daily. This can be additional skim milk, fruit juices, tea, coffee, soups, or home-brewed beer, which contains yeast rich in vitamins B and G. Large amounts of fat, which inhibit the flow of milk, should be avoided. Starches and sweets should also be kept low in her diet. Fish-liver oil should be continued. A milk-stimulating diet is not a gaining diet. The mother who lets herself gain during this time does so unnecessarily.

Even though the mother is on an ideal diet and has sufficient milk for her baby, certain supplements should be given the child. Two to five drops of cod-liver-oil concentrate or one-half teaspoonful of the plain cod-liver oil should be started as early as the second week of life, preferably put directly into the baby's mouth. A few drops of a good vitamin-B concentrate and strained orange juice should be added each day to the drinking water, again beginning when the baby is only two weeks old. One teaspoonful of orange juice can be given at first, and that increased by one-half teaspoonful daily to three or four ounces. The drinking water itself should be water which has been used in cooking vegetables and which contains valuable vitamins and minerals. The water should not be diluted, and since it has already been boiled, it need only be heated to luke warm.

The cost of an adequate diet during pregnancy and lactation may seem large at first; however, it is small

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compared to the average dentist bill which follows the usual pregnancy.

One can only be amazed at the number of mothers who exhibit well-fed beautiful babies, but whose own bodies are woefully malnourished. This period need not be a time of stress. Eat an adequate diet before, during, and following pregnancy, and optimum health can be yours to help make this one of the happiest periods of your life.

Summary of Vitamin E

Function in the body: necessary for normal reproduction.

Results of a deficiency: sterility in males; miscarriage in females; probably necessary for secretion of human milk.

Sources: wheat germ, liver, egg yolk, lettuce, green leaves.

Solubility: in fat; permits storage in the body.

Stability: unharmed by cooking; destroyed by rancidity.

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Chapter 10

LONGEVITY

Vitamin G is unique in that it is the only one of all the vitamins in which a deficiency has been sufficiently severe to cause the death of thousands of people annually in the United States. This is rather a startling fact to be faced by a nation proud of the health of its people. The highest death rate from pellagra has been among the poor people of the southern states, whose diet largely consists of corn products, sweet potatoes, salt pork, and molasses. Chronic alcoholics (who certainly do not drink milk) often have pellagra. During the depression it has also appeared among men who tell of months without work and of food obtained from breadlines.

A wealthy woman once called me for advice concerning her diet. She had collected from faddists much misinformation about foods which were "harmful." Moreover, she was convinced that many good foods did not agree with her. For years she had kept herself on a most restricted diet, from which she had eliminated all the vitamin-G bearing foods. At the time I saw her, she was emaciated and extremely nervous. Her tongue, mouth, and stomach were so sore that she had great difficulty in eating anything. She ran a six

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stool diarrhea daily. Her skin was blotched with dark spots resembling sunburn, and her forearms and other parts of her body were broken out with a severe rash or dermatitis. A physician who was called made the diagnosis of pellagra. An adequate diet rich in vitamin G was given her, and her condition cleared up.

Like other vitamins, however, only small amounts of vitamin G are needed to prevent pellagra. The amount of vitamin G necessary to promote optimum health, however, must be far more liberal than that necessary to prevent pellagra.

Let us look at experimental animals (white rats) whose diets are adequate in all other respects except for vitamin G. These animals take on all the characteristics of senility at a very early age. They lose their fur, in many cases the entire head, neck, and trunk becoming completely denuded. Their skin becomes wrinkled, blotched, rough, and sore. The muscle tone is lax, and the muscles under the skin saggy. These lethargic animals sit hunched in their cages, old before their time, miserable-looking figures, reminding one of an old man or woman at the age of ninety.

Their brothers, whose diets are identical except for ample vitamin G, have thick, glossy hair, bright eyes, and healthy skin. These more fortunate animals have skin free from wrinkles, firm muscle tone and excellent "posture." Perhaps the greatest difference between these two groups of animals is in regard to vigor. The vitamin-G-fed animals are alert, "peppy," full of life, and extremely vigorous. The animals lacking vitamin

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G die at an early age; those which have vitamin G live much longer; and those in whose diets vitamin G is most abundantly supplied live much longer still.

So it is that vitamin G preserves the characteristics of youth to a very late age. Ample vitamin G increases vigor and prolongs that vigor to a late age. Generous amounts of vitamin G added to the diet increase the level of positive health to such an extent that the life expectancy of the individual is lengthened.

Excellent examples of this longevity are to be found among the Bulgarians, who live so largely on milk and cheese that their diets are extremely rich in this vitamin. These people are noted for living longer than any other people, and although their population is small, they have more centenarians than any other people. Not only this, but they retain their vigor and their characteristics of youth to a very late age.

The richest sources of vitamin G are standardized brewers' yeast, milk, cheese, liver, kidney, muscle meats, and eggs. Smaller amounts of vitamin G are found in such vegetables as carrots, spinach, watercress, lettuce, and cabbage, but these foods are too bulky to be eaten in quantities large enough to furnish an adequate daily supply. People rarely care to eat more than four to six ounces of meat, eggs, or cheese daily, while thirty-two ounces of milk (1 qt.) can easily be taken; therefore, milk actually becomes the richest practical source of this vitamin. Non-fattening skim milk, which contains the vitamin G, should be taken daily by those who wish to maintain their weight or to reduce.

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Powdered milk, which retains its vitamin-G as well as its calcium, phosphorus, and protein content, can be advantageously used in increasing the family's vitamin-G intake. This milk, which has long been used in hot-cake and biscuit flours and similar preparations on the market, for camping trips, and on shipboard, has not been adopted for general use in the household as much as its health-giving qualities demand that it should. One pound of powdered milk gives you the same food value as six quarts of fresh milk. In any baking, powdered milk can be sifted with the flour, and either water or fresh milk used as moisture. In this way five or six times more milk can be incorporated in the product than the recipe calls for. In like manner, one cup of powdered milk, equaling three quarts of fresh milk, may be shaken with one quart of water, thus giving the value of three quarts of milk in the volume of one. This milk can be used in cream soups, cocoa, puddings, and the like. The advantage of this milk is that it is more concentrated, and the amount equivalent to a quart of fresh milk can be bought, in bulk, for a cent or two. It should be used in addition to whole fresh milk unless economic circumstances make it necessary to use powdered milk entirely.

Since vitamin G is soluble in water, it is not stored in the body for any length of time. If you are to reach and retain a high level of positive health, then vitamin G must be included amply in your daily diet.

Any person who wishes to retain the characteristics of youth to a late age, who wishes to have skin free

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from wrinkles, blotches, and irritations, who desires firm muscle tone under the skin, who wishes to be more vigorous and to retain that vigor until late in life, and who wants to live long, should drink a quart of milk daily for its vitamin-G content alone. One quart of milk daily has long been recommended to children, chiefly for its calcium content. Since adults need less calcium than children, only one pint of milk daily has been recommended to them. The tremendous influence of vitamin G on longevity has been realized only during the last few years. For this reason one quart of milk daily is now to be heartily recommended to adults, not so much for its calcium content, although the additional calcium is undeniably of value, but because of its richness in the vigor-giving vitamin G.

Summary of Vitamin G

Functions in the body: is necessary for growth; promotes physical well-being; increases firmness of muscle tone; makes for smooth healthy skin; increases and retains vigor; preserves the characteristics of youth to a late age; increases longevity.

Results of a deficiency: wrinkles; poor muscle tone; irritations of the skin; blotching or pigmentations of the skin; shortened life span; early loss of the characteristics of youth; early loss of vigor; a dire deficiency causes pellagra.

Sources: whole milk; skim milk; powdered milk; cheese; brewers' yeast; liver; kidneys; egg; lean meats; small amounts in some vegetables.

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Solubility: in water; does not permit storage in the body.

Stability: not hurt by cooking.

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Chapter 11

MINERAL NEEDS

There are many minerals needed by the human body in order to promote health and well-being in adults and in children. Of these, magnesium, potassium, sodium, chlorine, sulfur, and manganese are so widely and abundantly distributed in foods that they are rarely deficient in the diet. As far as is known, a slight deficiency of any of these substances does not lead to any widely spread abnormality.

Besides the amounts of these minerals in foods, sodium and chlorine are amply furnished in the form of common table salt. Though excessive amounts of salt need not be eaten, both minerals are needed in the body. Chlorine is used in forming the hydrochloric acid needed by the stomach, while sodium is important in helping maintain the body's acid-base balance. Salt should, therefore, not be omitted from the diet unless on the recommendation of a physician.

The people who have written most voluminously about the "deficiencies" of these minerals are the fadists, who realize that most people know little of the mineral supply in foods. They are merely playing upon one's ignorance. They tell you that a lack of magnesium, for example, causes anything from cancer

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to ingrown toenails, and that an abundance of potassium develops personality. At that point they try to sell you a bottle of liquid or tablets which supposedly conceals copious amounts of either magnesium or potassium.

Even if you had such a deficiency, it would be much easier and cheaper to supply these minerals by eating more potatoes and leafy vegetables than to buy such a concoction. The sooner people learn to ignore such money-making schemes, the better off they will be.

Iodine is needed in minute amounts by the body in order that the thyroid gland can function normally. Too small amounts of iodine lead to a disease known as goiter, which is prevalent around the Great Lakes and in other sections of the country where the water and soil lack this substance. Since the ocean is the principal source of iodine, seafoods become our richest food source, and for this reason, should be eaten frequently. Iodized salt is widely sold on the market and is considered valuable except in certain types of goiter. Such cases, of course, should be under the care of physicians.

Iron and copper are two other minerals which are essential to life. Iron is necessary to enable the blood to carry oxygen throughout the body; it builds blood more efficiently when a trace of copper is present.

The life of a red corpuscle is approximately six weeks; then it is broken up, and iron and copper are

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thrown off in the body excretions. Every day these minerals are excreted. If a new supply is not furnished, the body becomes mineral poor. For this reason a constant supply of iron and copper must be furnished if positive health is to be obtained.

Before a baby is born, enough iron is stored in its body to last through the first few months of its life, provided the mother's diet furnishes ample iron to be stored. If her diet is inadequate in this respect, the supply of minerals in her body is sacrificed. Therefore, the mother frequently becomes anemic. In case of twins not only the mother but also the babies are often anemic, since such large amounts of these minerals are needed. Also, a baby born prematurely is likely to be anemic, for the time of iron storage is shortened in this case. Obviously, the diet of the expectant mother should be rich in foods containing iron and copper.

During the early part of a baby's life, its principal food is milk. Milk is notably poor in iron. When a research worker wishes to produce experimental anemia in an animal, he does so by feeding a diet of milk alone. Unfortunately, such "experimental anemia" has been produced unintentionally in so many thousands of babies that a lowered hemoglobin during the fifth, sixth, and seventh months of life is considered normal. For this reason, a good source of iron and copper, such as powdered spinach or powdered liver, both of which are sold at drugstores, should be given along

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with fish-liver oil and orange juice as a preventive measure during the early months of the baby's life.

Because of the menstrual cycle, women have a proportionately higher iron requirement than men. As a general rule, women eat smaller amounts of foods rich in iron, such as eggs, meat, and whole-grain breads and cereals, than men do. As a result, women develop secondary anemia in deplorable numbers.

It must be remembered that deficiencies of both vitamin A and B lead to anemia.

The richest sources of iron are liver, red meats, egg yolk, green vegetables, and whole-grain breads and cereals; the sources of copper are oysters, liver, sea-foods, egg yolk, and apricots. Such foods as these should be eaten frequently.

Minerals in fruits and vegetables are held inside of cells. The walls of these cells are called cellulose or roughage, and are often tough and hard. Unless these walls are softened by cooking, the minerals are not freed. The human body does not break down, or digest, these cell walls, except as they are destroyed by bacterial action in lower bowel, where little absorption can take place. For this reason, foods should be cooked until they are quite soft. On the other hand, the preservation of vitamin C, which is readily destroyed by cooking, and of vitamins A and B, which are killed by long cooking, makes it necessary to cook foods only until the cell walls are soft. Because boiling water contains less oxygen which harms the vitamins, water

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should be boiling before the food which is to be cooked is put into it.

Because much of the water-soluble vitamins and most of the minerals can pass out into the water in which food is cooked, very little water should be used in cooking. If any water is left, it should not be thrown away but should be kept in a soup pot. I have frequently seen housewives drain the liquid from a can of peas or beans, pour on large quantities of fresh water, boil the already-cooked vegetable much longer than necessary, and again pour the second water into the sink. A famous physician has made the statement that if kitchen sinks had heart and lungs, they would be the best-fed animals in America.

Cook vegetables in as little water as possible. Salt many of them a few minutes before removing them from the stove, because salt takes the water and flavor, and much of the vitamins, out of vegetables. Cook them until they are soft, but not a minute longer.

The ideal method of cooking is in heavy, covered metal utensils, below boiling temperatures and without the addition of water. Such utensils are sealed by water, which prevents the entrance of oxygen, thus preserving the natural colors, flavors, and vitamins. The low temperatures and quick cooking further prevent the destruction of vitamins. In the usual method of cooking, 40 to 50 percent of the mineral salts in vegetables is lost, for all minerals are soluble in water; in this method there is no water to carry away the minerals.

Unless the simple rules in cooking are observed in

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everyday life, one cannot expect to reach optimum health.

Summary of Iron

Function in the body: aids the blood to distribute oxygen to all body cells.

Results of a deficiency: anemia, or blood which is pale in color.

Sources: calves' liver, beef liver, spinach, lean beef, egg yolk, watercress, parsley, chard, whole-grain breads and cereals.

Summary of Copper

Function in the body: assists iron in the formation of blood.

Results of a deficiency: anemia.

Sources: calves' liver, oysters, beef liver, lobster, wheat bran, pork liver, apricots, egg yolk, green leafy vegetables.

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Chapter 12

ALKALINE-ASH AND ACID-ASH FOODS

Just as it was fashionable to have colitis in *The Story of San Michele*, so is it fashionable now to have acidosis. One can scarcely turn the dial of the radio without being bombarded with the harms and "cures," mostly the "cures" of acidosis.

Very frequently a patient makes the statement, "I have acidosis," or "I have too much acid in my system." By such a statement, one person means that he has active tooth decay which the dentist has rightly said is due to the formation of acid in his mouth. Another means that he has gas in his stomach; as this gas escapes, he has a slight taste of hydrochloric acid from his stomach, so necessarily a factor in normal digestion. The third has heard the term acidosis, and without knowing its meaning, decides that it refers to the eating of "acid foods." Therefore, he usually denies himself his only good source of vitamin C. These misconceptions have nothing to do with acidosis.

When wood or coal is burned, ashes are left. Likewise, when natural foods are burned or utilized in the body, ashes remain. In this case the "ashes" are valuable minerals, needed in large amounts if one is to reach optimum health.

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The ashes from burned foods are chiefly made up of calcium, magnesium, potassium, sodium, phosphorus, chlorine, sulfur, and iron. When calcium, magnesium, potassium, and sodium are more abundantly supplied in a food than are phosphorus, chlorine, and sulfur, the food is said to be potentially alkaline forming. Conversely, if phosphorus, chlorine, and sulfur are more generously supplied than calcium, magnesium, sodium, and potassium, the food is said to be potentially acid forming. Some foods, such as sugar, corn-starch, and highly purified fats, are so refined that no minerals remain after they are burned. Other foods, such as butter, tapioca, and cream, contain a balance of the two types of ash. The foods which contain no ash and those which contain a balance of the two types of ash are therefore said to be neutral foods.

The reason for saying a food has an alkaline, acid, or neutral ash is this: in the chemist's laboratory, minerals such as those in foods form acids or bases, or if mixed in equal proportions, neutral salts. For example, the chemist can use calcium, magnesium, potassium, and sodium to form bases, or calcium hydroxide, potassium hydroxide, and sodium hydroxide. Likewise, he can form acids from phosphorus, chlorine, and sulfur, converting them into phosphoric acid, hydrochloric acid, and sulfuric acid. The chemist, however, can use these minerals for many other purposes than to form their respective bases or acids. For example he can make common table salt, sodium chloride, from sodium and chlorine. So it is with your own chemistry laboratory,

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the body. Just because these minerals can be formed into acids and bases, it does not follow that they are actually formed in the body. We have seen how calcium and phosphorus are needed to build and maintain the health of the teeth and bones. These are used probably as a neutral salt of calcium and phosphorus.

However, if the chemist is to do his best work, he will see that his stockroom does not contain only acid-forming minerals, such as phosphorus, chlorine, and sulfur. Nor will it contain only alkaline-forming minerals, such as calcium, potassium, and sodium. He will always keep a generous supply of both types of minerals. Similarly, the body, if it is to do its best work, must have a generous supply of both types of minerals.

In experimental animals, greater gains of weight, a higher degree of health, and a more abundant retention of valuable minerals such as calcium and phosphorus result when the diet is so planned as to contain both alkaline-forming and acid-forming minerals to the extent that neutrality is established. Similar experiments on babies indicate that both acid-ash and alkaline-ash foods should be given in order that neutrality may be obtained, if optimum health is to result.

In bringing about a cure for certain diseases, a physician may put his patients on diets which are predominantly acid forming; in treating other diseases, he may use diets which are predominantly alkaline forming. Individuals hearing of such treatments should never adopt such diets for themselves.

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Generally speaking, fruits, vegetables, milk, cheese, and nuts contain larger amounts of calcium, magnesium, potassium, and sodium than of phosphorus, chlorine, and sulfur; they are therefore said to be alkaline-forming foods. Cereals, breads, eggs, meats, and fish contain larger amounts of phosphorus, chlorine, and sulfur than of the alkaline-forming minerals; they are therefore said to be acid-forming foods. Foods which contain either a balance of both classes of minerals or contain no minerals at all, such as cornstarch, sugar, butter and cream, are said to be neutral. There are a few exceptions to this general rule; however, these yield an ash which is very near the point of neutrality.

The taste of food in the mouth is in no way an indication of the mineral matter it contains. For example, orange juice, which tastes acid in the mouth, is very rich in alkaline-forming minerals. This is because orange juice and other citrous fruits contain some free citric acid. This juice also contains much sodium citrate, or a salt of sodium, an alkaline-forming mineral, and citric acid. Orange juice remains acid in the stomach, where it aids the hydrochloric acid in the digestion of foods; it remains acid in the intestines where it aids in the absorption of calcium and phosphorus. Eventually it is absorbed into the blood stream, and is carried, let us say, to the muscles. Here the citric acid is burned, just as sugar is burned. The sodium, which is a mineral and cannot burn, is left to aid the body in neutralizing acids.

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Many years ago, before fruits and vegetables were grown as abundantly, sold as inexpensively, or canned commercially as they are now, people ate large amounts of bread, cereals, meats, and eggs. These foods predominate in acid-forming ash. At that time people undoubtedly suffered to a certain extent from acidosis, which means simply a deficiency of the alkaline-forming minerals. One still finds a person occasionally who eats only ham, eggs, toast, and coffee for breakfast, while meats, rice or macaroni, bread, and pastry make up his other meals. Obviously, such a diet is deficient in fruits, vegetables, cheese, and milk, or foods which give an alkaline-forming ash. In an effort to fight such poorly balanced diets, the pendulum has sometimes swung in the other direction. The faddists have seen their chance to capitalize upon the ignorance of the layman concerning the mineral value of foods. While one hears of acidosis on every hand, there is not one person in a hundred who knows what acidosis actually is.

People have frequently become so enthusiastic about putting themselves on diets which yield a high alkaline ash that they have denied themselves many good foods and often harmed themselves. Whole-grain breads and cereals, egg yolk, and red meats, all rich sources of iron, have been omitted from such diets, yet the amount of anemia in this country is appalling. Whole-grain breads and cereals offer the only appreciable source of vitamin B in the American diet; no single deficiency is so widespread or has led to so many illnesses in this country

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as the deficiency of vitamin B. These, too, have been eliminated from faulty alkaline-ash diets. Let us look at examples of people who have been misled by over-enthusiasm for curing "acidosis":

A man was recently referred to me who had suffered from lack of vitamin B for years. He was extremely thin, had no appetite, was intensely nervous, and suffered from severe gas pain and chronic constipation. He had lived for several months on a diet of only foods which give an alkaline ash. He had of course, substituted no source of vitamin B to replace that he denied himself.

A girl who showed the same symptoms, together with a mild colitis and severe anemia, was sent to me for diet supervision. When I asked what she had eaten for breakfast, she said, "I hate to tell you. I rarely eat it, for I know it's bad for me. Oatmeal." She was referring to the acid-forming minerals in the oatmeal, but she had overlooked the importance of the iron, phosphorus, calories, and Vitamin B it contained, all of which her body greatly needed.

Any authority in the field of nutrition recommends a neutral diet (except in the treatment of certain diseases), even though he may seem to stress a diet high in alkaline-ash foods. He does this because he feels that too many acid-forming foods are eaten without being accompanied with alkaline-forming foods. Dr. Sansum, referring to acid-ash foods, makes this statement, "These foods should be balanced by adequate

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amounts of alkaline foods."¹ Notice that he does not say that acid-ash foods should be omitted.

It must be remembered that fruits, vegetables, milk, and cheese, together with butter and cream which would be eaten if the diet were made predominantly alkaline forming, are somewhat richer in vitamins A, C, and G and in calcium than are breads, cereals, eggs, and meat. Milk and cheese are also such excellent sources of phosphorus and protein that these body needs would not be lacking on such a diet. Even though an improvement in health followed the taking of a high alkaline-forming diet, one is certainly not justified in saying that improvement is due to the alkaline ash alone. The increase in vitamins A, C, and G and in calcium might have improved the health much more than the alkaline ash.

Normal urine is slightly acid, but when persons become over-enthusiastic about eating alkaline-forming foods, the urine may become neutral or even quite alkaline. Minerals such as calcium and phosphorus are excreted daily by the kidneys and these are insoluble in alkaline urine. In this case, the minerals dissolve out of the urine and are frequently left in the kidney. A continuation of such a mineral deposition over a period of time is considered by many physicians to be a cause of the formation of dangerous kidney stones. It is said

1 Sansum. The normal diet, p. 43. 1927 (C. V. Mosby, St. Louis)

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that the formation of kidney stones has greatly increased with the fad of eating alkaline-forming foods.

Acidosis is caused by eating too few fruits and vegetables and not directly by eating too much meat, eggs, breads, and cereals. Eat a diet which predominates in alkaline-forming minerals, if you choose, but be wise enough not to deny yourself excellent sources of iron, phosphorus, vitamin B, and protein.

If you will see that every need of your body is supplied daily, you need never worry about acidosis. The amount of orange juice which should be taken to obtain optimum health will alone cure any acidosis which might have existed.

Summary of Alkaline-ash and Acid-ash Foods

Alkaline-forming foods: fruits, vegetables, milk, cheese, nuts.

Acid-forming foods: breads, cereals, eggs, meats, fish.

Neutral foods: butter, cream, sugar, tapioca, corn-starch, lard.

For optimum health: a balance of alkaline-forming and acid-forming foods, resulting in approximate neutrality.

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Chapter 13

FOOD CLASSES

All foods, totally aside from their vitamin and mineral content, are divided into fats, carbohydrates, and proteins.

Of these classes, proteins are the most likely to be either undersupplied or wrongly supplied. The chief sources of proteins are milk, cheese, eggs, meats, fish, cereals, breads, and dried beans and peas. When these foods are eaten and digested, they are broken down into amino acids. Some of these amino acids are essential to growth and health, while others are less needed by the body.

The protein foods which contain all the essential amino acids are adequate proteins, while those which lack certain amino acids are inadequate proteins. Adequate proteins, or those which are said to have a high biological value, are milk, cheese, eggs, meat, and fish. Examples of inadequate proteins are cereal grains, gelatine, dried beans, peas, and lentils. However, if the foods of the latter group are eaten with those of the former, which supply the missing amino acids, as when bread is eaten with meat, cheese or milk, cereal with milk, eggs and milk with corn, bread, or rice in pudding, the inadequate proteins become extremely

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important. For example, a large serving of cooked cereal supplies the same amount of protein as two eggs.

Each day the body needs a certain amount of protein for building and repairing muscles. Obviously, its protein needs are greater during growth than adulthood. Although the body requires less protein as one becomes older, modern scientific research seems to point to a liberal rather than to a restricted protein intake. This is due not so much to the protein itself in these foods, but to the valuable vitamins and minerals contained in many protein foods. Adults undoubtedly need more vitamins B and G, more calcium and iron, and perhaps more phosphorus than they take at the present time. These substances are found in milk, cheese, eggs, red meats, and whole-grain breads and cereals.

From my observation women are much more likely to eat insufficient amounts of protein than are men. The average man has one or two eggs for breakfast, while his wife eats none. A man's lunch usually includes meat; frequently his wife has only a vegetable salad. Nine times out of ten the husband eats a larger serving of meat for dinner than his wife cares to eat. He is less likely to be trying to reduce than she, and therefore eats more breads and cereals. All too often neither of them eats sufficient cheese and milk. As a result, her diet is lower than his not only in protein, but also in calcium, phosphorus, vitamin B, and iron. We

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have seen that her iron requirement is proportionately higher than his.

Since protein is harmed by long cooking, quickly cooked cereals are to be preferred to long-cooked cereals, rare meats to overdone meats, and untoasted bread to toasted bread.

If one quart of milk, some cheese, one egg, possibly one serving of meat, and a small amount of bread and cereal are eaten daily, the protein needs of the body will be amply supplied.

Fats (butter, cream, oils, lard, and shortenings) and carbohydrates (starches and sugars) are used in the body chiefly to furnish heat and energy. Usually, people's taste prompts them to choose four or five times as much carbohydrates as fats in their diets. Aside from having sugar in the diet to burn fat, the body does not seem to require any definite ratio between these two classes of food (see acetone acidosis, page 179). It must be realized that though these foods yield energy for the body, they are not energizing. The person who eats a box of candy certainly does not feel like dashing off to a game of tennis.

In planning your diet, choose foods which give you the "most for your money." Almost all foods give you either fat or carbohydrate; therefore, it is not so important that you choose them for their fat and carbohydrate content as for their vitamin and mineral content.

When any food is burned in the body, heat or energy is liberated. The measure of this heat is called

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a calorie. Weight for weight, pure protein and carbohydrate give the same amount of fuel, or four calories per gram, while fats give more than twice as much, or nine calories per gram. When a food is small in bulk and can liberate large amounts of heat in the body, it is called a high calorie food. Such foods are stressed in the gaining diet; for example, cheeses, nuts, cream, butter, and other fats. Conversely, when the bulk is large and the food gives little heat in the body, it is called a low-calorie food. Examples of these foods are skim milk, leafy vegetables, soups, and certain fruits. As any overweight person who has ever tried to reduce can readily tell you, there is hardly any food which does not contain calories. There is, strictly speaking, not one food which can "make you thin." It is only that certain foods are less fattening than others.

There is only one thing which I consider sufficiently important for the average person to remember about calories: that is, there are calories and calories. Such foods as milk, orange juice, wheat germ, and fish-liver oil, contain calories as well as many valuable minerals and vitamins which are essential to health. There are other foods, such as sugar and refined fats, which have absolutely nothing to offer the body aside from calories. The wise person chooses the food which has the most to offer him.

Because food classes and calories have been discussed in detail in many other publications, further information is not given here (see references).

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It is estimated that the normal individual needs between two and three quarts of water daily. Just as there are calories and calories, so is there water and water. All liquids are largely water. I usually ask patients to drink a quart of milk and two glasses of orange, grapefruit, or tomato juice daily. These foods, together with soup, tea, coffee, ice cream, jello, and other liquids which the average person enjoys taking, and whatever amount of water he may want to drink, supply him with a sufficient amount of liquid. Many vegetables and fruits are also 80 to 97 percent water.

This is not an argument against water, but rather a plea for the use of more orange juice, milk, fruits and vegetables. Some liquids carry more health-giving substances than does water; the conviction that the drinking of large amounts of water daily is necessary might easily cause these more important foods to be crowded out.

Consider every factor which a food has to offer you. Then eat the foods which offer you the most.

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Chapter 14

PROPER ELIMINATION

Proper elimination is essential to good health. Conversely, the taking of cathartics is exceedingly harmful to health. Yet the American people are said to spend more money each year for cathartics than they do for education.

While there are many factors which are necessary to stimulate normal elimination, in this country the lack of vitamin B is undoubtedly the outstanding cause of constipation. Vitamin B controls the health of the nerves, and healthy nerves, in turn, command the muscles in the walls of the intestines to work normally. Vitamin-B-starved nerves, however, cannot command these muscles to work efficiently, and the waste material is allowed to remain in the colon and rectum until it becomes hard and dry.

When solid foods are eaten, they are mixed with the liquids which are drunk and with digestive juices to such an extent that the food mass in the stomach is in a semi-liquid state. The food then passes on into the small intestine and is there mixed with more liquid digestive juices. When healthy nerves command the muscles in the walls of the intestines to work normally, the waste matter is passed on

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through the large intestine without the delay which causes water to be largely absorbed from it; hence the stools are soft. Consequently there is no trouble with constipation nor need for cathartics.

The amount of time it takes food to pass through a healthy person's body varies to some extent with each individual. A small meal leaves the stomach in from one to four hours after it is eaten, while a large meal may take from four to seven hours. The food mass remains from twelve to eighteen hours in the small intestine, or perhaps longer. Still in the semi-liquid state, it passes on into the large intestine, or colon, where it normally stays two, three, or even four days. Here the final food absorption takes place, and the stool is formed which is gradually forced into the rectum.

If a normal person mixes a bit of charcoal with his food in order to mark the feces, a small amount of the charcoal will appear on the third day, a much larger amount on the fourth day, and again a small amount on the fifth day, showing that it takes approximately four days for the food to pass naturally through the body. On the other hand, if the charcoal is taken together with a cathartic, it will appear on the same day or on the following day, depending on the strength of the cathartic.

A bowel movement which follows the taking of a strong cathartic consists of the residue from foods eaten three and four days previously, the incompletely absorbed food and residue of the meals eaten two days

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previously, the partly digested and partly absorbed foods eaten during the previous day, and often the wholly undigested food eaten the day the cathartic was taken.

Obviously, this bowel movement is some four to six times greater in bulk than a normal bowel movement would be. Still it misleads the average person into believing that each day's bowel movement should be of an equal bulk. Totally without any consideration of the amount or kind of food eaten, such a person concludes that he is constipated if his stools are smaller than he has thus come to expect.

After a cathartic is taken, there can be no bowel movement until the third or fourth day following, for it requires three or four days for food to pass normally through the body. However, people have been trained to believe that it is necessary to have a bowel movement daily. By the end of the second day the person becomes worried; by the third day he is much concerned about himself; by the fourth day, when in all probability he would have a normal bowel movement, he will have taken another cathartic, if indeed he waited so long. Thus the cathartic habit is formed. Such people say that they are constipated, when actually they may not have given themselves a chance to become constipated for years.

The popular belief that a daily bowel movement is necessary has largely come from the reading of so many cathartic advertisements. These advertisements have

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obviously been written by people who want your money far more than they wish to improve your health.

One bowel movement daily is normal for people who eat an adequate diet. This, unfortunately, does not include everyone.

Constipation means, not an infrequent stool, but a hard stool; not a small stool, but a hard stool. I repeat this purposely because so many people do not know the meaning of constipation, and realize still less the harm they may be doing themselves by a continuous use of cathartics. Cathartics should never be taken except when recommended by a physician in an emergency.

While cathartics are harmful in many ways, they are particularly harmful in that they push the food through the body before the minerals, vitamins, and other substances which the body needs are properly absorbed. Studies have shown that the feces following the taking of some cathartics contain almost 100 percent of the food eaten. The fact that constipation exists indicates that your diet is not adequate. A continuous even though a partial loss of whatever valuable food substances you are eating will result in time in a much lower degree of health.

I recall one of the professors of a nutrition class at the University of Wisconsin saying to us, "If a person had only one bowel movement a month, and the stool was soft, he would not be constipated."

Frequently, following an operation of the rectum, a patient is given food containing no residue in order

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that bowel movements can be avoided for as long as ten to twelve days. While there is much proof that the use of cathartics is harmful, there is little proof that two or three days without a bowel movement will harm your health. In any case, the two or three days will be less harmful than taking of a cathartic.

Constipation should be avoided, and it can easily be avoided by an adequate diet rich in vitamin B. If experimental animals which have been fed an adequate diet including vitamin B are autopsied, little running waves of contractions or peristalsis, which are necessary for normal bowel movements, continue in their intestines for about fifteen minutes after the animals are killed. In similar animals, whose diets have been identical in all respects to those of the normal animals except that no vitamin B has been given them, there will be few or no contractions, or perhaps one or two very sluggish running movements if the intestines are mechanically stimulated by the prick of an instrument. Similarly, Americans, using diets low in vitamin B, have sluggish mobility of the intestines which leads to constipation.

However, lack of vitamin B is not necessarily the whole story of constipation. The diet should, of course, be adequate in all other respects as well.

The use of large amounts of milk is an important factor in overcoming constipation. Milk sugar increases the growth of favorable bacteria in the intestines. A normal stool contains about 80 percent water and

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20 percent solid matter. The solid matter, although it contains some roughage or cellulose, is largely dead bacteria. Because milk increases the growth of bacteria in the intestines, more bacteria are excreted in the stool and the size of the stool increased over that resulting from a diet deficient in milk.

In a study made of factors which influence the size of the stool, a certain diet was given patients. To this was added at first a pound of fruit, high in bulk or roughage. Later a quart of milk was given instead of the fruit. The stool resulting from the diet plus milk was equally as large and soft as when the bulky fruit was eaten.

There is a popular misconception that milk is constipating. Before the use of pasteurized milk became general, milk was sometimes dirty and infected. Such milk often caused diarrhea. Since boiling the milk killed the germs which cause diarrhea, boiled milk was naturally recommended. Thus developed the misconception. It should be noted that the boiled milk was not given to cure diarrhea, but to prevent further attacks of diarrhea.

Milk is not constipating. Quite to the contrary, milk sugar is definitely laxative.

In order to overcome constipation, nothing more than an adequate diet need be given. This may be augmented by increased amounts of vitamin B, milk and milk products, and by additional fruits and vegetables.

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The drinking of large amounts of water has been found to have very little or no influence upon the moisture content of the stools. However, the taking of small, frequent meals has been found to relieve constipation much more quickly than the same amount of food taken in a few larger meals. This is explained by the fact that each time food is eaten peristaltic movements are set up in the intestines. Undoubtedly the frequent drinking of water would have somewhat the same effect, though to a lesser extent, as the small, frequent meals.

Constipation can and should be cured by an adequate diet. The person who uses cathartics regularly is inviting ill health, because vitamins, minerals, and other substances needed by the body are eliminated before proper absorption can take place.

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Chapter 15

BUILD A STRONG CHAIN

There is one underlying rule upon which all diets must be built. Regardless of whether the diet is for a well person or an ill one, whether for a baby or a centenarian, this rule must be applied if the diet is to be adequate. The rule is as follows:

Every requirement of the body must be met. This means that every vitamin, every mineral likely to be deficient, enough carbohydrate to utilize the fat properly, and an adequate amount of protein of high biological value must be checked and amply supplied.

These requirements cannot be met without furnishing minerals which will give both an acid ash and an alkaline ash. These body needs cannot be fulfilled without fats and carbohydrates, and thus calories, being furnished. The number of calories needed by each person can easily be adjusted to meet his individual needs.

If any food needed to supply body requirements seems distasteful to you, learn to enjoy it by eating a bit of it every time you have a chance. If any valuable food seems to disagree with you, build up your nerves and your digestive tract to the place where nothing will disagree with you.

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If any person, be he physician, dentist, dietitian, or nurse, removes from your diet any food which contains vitamins, minerals, or other substances which are necessary to health, something must be substituted which will adequately take its place. Great harm has been done by restricted diets, not because of the foods included on such diets, but because of the foods omitted.

As to denying yourself any good food upon the recommendation of a charlatan, a faddist, advertisements, or any person or concern which does not hold to strict medical ethics, you risk not only your pocketbook but your health as well.

You are rarely harmed by listening to people who tell you that certain foods are particularly good for you, even though they may give you misinformation. Each food, if rightly used, has some place in the dietary. No foods are actually "bad," except when used by certain ill individuals. Therefore, make it a life rule to beware of the advice of the untrained person who tries to tell you that any food is harmful.

Likewise, too much of any one food is rarely harmful, aside from perhaps causing indigestion. One frequently hears, "It was caused by eating too much bread and meat." It is not too much bread and meat which caused the harm, but too little of the other foods. Foods vital to health were crowded out. Not every body requirement had been met by the diet.

People sometimes go on fasts or diets recommended by faddists, as for example, only orange juice for a few

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weeks or even months. Harmful results frequently follow. A diet of orange juice is deficient in vitamins A, B, D and G, phosphorus, iron, and protein. It was not too much orange juice which caused the harm but the deficiencies of other vital factors.

I once heard a patient trying to justify such a diet to her physician. "It is a cleansing diet," she declared.

"A milk pail may be empty, but it does not follow that it is necessarily clean," he replied. "Very little is needed to feed bacteria."

"But it eventually starves the bacteria," she answered.

"Yes, that's true," he retorted. "The bacteria are starved all right. Unfortunately they die a few days after you do."

Such diets cannot be justified, for they do not meet the body's requirements.

One must always bear in mind that any abnormal condition is likely to be due to many deficiencies and not to one deficiency alone. In general, lack of vitamin A is associated with infections. Lack of vitamin B leads to abnormalities of the digestive tract and the general nervous system. An insufficient amount of vitamin C causes weaknesses in the connective tissues of the body, and so on. Usually, however, it is the overlapping of many subtle deficiencies which contribute as causative factors to commonly recognized diseases.

Let us take an ulcer of the stomach or duodenum as an example. There may have been a partial lack

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of vitamin A which caused the cells of the mucous membrane to die and slough off, inviting bacterial invasion in the tissues. There may have been inadequate vitamin B which resulted in thin unhealthy walls of the stomach or duodenum, together with stagnant food which nourished the growth of millions of bacteria throughout the intestines. A lack of vitamin C may have caused the connective tissues between the cells of the stomach or duodenal walls and walls of the blood vessels to break, resulting in an open sore or ulcer and possibly hemorrhage. The broken tissue (lack of vitamin C) likely occurred where bacteria, nourished on stagnant food (lack of vitamin B), had infected unhealthy mucous membrane (lack of vitamin A). Such a circle can easily become a vicious one. These may indeed be only part of the causative factors which lead to ulcers. However, all of these subtle deficiencies, coming at the same time and overlapping, can be sufficient in themselves to result in an ulcer.

I frequently meet people who proudly tell me that they eat wheat germ every morning; mothers often stress with satisfaction that each of their children drinks an entire quart of milk daily; another person never misses his quota of orange juice, while others are little less than fanatics about sunbaths. In these cases one usually finds that one or two important factors have been stressed, and this is excellent. However, one almost invariably finds that there are other body requirements which are either inadequately supplied or are

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completely lacking. These requirements which are omitted are of equal importance.

Every factor which makes for the well-being of the human body must be weighed for its relative importance to you as an individual. Those body requirements which seem to have been lacking or inadequately furnished in your case must now be supplied most generously. Yet every requirement needed for optimum health must be amply furnished, and none omitted.

The human chain is as strong as its weakest link.

Chapter 16

THE GOAL OF OPTIMUM HEALTH

At first all of these requirements for optimum health seem confusing. Let us make out a day's dietary:

1. One quart of milk, either whole or skimmed.
2. Wheat germ or yeast, and whole-grain breads and cereals to the exclusion of all others.
3. Some form of fish-liver oil; at least one tablespoonful of cod-liver oil or its equivalent in other fish-liver oils.
4. Sixteen ounces of orange, grapefruit, or tomato juice.
5. One serving of cheese.
6. One or more eggs.
7. One serving of meat, fowl, or fish. Liver and some type of seafood should be served at least once a week. With eggs and cheese daily, the meat is not absolutely necessary.
8. Three or more green or yellow vegetables.
9. Three or more fruits beside the fruit juice. Colored fruits should be used more frequently than colorless ones.

Now that we have the daily program outlined, let us analyze it in order to check the results. It must stand the test: every body requirement must be met.

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1. Vitamin A: fish-liver oil, colored fruits and vegetables, cheese, and egg yolk. Cream, butter, and liver augment the vitamin-A intake, but these may not be eaten daily.
2. Vitamin B: wheat germ or yeast, whole-grain breads and cereals.
3. Vitamin C: orange, grapefruit, or tomato juice.
4. Vitamin D: fish-liver oil, vitamin-D milk if it is used.
5. Vitamin E: wheat germ.
6. Vitamin G: milk, cheese, egg, meat, yeast if it is used.
7. Calcium: milk and cheese.
8. Phosphorus: milk, cheese, meat, fish, egg, whole-grain breads and cereals.
9. Iron: egg yolk, red meats, whole-grain breads and cereals, wheat germ, green vegetables.
10. Copper: egg yolk, vegetables, seafoods.
11. Proteins: milk, cheese, meats, fish, eggs, whole-grain breads and cereals.
12. Bulk or roughage: fruits, vegetables, whole-grain breads and cereals.
13. Liquids: milk, fruit juices, tea, coffee, soups, and other food liquids; any amount of water you may wish to drink.

Your caloric intake need not concern you unless your weight is abnormal.

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Your next problem is to get these foods worked into daily menus.

Breakfast

orange, grapefruit, or tomato juice, 8 oz.
fruit, colored
wheat-germ cereal and milk
egg, if desired
whole-grain bread
coffee, tea, or milk, as desired

Lunch

egg, if none for breakfast; or cheese or meat, if desired
1 to 3 vegetables or a salad
milk
whole-grain bread
fruit

Dinner

soup, if desired
meat or meat substitute
2 or 3 vegetables
salad
whole-grain bread
milk
fruit
cheese and nuts

The remaining glass of milk and fruit juice can be taken as desired in the morning, afternoon, or before retiring. This, of course, is merely a suggested outline, and may easily be adjusted to one's preference.

This dietary is by no means to be considered iron-clad. Obviously, the food of a sixty-year-old man must be different from that of a baby, and that of an ill person from that of a healthy individual. Nevertheless, our rule that every body requirement must be met holds good in every case. Every person, regardless of age or degree of health, needs certain vitamins, minerals, and adequate protein. Fortunately, there is a most

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inexpensive and best source of each body requirement; therefore, almost all diets are basically much alike. However, the diet for each individual should be "tailor made." In other words, it must be adjusted to meet his particular problems.

Authorities in the field of nutrition suggest that in order for you to buy sufficient amounts of foods which are most important to health, the food budget should be divided approximately in fifths. One-fifth or more should be spent on cheese, butter, milk and cream. One-fifth or less should go for meats, fish, and eggs; more is usually spent on meats than the health-giving value of them warrants. One-fifth or less should buy cereals and bread; let us add wheat germ here. One-fifth or more should be spent on fruits and vegetables. The final one-fifth or less should supply the fish-liver oil, fats, seasoning, and other foods not mentioned above.

You will find it just as easy to buy correctly as to buy incorrectly. You will find it more pleasant to eat wisely than to eat unwisely. You will be much happier in optimum health than in average health.

The best sources of the body requirements are recommended here in somewhat larger amounts than in the average book pertaining to nutrition. I do this with no attempt to be sensational. My reasons for recommending sources richer than those which are usually recommended are based on scientific experiments and on clinical findings of workers in this field.

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The dietary which is considered adequate according to accepted current standards will perhaps keep you in average health, but it has made little plea for that far-above-the-average standard of well-being.

Let us look at a family who are eating adequately according to these accepted standards. The mother has a mild case of pyorrhea. Alice is susceptible to headaches. John has a slight cold, and has missed five or six days of school at different times this year. Jack, who is some eight pounds underweight, has pimples on his face. "It's just the stage he's going through." Henry has already had three cavities in his six-year molars. Father comes home dead tired every night, is much more nervous than he should be, and is often irritable with the children.

No member of the family is actually ill, yet no member is in optimum health. The standards of their "adequate" dietary are too low.

Great strides have been made in the improvements of our diets. For example, a few years ago rickets, a disease of the bones and teeth, was so prevalent as to be found in 96 percent of the babies in large cities. Because of the widespread use of vitamin D during the last five or six years, the severe cases of this disease have been almost completely wiped out. This progress shows what can be done by adding just one factor to the diet.

The condition of the teeth and gums, to a large extent, is a mirror to the health of the body. Decayed teeth and infected gums are so common now as to be

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the rule rather than the exception. Nevertheless, dentists say the teeth of children of this generation are better than those of the last.

So it is that progress is being made. The goal of preventive medicine and preventive dentistry, the goal of optimum health, has by no means been reached. Millions of people are ill. Millions more are on the borderline between sickness and fair health, and these people realize they are not "up to par." Millions more consider themselves healthy though they actually suffer all kinds of minor illnesses which may lead to conditions far more serious. If one faces the facts honestly and sincerely, he realizes that a very small percent of our population can be considered in optimum health.

With slight changes in diet, most of those who are almost well could enjoy optimum health. Many who are on the borderline could become healthy. A large percent of those who are ill could be cured. May your desire to avoid their illnesses be an incentive to you to observe the simple dietary rules which will lead to correct body nutrition.

The greatest emphasis must be placed on keeping the already healthy person healthy. All sick people were probably healthy at some time in their lives. If they had seen the wisdom, and known how, to make every effort to remain in good health, there undoubtedly would be less illness today. Observe people around you, perhaps those older than yourself. Look for appearances of age and of poor physical health which could have been prevented. Are you going to let yourself be-

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come as they are? Do they have diseases which you yourself may someday have, but which planning, forethought and carefully selected food could prevent? If you are in good health, preserve it, for it does not stay with you without your striving to keep it.

Let this be an incentive to you: the knowledge that optimum health will do much toward bringing you mental health. Let us first look to Karl A. Menninger for a definition of mental health.¹

"Let us define mental health as the adjustment of human beings to the world and to each other with a maximum of effectiveness and happiness. Not just efficiency, or just contentment—or the grace of obeying the rules of the game cheerfully. It is all of these together. It is the ability to maintain an even temper, an alert intelligence, socially considerate behavior, and a happy disposition. This, I think, is a healthy mind."

How many of the factors he mentions here are undeniably attributes of a sound, healthy body!

Let this be an incentive to you: that you can know the pleasure which comes from sheer physical well-being; muscles which urge the body into activity; skin which tingles and glows; vigor which makes you work as hard as you play and which carries you through the day with mind keen and alert; nerves which are steady; digestion which is forgotten; an optimism which carries you over difficulties. These are only a

1 Karl A. Menninger. *The human mind*. 1930 (The Literary Guild of America)

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few of the rewards of optimum health. These joys can be yours.

Let us never be content with average health. Let us push onward to a goal far greater, the goal of optimum health, that far-above-the-average health for all.

Chapter 17

THE FUN OF REDUCING

Whenever patients have been referred to me for reducing diets, I have asked them if they have tried to reduce before. The majority of them have. Then I ask, "Why did you become discouraged?" From their answers to this question, I have been able to build the reducing program given here.

A good reducing diet must fulfill manifold requirements. It must, first of all, give you so much to eat that you will never be hungry. It must prevent wrinkles and haggard faces. It must keep you free from acidosis. The foods must be easy to prepare, inexpensive, palatable, and attractive. The diet must prevent "cravings" by providing you with every need of your body.

In the final analysis, there is only one correct way to reduce. That is, of course, by adopting a reducing program which considers your health above all else. It must not only preserve your present health; it must improve your blood, teeth, bones, digestion, elimination, skin, and muscle tone; it must build up your nervous system and your resistance to disease; in other words, it must increase your health at the same time it decreases your weight.

Your foods should be those so generally used

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that you can be unconscious of "being on a diet." Always keep in mind that you are eating the foods chosen all the time by thousands of slender people because they enjoy these foods best. You too can soon learn to like these non-fattening foods better than any others.

Reducing can be, and is, fun. It's all in the way you look at it.

You will soon find that foods you thought you disliked are delicious. You will take pride in your new will power, for you know you can refuse fattening foods. You will have a feeling of superiority whenever you see a fat person who is too lazy to reduce. You will enjoy getting on the scales and seeing that you have lost two or three pounds in one week. As soon as you have lost to the point where the fun of losing is greater than the slight fun of eating, the rest of your program will be very easy. It will be a joy to look at yourself in the mirror and to buy new clothes. But these are only minor pleasures which are in store for you.

As you near your goal, the greatest joy of all will be yours: an entirely new physical freedom. I cannot describe it to you, for it must be experienced before it can have any meaning. But this feeling of freedom is worth every ounce of effort it takes to reduce.

This joy comes from the fact that your body is relieved of the heavy load of pounds and pounds of fat. You will be thrilled with a feeling of utter well-being; the rhythmic movement of muscles under the skin; a

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fast game of tennis; a graceful plunge into cool blue water; the easy buoyant swing of a long stride on a mountain hike. Probably never before have you known such delight from sheer muscular movement. Suddenly you discover this reward to be yours. You will have reached, I hope, your optimum health.

Yes, there is fun a-plenty in reducing. But why should I tell you? You will be experiencing it yourself before long!

Chapter 18

PRELIMINARY REDUCING DIET

Overweight people eat more food than their bodies need; hence the surplus is stored as fat. This statement remains true even though they may eat a small amount of food compared to that eaten by a slender, more active person.

A reducing program is made easier if you spend at least the first three days eating only the foods which are necessary to furnish your body's vitamin, mineral, carbohydrate, and protein requirements. This small amount of food accustoms you to a feeling of light pressure on the walls of your stomach at the end of a meal. After a few days, you will obtain a sense of fullness by eating only a little food. You must learn the truth in this statement: the more you eat, the more you want to eat; the less you eat, the less you care to eat.

During this time, your foods must be more carefully chosen. You have known people—if indeed you have not been guilty of it yourself—who put themselves on “diets” of almost nothing for a few days. At the end of the third or fourth day, if not sooner, the “diet” was forgotten, and they were eating all the fattening foods they wanted. Although it can possibly not be proved

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scientifically, what undoubtedly happened is this: the self-imposed diet did not meet the body's requirements; the same instinct which causes animals to walk, if necessary, a hundred miles to a salt lick, has caused these people to give up their diets in order to get the foods their bodies require.

If your diet contains every requirement of the body, you will not have this desire to eat foods which are forbidden. While you may still have an appetite, you will not have "cravings."

The following foods, first of all, build health; second, they give you a minimum caloric intake; third, they make the reducing program easier for you by preventing "cravings." Leave any one of them out, without an adequate substitute, and you are doomed to failure.

The first requirement of any good reducing diet is a quart of skim milk daily. I do not refer to whole milk with the cream poured off, but to milk which has been put through a cream separator. This can be obtained from any dairy which sells whipping cream.

Skim milk is not fattening, yet it contains all of the value of whole milk except for the vitamin A and the calories in the cream. Milk is the only liquid which turns into a solid in your stomach, where it stays an appreciably long time. You cannot have hunger pains as long as there is a solid food in your stomach. Milk furnishes inexpensive and easily assimilable forms of calcium, phosphorus, and protein. It is extremely rich in vitamin G, the vitamin which is to prevent your

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becoming wrinkled. Milk is so important a factor that it is not safe to recommend a reducing diet without it.

In addition to your quart of milk, you must have daily either two cups (sixteen ounces) of tomato juice or one cup (eight ounces) of either orange or grapefruit juice, or the equivalent in fresh oranges, grapefruit, or tomatoes. The whole fruit will fill you up more than the juice, but the juice has the advantage of being measured more accurately. Tomato juice contains fewer calories, even when twice as much is taken; however, both orange and grapefruit juice offer a higher content of vitamin C, the vitamin which builds healthy connective tissues and prevents you from bruising and your gums from bleeding. For the sake of avoiding monotony, most people prefer to eat one small grapefruit, three small juice oranges, and about six ounces of tomato juice or canned tomatoes or a raw tomato salad.

You may have black coffee and clear tea in moderation, bouillon made from bouillon cubes, or clear fat-free chicken, beef, and lamb broth.

In order that every requirement of your body can be met, you must have some form of fish-liver oil. Halibut-liver-oil and cod-liver-oil concentrates are the best on the market at the present time and can be purchased in tasteless capsules at every drugstore. These are not fattening. There are 4000 calories in a pound of fat. One capsule contains about two calories. You would have to take 2000 of them before you could gain one pound. Of course, if a thin person who was very nervous, and thus used up large amounts of food, or

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swallow them, for you have swallowed pieces of steak who had infections which decreased his appetite, took these capsules until his nervousness was overcome and his infections cured, he might gain. The capsules, however, would not be the direct cause of his gaining.

Buy fish-liver-oil capsules which contain no Viosterol, unless advised otherwise by your physician or dentist. Take two or three of them daily. They may all be taken at one time, for they are not medicine.

The milk, orange, grapefruit, or tomato juice and the fish-liver-oil capsules take care of all the body needs except one, namely, vitamin B. This vitamin makes for normal digestion by controlling the health of the nerves. The only appreciable source of vitamin B in the American diet is whole-grain breads and cereals, which are now denied you. Sufficient amounts of vitamin B, at best, are difficult to obtain from ordinary food sources, and this is particularly true of a source for an obese person. There are two excellent sources, however, either of which you can use: brewers' yeast tablets and wheat germ.

Brewers' yeast tablets can be bought at every drug-store. Buy a tablet which has been accepted by the food council of the American Medical Association. Ideally, you should take enough of these tablets to equal one tablespoonful of brewers' yeast, which means at least six daily, though eight or twelve would be still better. These can all be taken at the same time, for they are not medicine. Do not say that you cannot

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for years which are many times larger than these tablets. Yeast tablets are cheaper if they are bought in bottles of one thousand.

Wheat germ can be purchased at any flour mill. If you choose this source of vitamin B, cook it a few minutes and eat it with skim milk as a hot cereal. You may eat it as a cold cereal if you like, or in orange juice or milk. Take two or three level tablespoonsful daily.

Yeast is more expensive, but contains fewer calories than wheat germ. Both yeast and wheat germ are somewhat laxative. Since there is little bulk on this diet, do not expect a bowel movement more often than every two or three days. Remember that constipation means, not a small nor an infrequent stool, but a hard stool. Do not take cathartics at this time, or at any other time for that matter, as they push the food through the body before the vitamins and minerals are properly absorbed.

If you wish to stay on this diet longer than three days, modify it by adding two servings of leafy vegetables and one serving of fat-free meat or one egg. Choose your meats and vegetables from those allowed on the more generous reducing diet. With these simple additions, the program is not difficult to follow and may be safely continued for several weeks if one is eager to lose weight rapidly. I recall a patient who was extremely obese, and because of a heart condition, needed to reduce as quickly as possible. She stayed on this diet, with the exception of large amounts of vitamin B, for three months, losing 58 pounds.

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During this time you must eat something every two or three hours. Your daily schedule might be somewhat as follows:

8 A. M.

2 tablespoonfuls of wheat germ with a half cup of milk; or
6 to 10 yeast tablets
2 or 3 fish-liver-oil capsules
half a grapefruit
1 or 2 cups of black coffee; more if it is weak

10 A. M.

1 small juice orange

12 A. M.

1 cup of broth
1 glass of milk
(vegetable)

2 P. M.

4 ounces of tomato juice

4 P. M.

tea, if desired
1 glass of milk

6 P. M.

bouillon
4 ounces of tomato juice
(meat or egg)
(vegetable)
1 glass of milk
1 small orange

Before retiring

remainder of quart of milk

With the possible exception of iron and protein, this diet is far superior to that eaten by the average person who is not even trying to reduce, for it furnishes the needs of the body more adequately. It will not hurt the health. It will probably improve the health.

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Let us summarize and check this diet. You must have daily:

- | | |
|---|--|
| 1 quart of skim milk..... | calcium, phosphorous, protein, vitamin G |
| 1 cup of orange or grapefruit juice or
2 cups of tomato juice..... | vitamin C |
| 2 or 3 fish-liver-oil capsules..... | vitamins A and D |
| 6 to 10 yeast tablets..... | vitamins B and G |
| or | |
| 2 to 3 tablespoonfuls of wheat germ....black coffee, clear tea, bouillon, broth.... | vitamins B and E to satisfy appetite |

For modified diet:

- | | |
|-------------------------------------|--|
| 1 egg or 1 serving of meat..... | protein, iron, phosphorous, vitamin G |
| 2 servings of leafy vegetables..... | bulk, iron, vitamin A, alkaline minerals |

However, if you cannot follow all the rules of this diet, pass it by and go directly to the general diet.

There are two disadvantages to staying on this preliminary diet for any length of time: first, you are conscious of being on a diet; second, you are not re-training your food habits. Compared to these disadvantages, the advantages are many: you are reducing rapidly; you are becoming accustomed to a slight pressure in your stomach; you are building your health. Best of all, you are learning that the less you eat, the less you care to eat.

Chapter 19

"I CAN'T EAT SO MUCH!"

If we are to enjoy our meals, we want them to be attractively served, luscious to the taste, and sufficient in amount for us to leave the table feeling completely satisfied. Aside from these factors, the average person takes little interest in his food.

An interesting experiment was carried out in a hospital where the patients were totally unaware that they were being observed. One day, very rich concentrated foods were served, so rich that the total daily intake of each person was between 5000 and 6000 calories. On the following day, bulky non-fattening foods were served, resulting in an average total intake of 1000 calories per person. On each day it was found that each person ate a certain bulk or volume of food which gave him a feeling of fullness at the end of the meal. Not only were the patients unaware that they were observed, but they were even unaware that the diets on the two days differed. Since there are 4000 calories in a pound of fat, each patient could have gained about one pound the first day; on the second day, each could have lost one-half pound. On both days the patients were equally happy because the foods were well cooked and

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sufficient in amount to make them feel satisfied at the end of the meal.

Throughout your reducing program eat well-cooked, well-served, delicious food in quantities large enough to keep you satisfied. Eat foods which are low in calories, but try to forget their caloric content.

The foods prescribed on the preliminary diet must be continued throughout your reducing program; in fact, you should continue them throughout life. These foods form the essential foundation of your diet by furnishing your normal daily vitamin, mineral, carbohydrate, and protein requirements.

Besides these foods, you may have small servings of certain fruits. One of the most common mistakes made on reducing diets is that fruits are eaten too liberally. All fruits contain sugar; many contain more sugar than potatoes contain starch. Raw fruits are to be preferred to cooked fruits because you have a tendency to eat smaller amounts of them. For example, if you ate an apple, you would probably feel content with one; if you ate a dish of applesauce you might eat two apples with perhaps added sugar. Raw fruits fill you up more than do cooked fruits, and they stay in your stomach longer.

Vegetables have a similar vitamin, mineral, and bulk makeup to that of fruits, but they contain much less sugar. Therefore, vegetables should be largely substituted for fruits in the reducing diet. Have about two raw salads daily. In addition, have two or three vegetables at each meal if you want them.

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Foods Permitted in the Reducing Diet

Vegetables, generous amounts:

artichokes	escarol	okra
asparagus	green peppers	parsley
broccoli	greens	radishes
Brussels sprouts	Italian squash	spinach
celery	kale	summer squash
chard	leeks	tomatoes
cucumbers	lettuce	vegetable oysters
eggplant	mushrooms	watercress

Vegetables, smaller amounts:

beets	celery root	parsnips
cabbage	cream squash	rutabagas
carrots	Danish squash	string beans
cauliflower	onions	turnips

Fruits, small amounts:

blackberries	lemons	raspberries
cantaloupe	oranges	rhubarb
casaba melon	Persian melon	strawberries
grapefruit	pineapple, fresh	watermelon

Fruits, sparingly:

apples	cherries	peaches
apricots	grapefruit juice	plums
canned fruits (pour off syrup)	grapes	prunes, fresh
	orange juice	tangerines

Meats, generous amounts if fat free:

bacon, crisp, drained	liver	tongue
chicken	mutton	turkey
chops	rabbit	veal
kidney	roast beef	venison
lamb	squab	liverwurst
	steak	wieners

Fish, generous amounts if fat free:

abalone	lobster	shrimps
halibut	oysters	trout
herring	mussels	tuna, washed

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Eggs and cheese, moderate amounts if fat free:

boiled eggs	omelet	coddled eggs
poached eggs	scrambled eggs	baked eggs
souffle	in milk	dry cottage cheese

Soups, generous amounts if fat free:

barley soup,	bouillon	noodle soup,
strained	chicken soup	strained
bean soup	chowder	tomato soup,
strained	lamb broth	home made
beef broth	milk vegetable soup	vegetable soup
beef tea		

Milk: skinned milk buttermilk, strained

Richest Sources of Body Requirements Allowed

Vitamin A:

fish-liver-oil capsules
colored fruits
liver
kidney

Calcium:

milk, buttermilk
cottage cheese

phosphorus:

milk
meats
cottage cheese
fish
eggs

Iron:

liver
oysters
green vegetables
egg yolk

Copper:

oysters
liver
spinach
green vegetables
egg yolk

Protein:

milk
cottage cheese
meat

fish

eggs

Bulk:

vegetables
fruits
milk, by increasing bacteria in intestines

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If you are to enjoy your salads, you must have good salad dressings. However, do not use mineral-oil dressings. Mineral oil causes a loss of vitamins and minerals through diarrhea.¹ Moreover, since it is a fat, it dissolves the fat-soluble vitamins A, D, and E from the intestinal tract, thus preventing their absorption by the body.²

Make a boiled dressing of skim milk, egg yolks, seasonings, and a small amount of flour or cornstarch; thin it with lemon juice to any consistency you prefer. Use any boiled dressing recipe and omit the fat. Lemon, vinegar, or wine vinegar, together with seasoning, makes a palatable substitute for French dressing. To the plain boiled dressing you can add chopped pickle, making a tartar sauce which is delicious on head lettuce. You may add tomato catsup, chopped pickle, hard-boiled egg, green pepper, pimiento, celery, onion, and a bit of garlic if you choose, making thousand island dressing.

You may have fat-free soups in any amounts you want. Make your own soups, so that you know what goes into them. Always buy a soup bone with enough meat on it to give the soup a delicious flavor. Let the soup stand until cold and skim off all the fat. As with your salad dressings, the secret of good soups is the seasoning. Get acquainted with spices and use them.

1. Rowntree. J. Nutrition Sept. 10, 1934

2. Editorial. J. Am. Med. Assoc. Nov. 17, 1934

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Fortunately the protein foods (milk, eggs, meats, fish, and cheese) cannot make you gain if they are eaten fat-free. These foods "stick to your ribs" and keep you from getting hungry.

Dry cottage cheese can be added to combination vegetable salads, moistened with skim milk or salad dressing. If you have only a few pounds to lose, buy the usual cottage cheese to which cream is added. You can have Monterey jack cheese if it is made from skim milk, but be sure you are not buying the whole-milk jack cheese.

You may have meat or fish twice daily if you like. Meats can be dry pan-broiled, broiled before the open fire, or roasted. Roasts can be placed on a mesh cake-cooler so that the fat may drain to the bottom, cool, and be removed, and the meat juices used for unthickened gravies and soups or for seasoning vegetables. Fish canned in oil such as tuna can be placed in a wire strainer and held under the hot-water faucet until all the oil is removed; then it may be chilled and used for salads. Baked fish, stuffed with tomatoes, green peppers, onion, eggplant, and other vegetables, is delicious.

You may have one and sometimes two eggs daily. Hard-cooked eggs stay in your stomach longer than soft-cooked eggs; hence they keep you satisfied longer. If you prefer a soft texture, add enough skim milk to your omelets or scrambled eggs to make a soft consistency; yet cook them well over a low fire. Pour a little milk in the pan before adding the eggs for an omelet or for scrambling, and use no fat. Fresh toma-

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toes, mushrooms, green peppers, asparagus tips, spinach, eggplant, artichoke hearts, or other vegetables, dry cottage cheese, or jack cheese may be added to scrambled eggs and omelets to improve the flavor and increase the bulk.

If you serve enough vegetables, meat, milk, and other foods, you will not need a dessert, although fruit is allowed. It is best, however, to break the dessert habit.

There is a substitute for sugar, saccharine, which is often used on reducing diets. If you use this during the time you reduce, you are very likely to start using sugar as soon as you have reached your ideal weight. Then you will start gaining again. Learn to enjoy the natural flavors of foods.

Four food habits are largely responsible for all unwanted pounds: the dessert habit; the bread-and-butter habit; the cream-and-sugar-in-coffee habit, and the habit of adding fats to vegetables. Break these for a lifetime and your weight problem will be solved.

Foods not mentioned on the diet list are definitely barred from the diet. This includes pork, ham, sausages, salmon, fish canned in oil; candies and sweet desserts; fried foods, gravies, cream, butter, olive oil, nuts, and cheeses other than cottage cheese; starchy vegetables, cereals, and breads. If you have only a few pounds to lose, eat these forbidden foods sparingly. Soda fountain beverages and alcoholic drinks must be omitted if you sincerely want to reduce. Let us see what alcohol would do to an otherwise reducing diet:

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Caloric Values of Liquors¹

	Weight in ounces	Calories
Distilled Liquors:		
California brandy	2/3	65
Cherry brandy	"	62
French brandy, cognac	"	73
Cocktail, dry Martini	2 1/3	131
Gin	1 2/3	116
Liqueurs:		
Benedictine	2/3	88
Chartreuse	"	87
Curacao	"	82
Kummel	2 1/2	61
Rum	"	153
Rum, Jamaica	"	245
Whiskey, American	"	152
Whiskey, European	"	137
American Wines:		
California red	4	95
California	"	89
Sweet Wines:		
Catawba	1	30
Champagne	4 1/2	132
Port, California	1	53
Sherry, California	1	38
Tokay	1	39
American Malt Liquors:		
Ale	8 1/3	153
Lager beer, bottled	"	130
Lager beer, draft	"	120
Porter	"	140
European Malt Liquors:		
Ale	8 1/3	145
Bock beer	"	154
Export beer	"	140
Light beer	"	120
Munich, heavy	"	180
Pilsen, export	"	123
Porter, stout	"	172
Weissbeer	"	103

1. Computed from values given in McLester, Nutrition and diet in health and disease. 2nd Ed. 1931 (Saunders Co.)

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In interpreting these figures, remember that there are 4000 calories in a pound of fat. On the preliminary diet you get about 500 calories daily; on the modified preliminary diet, about 650, and on the more generous reducing diet, between 1000 to 1400. If you carefully follow the rules of the diet, it is difficult to eat more than 1200 calories of the foods allowed you. Add a few ounces of Jamaica rum to your diet, and that diet ceases to make you lose.

However, there is plenty of food to eat without breaking the diet. You may even be saying, "I can't eat so much!" You need not eat everything suggested here unless you desire. You may eat just as little as you choose as long as you get the essentials given on the preliminary diet, and as long as you eat frequently.

Even with the larger amount of food, you must eat between meals, preferably about 10:30 A.M. and 4:30 P.M. These midmeals are extremely important. They prevent acidosis, keep you from getting hungry, and kill your appetite for the next meal to such an extent that you are not likely to overeat. The person who tries to omit them usually never reduces.

The success of a reducing diet depends to a very large extent on your ability to cook well and on your willingness to make the little extra effort in planning your meals. Anyone likes well-cooked and attractively served foods; anyone wants enough food that he will not be hungry. Aside from these things, the average person cares little about what his food contains, be it minerals, vitamins, or calories.

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Watch for variety in preparing salads, soups, meats, eggs, and vegetables. Make any mixture or combination of foods given on the diet which appeals to you. It requires talent to make luscious salads and salad dressings, and to season bouillon so tastefully that your husband will like it in spite of the fact that it is not his favorite and very fattening cream soup. To prepare delicious meals is your supreme test. You can pass this test if your desire to have a healthy, attractive, normal body is sufficiently strong.

Choose well, cook well, and season well. It means the difference between success and failure in your reducing program.

Chapter 20

RAPID REDUCTION

You are now asking, "Is it perfectly safe to reduce rapidly?" Actually, there is not such a thing as rapid reduction, as anyone who has tried to reduce can readily tell you.

Although the popular opinion exists that rapid reduction is harmful, there is no scientific evidence to support this belief. There is much evidence, however, that an improvement in health follows reduction to the point of ideal weight. True, the reducing diets many people have eaten have been so deficient in most of the body's requirements that they could have all but killed the healthiest person alive. Overweight persons have often taken harmful drugs in conjunction with inadequate diets. It is not the loss of weight but the abominable diets and harmful drugs which cause poor health after such reducing.

1 Evans and Strang. Treatment of obesity with low calorie diet. J. Am. Med. Assoc. 97, 1063-68 (1931)

Strang, McCluggage and Evans. Further studies in the dietary correction of obesity. J. Am. Med. Assoc. 178, 687-93 (1930)

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The best scientifically controlled reducing¹ has been done just as rapidly as the patients wished, diets being used as low in calories as 300 to 400 daily, yet with every requirement of the body fulfilled. This means that the greater part of the body's vitamin and mineral needs must be given in concentrated capsule or tablet form.

As eager as you are to reduce, your health is far more important to you than a rapid loss of weight. Your present health must be not only preserved but improved during your reducing program.

An adequate reducing diet is one of the most healthful diets which can be made. This is because foods which offer very little or nothing in the way of minerals and vitamins, such as macaroni, rice, sugar, olive oil, lard, white bread, refined cereals, and the like, are omitted; in order to replace them and to satisfy your appetite, large quantities of such health-giving foods as milk, vegetables, eggs, and meat must be eaten.

For this reason, a good reducing diet furnishes many times more vitamins and minerals than an ordinary, unsupervised diet. The vitamin A in butter, cream, and high-fat cheese is not for the reducing patient, but he can substitute many times more vitamin A in the form of fish-liver oil than the slender person usually gets from these foods. Likewise, the substitution of yeast or wheat germ gives much more vitamin B than a

(Cont.) Wilder. Regulation of body weight. Int. Clin. 1, 30-41 (1932)

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gaining patient could possibly get in the course of the day by eating only whole-grain breads and cereals. In short, a good reducing diet is undeniably superior to the diet eaten by the average slender person.

The factor which must be watched most carefully on any strict reducing diet is an abnormality known as acetone acidosis. Even acidosis is not as harmful to one's health as it is to the disposition. A husband can usually tell the very day his wife goes on a poorly planned reducing diet, for she is irritable and grouchy when he comes home from work. An hour after dinner she is her sweet placid self again.

Sugar is not stored in the body as such except in small amounts. Unfortunately, if an excess of sugar is taken at any one time, it is turned into fat. Fat, which is to furnish you with fuel for heat and energy while you reduce, cannot be burned completely without the aid of sugar. In the absence of sugar, the fat is burned only partially, leaving a residue of certain acids and acid products in the body. When these products have accumulated in sufficient quantities, they cause a condition known as the acetone type of acidosis.

The symptoms of acidosis are unusual weariness, nervousness, headache, dizziness, bad breath (acetone), and even nausea and vomiting. Fortunately, all of these symptoms disappear as soon as you have eaten anything which contains sugar. I have never known a reducing patient who had acidosis to the point of nausea or vomiting. However, tiredness, nervousness, dizziness, headaches, irritability, and bad breath are common

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among reducing patients who are careless about following instructions.

It is absolutely needless to get even the slightest touch of acidosis if you follow directions; if you show these symptoms, it will be entirely your own fault.

Acidosis can be prevented by eating at frequent intervals something which contains sugar. Almost all the foods on your diet contain sugar: skim milk, tomato juice, wheat germ, vegetables, and fruits.

Every time you eat food which contains sugar or starch, a small amount of body sugar, or glycogen, is stored in the body. After a time, this sugar is used up. However, if you eat a large amount of sugar at any one time, the body will change the excess sugar into fat, exactly what we do not want it to do. Still, the body must have sugar to burn the fat. If you eat such small amounts of sugar that there will be no excess to turn into fat, and eat frequently in order that the supply of sugar may be constantly replenished, you need never have acidosis.

You have learned that every body requirement must be met if all cravings for food are to be prevented. Now we add another body requirement, sugar. Whenever exercise is taken, sugar is used. Even though you think you are taking no exercise, your heart, stomach, glands, lungs, and all the involuntary muscles of your body are working. These may use up the small amount of sugar you eat on a reducing diet. The amount of sugar in the blood decreases, and you suddenly become very hungry for sugar, or you have a craving for it.

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Unless your will power is unusually strong, you will eat the first thing in sight, disregarding the fact that it may be chocolate cake. A craving for sugar can be avoided by eating frequently. If you have such a craving, you will have brought it on yourself by not obeying the rules of the game.

You must eat frequently during your entire reducing program, for as long as you are eating foods which contain little sugar, you will be running the chance of having acidosis. Get just one severe case of it, and your enthusiasm for reducing will be over.

I recall a patient who, when referred to me, weighed eighty pounds more than she should. She was told that eating between meals was an essential part of the reducing program. At the end of the week, when she had not reported, I called her on the telephone.

"Your diet's no good," she fairly shrieked at me.

"Why not?" I asked.

"I've never had such a headache in all my life!" she retorted.

"Did you eat between meals?"

"Of course not," she replied. "I'm not such a glutton that I have to eat six times a day!"

I tried to explain why she had had the headache, but she was not interested. Her desire to reduce was gone. So will yours be if you do not eat frequently.

You may, of course, add breads, cereals, and other starches or sweets to an otherwise reducing diet, and thus avoid the necessity of eating between meals. You

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will, however, reduce so slowly that you will become discouraged before reaching your ideal weight.

If while on the preliminary diet you take any strenuous exercise, which will cause the supply of body sugar to be depleted quickly, it is best to eat something every hour. If you are very obese, a two-hour eating schedule is better in your case than a three-hour schedule throughout the reducing program, for the more overweight you are, the easier it is for you to have acidosis.

It is so important to eat frequently during the period you are on the preliminary diet that you should always carry hard candy, such as small lemon, cinnamon, or peppermint drops, with you in case it is impossible to get to the foods on your diet. In this case, eat one small candy every hour.

Frequently eating, particularly when it is a duty, accomplishes another excellent result leading to your victory. Let us suppose you have stayed on the diet until you no longer care to eat. It is time to eat again; you are busy, and hate the interruption. "What a nuisance it is to have to eat all the time!" you say.

You have made progress. The act of eating, in itself, has lost the charm it once held for you.

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Chapter 21

INCENTIVES FOR REDUCING

I doubt that an overweight person exists who does not know that fats, starches, and sweets are fattening. In other words, I do not believe that anyone ever reduced simply because he knew or was given a reducing diet.

There are thousands of people who say weakly to themselves, "I really should reduce," and that is as far as it goes. They lack an incentive strong enough to push themselves out of their lethargy into activity.

More people, I believe, fail in a reducing program because they lack an incentive than from any other one cause. Look for an incentive if you have none already.

Women probably reduce most frequently in order that they may look well in their clothes, and that is an excellent reason. Clothes are important, for they affect one's personality. You are judged by your appearance. Even with twice the effort, an overweight person seldom looks half so attractive as a slender one. The thrill which comes with an unconscious awareness that you are well dressed is worth the energy it takes to reduce.

People cheat themselves out of a great deal of physi-

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cal pleasure by remaining overweight. They are fat-bound. They lack the muscular freedom, the buoyancy, the underlying vitality of a healthy slender person. You may deny this. If you are 50 pounds overweight, then carry a 50-pound weight for just ten minutes. The weight of that 50 pounds is equally as heavy as the fat you carry on your body day after day. At the end of ten minutes, your relief and freedom will be very much the same as that which will come to you when you have reduced 50 pounds. True, you will notice it less, for your weight will be lost gradually. The person who has just completed a health-building reducing program will agree that the feeling of lightness and freedom alone pays for the effort of reducing.

Because a fat person has a jolly exterior, he is generally thought of as happy. He is not happy. He is extremely sensitive about his weight.

The younger a person is, the more sensitive he is likely to be in this respect. The overweight boy or girl at school is a problem child. The child is teased by his classmates unkindly and mercilessly. Many a good fist fight has been fought, and many a sweet disposition ruined because of the nickname, Fatty. Parents are likely to take this matter lightly, thinking the child will outgrow his obesity. Some of the most cooperative reducing patients I have ever had have been children of ten and twelve. They hate obesity, and are willing to work hard for relief.

As years go by, this is an even more harmful factor in the child's life. Obesity throughout adolescence

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and the teen age, when the child is most rapidly developing, may even warp his entire personality. He feels abnormal and draws protectively into himself. It may take years to overcome this inferiority complex, if indeed he manages to do so at all. This is a serious matter and should be considered so by parents, for they have allowed the child to become overweight in the first place.

Let us look at a college girl who is twenty to fifty pounds overweight, a not unusual case. She has all the desires and emotions of the slender young girls of her own age; yet how much is denied her. Beauty, grace, lovely clothes, daintiness, dances, the much longed-for popularity—these are not for her. If she is truly obese and does not reduce, she often runs the chance of losing the most desired goal of womanhood—husband, home and children—and the tragedy is, she knows it.

Mothers are often antagonistic to the young daughter's desire to reduce. How much better it would be if the mother would cooperate by serving the girl an adequate reducing diet. A good reducing diet is far more health-building than the diet mothers often give their daughters.

Even adults from forty to fifty are extremely sensitive about their weight. I have known overweight persons who hated to be seen in public, because others turn to look at them. They often think: "What joys have I in common with others? The only pleasure I have left is to eat, so I'm going to eat." Just

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as a drunkard drinks in order to make himself forget his unhappiness, so does the truly obese person eat. While he is eating, he is happy, for he is not thinking of himself.

You may not have arrived at the stage of obesity where your mind is sick with self-pity. Then see that the bitterness and unhappiness of these people is never yours.

Every new added pound makes it easier for you to gain more. Your exercise automatically decreases correspondingly. Each new pound makes you more conscious of food. Simply because you know you should give up certain foods, you have an inclination to eat more of them. The fat person can eat less food than the slender one and still gain on it, for the fatter he becomes, the less food his body needs. Let the knowledge of these facts be an incentive to you.

People should reduce in order to achieve greater health, but they fail to realize how very important this factor is. I never see an older person who is actually overweight but that the statement, so frequently heard by anyone connected with health work, rings in my ears: "This could have been avoided, had I reduced. Why, oh why, didn't I do it?" Make sure you never voice these words.

For each of the last twenty years heart disease has caused more deaths than any other one cause. Have the majority of these cases been people whose weights were normal? Indeed they were not. Plenty of them were people who considered their craving for sweets

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more important than their health. Life insurance companies tell us that the life expectancy shortens tremendously with obesity. Medical records show that such diseases as diabetes, high blood pressure, and gout claim the lives of obese persons far more than of those whose weights are normal. Let your desire for health and a long life be a stimulus to you now.

Think your situation over carefully. Try to find an incentive strong enough to carry you through a reducing program. If you succeed in finding an incentive, your program will be easy.

Chapter 22

MENTAL ATTITUDES TOWARD REDUCING

Incorrect mental attitudes, like lack of incentives, have prevented thousands of people from reducing.

Many people frown not only upon any attempt to reduce but consider it actually healthful to eat large quantities of food. I once knew a family in which every member was overweight. The parents believed that eating large amounts of food was so important toward building health that the children humorously adopted as a family motto, "Better that the belly burst than that the food should spoil."

Two generations ago fatness was associated with health, and it possibly could have been at that time. Today, however, when so many fattening foods, such as sugar, white breads and cereals, shortenings, oils, and butter substitutes, are so highly refined that they contain almost nothing for the body except calories, this association certainly does not hold true. What a food contains in terms of body requirements is of utmost importance. Yet eating large amounts of food which may offer absolutely nothing toward building the body and must be carried as surplus fat is a distinct detriment to health.

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Others look upon eating as a recreation. They overemphasize the pleasure of eating and think of it more than the importance of such a pleasure warrants. I once heard a physician say that overweight people who talked about food all the time made him want to spread out their twenty-eight feet of fat-covered intestines before them and say, "Look! That is symbolic of you!" Is the pleasure an overweight person gets from eating fattening foods more important than a healthy body? Such people should reevaluate their values.

Change your mental attitude toward eating. Enjoy eating, certainly, but combine both pleasure and health, and do not think of pleasure alone.

Many people do not reduce because they say their faces become haggard. Just as haggard faces often result from illness, so are they the result of inadequate reducing diets. If the diet you use meets the needs of your body, your face will not become haggard, but more attractive.

Other people claim they cannot reduce because they lose weight only in the wrong places. When you are reducing, the fat deposits on your body are used as food. Even if wanted deposits are used first, when they have disappeared, the fat from other parts of your body will then be used. Muscles are never burned as food except after body fat has been used up entirely.

The fat people who are the most difficult to convince that they can reduce as easily as anyone else

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are those who say, "The doctor says it's my glands." At that point they give up and usually use that very remark as an excuse for eating a meal suitable only for a football player or an Arctic explorer. No glandular treatments, regardless of how good or how much they are needed, can possibly cause a loss of weight in a person who overeats.

There is much scientific evidence that glandular abnormalities are often caused by overeating. When your weight was correct, your glands functioned normally. By overeating, you acquired new pounds; your glands, attempting to adjust themselves to a changed body, became abnormal. In hundreds of cases, as reduction has taken place, the glands have again become normal wholly without glandular therapy. Even if abnormal glands have helped to cause a gain in weight, such an individual must live on a reducing diet at the same time he takes glandular treatments.

Dozens of obese people have told me they could not reduce because of glandular abnormalities. Many have proved the falsehood of their own statements by achieving normal weight without glandular therapy. A person with glandular abnormalities can and should reduce, if for no other reason than to give the glands a chance to normalize.

Then there are those who believe that their obesity is due to heredity and that they are powerless to do anything about it. They say, "Mother wore size forty, father weighed two hundred ninety, brother was the fat man in the circus, and grandmother had to have

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an extra wide coffin." Thus over the gravy-smeared fried potatoes, they adjust themselves to the idea of "extra wide coffins."

There are different types of people, just as there are Jersey cows and Hereford cows, race horses and draft horses; but good race horses are not allowed to have their bones exposed, nor are draft horses allowed to get too fat to work efficiently.

Face the fact that you are fat and start doing something sane and sensible about it. You can reduce as easily as anyone else.

Chapter 23

SUCCESSFUL REDUCING

The success of a reducing diet is not measured by the number of pounds lost, but by the length of time those pounds stay off. Hundreds of people have reduced their weight only to gain it back again. If you are willing to do that, don't begin.

In a good reducing program, you consider from the very first day how you are going to remain slender after you have once reached your goal. There is only one way to reduce if you are not to gain again, and that is to change your food habits. You must learn to enjoy the foods which you can eat and stay slender.

There are non-fattening butter substitutes on the market. Saccharine might be used instead of sugar. You might eat crackers, melba toast, or rye crisp instead of bread. If you include these articles in your diet now, you will go back to using butter, sugar, and bread as soon as you reduce, and then you will gain.

When we were youngsters, each of us thought our mother was the best cook in the world. Obviously, each mother could not have been the one best cook. At that time, however, we had eaten our mother's

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cooking more frequently than any other; hence, we had come to enjoy it most.

We learn to like any food by eating it over and over.

If any food on your reducing diet seems distasteful at first, take a small bite of it every time you can; such a small bite that it cannot possibly taste very bad. By the fourth or fifth trial, perhaps sooner, it will taste good.

The reverse applies to your liking of foods which will make you gain. The more often you break your diet and taste them, the longer it will take you to come to dislike them. On the other hand, if you give them up entirely for a few months, you will find that you care little for these forbidden foods.

Food habits can be changed, and much more quickly and easily than you think. Ask any person who has tried to reduce for any length of time whether he prefers coffee black or with cream and sugar, and he will say, black.

I recall a patient who declared that she would not drink milk; it made her sick, she hated the taste of it, and so on. In a week's time she said rather beligerently, "Do you know what I get hungry for now? That despised milk!" A famous movie actor said to me once, "If you say vegetables to me another time, I'll shoot you!" A few months later a considerable loss of weight necessitated a change of diet. This time he said, "Alter the diet all you like, but don't take vegetables away from me."

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Food habits must be changed if you are to remain slender after you have reduced.

It is in this respect that most of the popularly known reducing diets have failed so appallingly. The lamb-chop-and-pineapple, spinach-and-egg, milk-and-banana, orange-juice-and-buttermilk, or even the much superior business of counting calories, has never changed food habits.

Have you known anyone to go on the eighteen-day Hollywood diet, who did not gain all the lost weight back again? I once observed a girl on the last lap of such a diet. On the morning of the nineteenth day her breakfast consisted of bananas and cream, country sausages, buckwheat hotcakes, syrup, butter, and coffee with cream and sugar. "Just think of it" she exclaimed between bites of hotcake. "Fifteen pounds!"

Many people are unwilling to change their food habits. Despite their efforts at easy methods of reducing, they usually remain fat. A woman weighing 265 pounds was once referred to me by her physician for a reducing diet. I explained at considerable length what she must do. Then she shrugged her fat shoulders and said, "I didn't come here to find out what to eat. I can eat all right."

There was little doubt about that. "Then why did you come?" I asked.

"All I wanted were some pills to make me thin," she replied.

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Even if "pills" could be found which would not cause a greater loss of health than weight, their success would be limited, for they do not change food habits. If you could reduce by any such therapy, after you had lost all you wished, you would have the choice of doing one of three things: continue the "pills" on to the grave; gain again; or change your food habits.

There is another definite drawback to any therapeutic weight reduction. The patient invariably says to himself, "I am taking —— which will make me thin. I can eat a little more." In his eating he emphasizes the "more" rather than the "little."

There are numerous methods of reducing which seem to avoid the trouble of changing your food habits. Many of these are built on the principle of ridding the body of part of its water supply. About two-thirds of the weight of the body is water. Water is heavier, per volume, than fat. For example, cream rises to the top of milk. Perhaps you have taken a steam bath, and water (perspiration) has been lost through the pores of the skin. Possibly you have taken a dose of salts or some other cathartic, where large amounts of water have been drawn into the intestines and have thus been eliminated. It may be that you have gone without common table salt for a week or two; this causes water to be eliminated from your body. After any of these forms of dehydration—for that is all it is—you step on the scales and find that you have lost weight. However, you have lost

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pounds of water, and not of fat. When you weigh yourself again after taking liquid, you will realize that only time, which could have been spent on a good reducing diet, has been lost.

Thousands of people allow simple food dislikes to stand between them and sound teeth, steady nerves, good blood, freedom from constipation, and any one of a dozen minor illnesses. All overweight could be laid to that one cause—simple food dislikes. If it be a choice between slenderness and good health on the one hand, or overweight and certain foods on the other, which is the more important to you?

A person may succeed in reducing one hundred pounds, two hundred pounds if that were possible, but if he has not changed his food habits, that is, if he has not learned to enjoy the foods on a reducing diet better than the foods given on a gaining diet, his reducing has not been successful. He will probably gain all his weight back again, and with a few more pounds thrown in for good measure.

If you are the person who refuses to change your food habits, the problem of reducing will follow you to the grave. Why not solve it, once and for all?

Above all else, be willing to change your food habits.

Chapter 24

UNDERSTANDING THE SCALES

One of the most frequent reasons why people become discouraged and give up a reducing program is that they do not understand the scales. If your reducing program is to be easy for you, do not get weighed oftener than once a week; use the same scales at the same time of day each week.

A pair of scales is a very poor index to the loss of fat cells. For example, during the preliminary diet you may eat little salt; this lack of salt may cause as much as four pounds of water to be lost from your body. You will lose, during this time, about two pounds of fat which, together with water, makes a total loss of six pounds. But only one-third of that loss is fat.

The next week's weighing will probably show that you have gained about two pounds, even though you have probably lost two pounds of fat. This is because the body has gained back the four pounds of water it lost. Or the scales may stay exactly the same, which means that the water gain is equal to your fat loss.

If you eat such foods as sauer kraut or salted herring, which are not fattening but salty, you are likely

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to show a gain. This gain, again, is only water, not fat.

It has been found that during rigid reducing diets, water is frequently stored in the body for a short time. When fat is burned, carbon dioxide and water are formed. The carbon dioxide is carried off in the exhaled air, but the water is often retained. Water is heavier per volume than fat. In this case, you will notice that your measurements become less, but the scales will probably show that you have gained.

Recently a woman to whom I had given a diet reduced from 153 to 112 pounds in a short time. For two full weeks her weight stayed at 133, despite the fact that she was carefully observing a strict reducing diet. Of course she became discouraged. I recommended a liberal reducing diet for a week in the way of a rest from the restricted diet she had chosen for herself. During this one week, while she was eating more food than before, her weight dropped from 133 to 125. She had been burning fat rapidly; water had been stored temporarily in her body, for it had formed too quickly for the body to carry it away. Water formed in this way is always eliminated from the body, and then the scales show the long-waited-for reward.

Ignorance of this fact causes many people to believe that their glands are abnormal and that they cannot reduce by dieting. They tell you, "I stayed on a strict reducing diet for an entire week, and I gained

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on it." They are telling the truth, but they did not know how to interpret the scales.

However, for the one time when your weight stays the same because of the retention of water in your body, there will probably be fifty times when you are not actually holding to your diet, and the gain will mean a gain of fat rather than water. If you reach a stage where the scales refuse to go any lower, it is best for you to go back on the preliminary diet for three or four days. And throughout your reducing, hold to Shakespeare's excellent advice, "This above all, to thine own self be true." After all, it is only yourself you are fooling if you break the rules of the diet. It is you alone who will soon become discouraged and decide to remain overweight.

On the preliminary diet, you will lose about one-half pound daily; this loss can be increased or decreased, depending on the amount of exercise you take. Likewise, on the more generous diet you can lose slightly more or less than one-fourth pound daily, again depending on your exercise. Regardless of what the scales tell you, fat cells disappear as long as you stay on the diet.

It is not unusual for a person to vary as much as six to seven pounds in the course of a day. Learn to ignore the temporary fluctuations of gains and losses which the scales will show you.

Chapter 25

A PLEA FOR SLENDERNESS

The greatest mistake you can possibly make is to stop reducing before you have reached your ideal weight. Above ideal weight it is a continuous fight to keep from gaining again.

In order to show why this is true, let us analyze an imaginary case of a young man and his wife. The husband, let us say, weighs 160 pounds, which is his ideal weight. His wife weighs 138, although she should weigh 120 pounds. She can "get by" provided she never allows herself to gain; therefore she does not bother to reduce.

The husband eats large amounts of cream, butter, and a variety of cheeses; when such foods as yams, sweet potatoes, fried liver, yellow peach cobbler, and apricot pie are served, he eats any amount of them he desires. She eats very little of these foods. True, she takes halibut-liver-oil capsules, as does he, but those do not compensate for all the foods rich in vitamin A which she consistently denies herself. It is not surprising that he is more radiantly healthy than she, and that his resistance to disease is higher than hers.

He eats whole-grain cereals and bread and quantities of wheat germ in the form of hot cakes, waffles,

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muffins, and cookies. She knows she would gain if she eats these foods. She does, however, take six yeast tablets daily. Still, his vitamin-B intake is many times higher than hers. We would again expect his health to be better than hers, his digestion and elimination superior to hers, and his nerves more steady.

Both are fond of orange juice. She drinks one glass of orange juice for breakfast, while he drinks two. He frequently has another glass of orange juice later in the day. She is afraid to drink more. So it is that his vitamin-C intake is many times greater than hers, and once more we would imagine his health to be superior to hers.

We could carry such a comparison through all the requirements of the body. In every respect, his diet is better than hers.

Why can he eat more food than she without gaining? The difference lies in just one thing, exercise. Unconscious exercise. When he walks, there is a spring in his step. He moves rapidly. She walks slowly and without buoyancy. His posture is good; she carries herself somewhat indifferently. He runs up a flight of steps; she "climbs" them. He breathes deeply; she shallowly. She often lies down in the afternoon and sometimes goes to sleep; he never does. He therefore uses up much more food than she.

Besides the "unconscious" exercise, which is usually overlooked, he enjoys other types of exercise. He likes nothing better than a good hike, a long swim, and a fast game of tennis. His muscles are therefore hard

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and firm, his circulation is good, and he has great endurance. His diet has given him great vitality.

Because her diet is inferior to his and because she must carry almost twenty extra pounds every time she moves, she finds less pleasure in exercise than does he. She often lies on the beach much of the time he swims; she sits on a rock half way up the mountain while he climbs to the top; she plays a slow game of tennis, and only a few sets at a time. Her muscles are much softer than his, and she lacks endurance when the test is actually hard.

With all of these things in his favor, why should he not be healthier than she? He is, many times more healthy, and he will stay healthier and younger longer than she. What is more, he gets more joy out of life than she, but she has no way of knowing this. If she did, she would reduce quickly to her ideal weight.

This, of course, is not a typical case, for people rarely keep to a routine diet nearly as ideal as I have imagined either husband or wife taking here. However, the example is typical in this respect; there are thousands of people in this country like the wife in our example. Day after day they deny themselves certain good foods because they do not want to be hampered with pounds of fat. They are not actually trying to reduce; they are merely trying to maintain their present weight. Are they hurting their health? One cannot exactly say that they are, for they are indeed wise not to allow themselves to gain more. They are, however, denying themselves optimum health.

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Let us now suppose you are the wife in our example. You must fight constantly to keep from gaining. If you will reduce to your ideal weight, you will increase your conscious and unconscious exercise automatically. This exercise, aside from increasing your muscle tone and strength, will use up large quantities of food. Now you can eat a very superior diet, which can bring you optimum health.

If you stop reducing before you reach your ideal weight, you stay in a vicious circle: the fatter you become, the less exercise you take; the less exercise you take, the fatter you become.

If you reduce to your ideal weight, you are again in a circle, but this circle is not vicious. Like the husband in our example, the better diet you are on, the more vitality you have; the more vitality you have, the more exercise you take; the more exercise you take, the more valuable foods you can eat without fear of gaining. The joy which comes from this circle alone justifies the words, the fun of reducing.

A strict reducing diet can be superior to that eaten by the average person today. A generous reducing diet can be made to build and improve health. A normal diet, which includes all of the foods given on a reducing diet, together with a few foods which offer body requirements but must be omitted from a reducing diet, is by far the best diet of all. This normal diet you can eat, if you will only reduce to your ideal weight. You have learned to enjoy many good foods on this diet which you did not enjoy before, for you have changed

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your food habits. This diet, which can be made rich indeed in the needs of the body, can bring you optimum health.

Let us suppose that you have wisely reduced to your ideal weight. You did not realize it was possible to get such satisfaction from sheer physical well-being. You feel like an utterly normal person again. It is fun to look into the mirror, to go to the dressmaker's, to renew old acquaintances. It is fun just to walk or stand or breathe. What you thought was the impossible has happened. You are slender and healthy and happy, and you will never again let yourself gain back those heavy pounds.

Height-Weight Standards

Most of the height-weight tables used today were compiled some twenty years ago. They are merely averages of all types of people. The figures given in such tables may be more or less reliable as a standard for the weights of children, but they certainly are not for adults. The average person at that time allowed himself to gain as his exercise decreased with age. The adult who uses these tables is doing nothing more than to compare himself to the average weight of thousands of people, the majority of whom were more or less obese.

Because these tables have proved unsatisfactory for adults, in my own work I use this simple standard: 100 pounds for an adult of five feet, either men or women; for women 5 additional pounds for each inch

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over 5 feet; for men, 7 additional pounds for each inch over 5 feet. This has worked out most satisfactorily.

For example, a woman who is 5 feet 5 inches tall should weigh, according to this standard, 125 pounds. A man who is 5 feet 10 inches should weigh about 170 pounds.

From this standard is allowed a 20-pound range for personal preference and individual bone build. If a woman who is 5 feet 4 inches tall has small bones or wishes to be particularly slender, she may choose 110 pounds for her ideal weight rather than 120 pounds. If a man who is 5 feet 11 inches tall has large bones and feels better when he is heavier, he may choose 187 for his ideal weight.

This standard, of course, is not ironclad in any respect. However, it is simpler and more satisfactory than the accepted height-weight charts, which have not been brought up to date.

Chapter 26

WHICH TYPE ARE YOU?

Slenderness is undoubtedly the ideal state for an adult. A person is not considered underweight until he is 10 percent below the average weight for his height and age. As a rule, the person whose weight is below this standard has dropped from optimum health. He is frequently nervous, has low resistance to disease, suffers from cold when others are comfortable, and easily becomes both mentally and physically fatigued.

The healthy body must have thin paddings of fat to protect the nerves, to help support the internal organs, to aid in the regulation of body heat, to serve as a fuel reserve for possible emergencies, and to give the body graceful and beautiful lines.

Of the many causes of underweight, some are very serious. For this reason, anyone wishing to gain should first have a thorough examination by a physician. Even when it is known that your problem is purely a nutritional one, there are still many dietary lacks which must be considered separately.

The simplest type of underweight is found in people who eat large amounts of food, but are unconsciously staying on a reducing diet.

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A girl who exemplifies this type of underweight person recently spent the week-end with me. She talked about wanting to gain, just as many over-weight people say they are about to start to reduce. I offered her cream and sugar for her coffee. Refusing both, she stated, "I prefer coffee black." As I prepared the salads, she said, "Don't put mayonnaise on mine. I never eat it." Bread, cooked cereal, and potatoes were refused in much the same manner, while she used butter and cream sparingly. Still, she ate generous amounts of fruits and leafy vegetables, skim milk, tomato juice, and other non-fattening foods. If no thought were given to the caloric value of the foods she ate, one would wonder how she could remain so thin.

It is said that a rut differs from a grave only in depth. Many underweight persons, and others too for that matter, have allowed their food habits to get into a rut. We all learn to like foods by eating them. If any health-giving food is distasteful to you, eat only small amounts of it at first and gradually increase the amount of it as you come to like it. The fact that hundreds of small children have actually learned to enjoy the taste of cod-liver oil might be taken as evidence that one can learn to enjoy the taste of any good food if it is eaten repeatedly.

This type of underweight person can gain easily if he will learn to enjoy a few high-calorie foods. If he really wants to gain, he should be willing to do that.

The second type of underweight person is the habitual undereater. Everyone becomes accustomed to a

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certain pressure in his stomach at the end of a meal. In other words, at a certain point, he has a feeling of fullness. If he increases that pressure by eating more food, he has a feeling of discomfort. These underweight people have become accustomed to a very light pressure in their stomachs, and seem to be filled up at the very beginning of a meal. "I simply can't eat another bite," they say. Though they are sincere, they are not speaking truthfully.

The stomach is nothing more than an elastic pouch which is distended by, or contracts upon, the mass of food which is put into it. It can accommodate a very large amount of food. We might compare the stomach walls of the undereater to a new elastic band. It is difficult to stretch the band at first. However, after the band has been stretched a few times, it becomes increasingly easier to stretch it again. Thus the pressure on the stomach walls can be gradually increased, and no discomfort will follow the eating of a hearty meal after a week or two of meals larger than those you are accustomed to.

There are other underweight people who merely have bad food habits. While they may be fairly healthy, they give little thought to preserving and improving their present health. You watch them eat a large dinner and wonder how they can remain so thin. However, you were not aware that they rushed off to work with only a cup of coffee for breakfast, did not stop working to eat lunch, and were active all day long. Nor are you aware that they depend on this one meal,

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dinner, to carry them through the entire twenty-four hours.

These three groups of underweight people may be relatively healthy. They may have fair appetites, freedom from constipation, excellent digestion, and absorption of food. They may be reasonably calm rather than nervous. On the other hand, these groups may overlap into the group of underweight people who have definitely dropped below average health. If they continue to eat unwisely, sooner or later they will join the group who have lost their health.

A deficiency of vitamin B alone often causes underweight, because it is so definitely associated with the nerves and the functions of the digestive tract. Lack of vitamin B leads to poor appetite, gas pain or air swallowing, constipation, and nervousness. Lack of appetite naturally results in a small food intake. If indigestion or gas pain follows, the food intake is still further decreased. Soda is often taken, which causes the food to be improperly digested and absorbed. The constant use of cathartics will cause anyone to lose weight and to lose health as well, for the vitamins, minerals, proteins, and calories are pushed through the body before they have had time to be digested and absorbed adequately into the blood stream. The underweight person of this type, who already eats so little that he needs every atom of food which he swallows, is likely to suffer from multiple vitamin and mineral deficiencies.

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Frequently, nothing more is needed to cause an increase in weight than a diet high in vitamin B. I recall a young woman who weighed 90 pounds when she came to my office for a gaining diet. Because she showed many symptoms of a vitamin-B deficiency, I told her merely to eat all the wheat germ she could and to stop taking cathartics. Her diet, aside from the lack of vitamin B, was excellent. I did not hear from her until a month later, when she came in weighing 114 pounds.

Likewise, a lack of calcium can cause underweight. Calcium is necessary to proper nerve action, and the person who lacks calcium is likely to use up such large amounts of "nervous energy" that it is almost impossible for him to gain. He wastes or dissipates energy. He walks needlessly fast, moves unnecessarily, such as tapping on the arm of his chair. Such a person often cannot relax. The cause of his nervousness must be removed before he can gain weight. It is largely because milk is such a rich source of calcium, and calcium helps this type of underweight person relax so that he can gain, that milk is popularly thought of as fattening.

Like the person who lacks calcium, almost all underweight people could be said to be wasters of energy. Many eat enough food for the normal person, and some eat fairly adequate diets. However, they cannot gain until they have built up their health to the place where they can relax, where they are energetic but not wasting energy. Buoyant vitality and nervous energy are two very different things indeed.

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Slight improvements in your diet might easily prevent unforeseen illnesses. Moreover, these improvements, continued until they become good habits and carried on through life, can bring you to, and keep you in, optimum health.

Chapter 27

PREPARATION

It is needless to ask an underweight person to overeat in order to gain weight. Even if he manages to gain, he will soon lose weight again because of his unnecessary movements. First his nerves must be made to relax.

You must plan to get your body into the condition to gain and to retain that weight, once it is gained. This may take from two weeks to several months, depending upon your individual case. First, stop taking cathartics, if you are guilty of such practice.

Eat one-half cup or more of wheat germ daily, for it is an excellent source of vitamin B. While it is not fattening in itself, it will do much to help you gain. You may have it as a hot cereal or in hotcakes, waffles, muffins, cookies, spice cake, or nut bread. The more you eat of it, the better.

You must drink a quart of whole milk daily. Vitamin-D milk is to be recommended if you can obtain it. This you can use in soups, custards, ice cream, malted milks, creamed vegetables, and gravies, or you can take plain. It is best, however, for you to cultivate a taste for milk alone as a beverage, for you will be wise to learn to enjoy it enough to drink a quart daily all your life. Eat one or more servings of cheese daily. If you

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are extremely nervous, a few tablets of a calcium-phosphorus salt might be taken daily to advantage. These can be bought at drugstores, and should be taken in addition to the milk and cheese.

You must have some form of fish-liver oil. Two or three tablespoonfuls of cod-liver oil is to be preferred because of the extra calories in it, but do not take it unless you enjoy its taste. You may buy cod-liver-oil concentrate or halibut-liver oil in tasteless capsules at drugstores. Take two or three of them daily. Do not buy a product which contains Viosterol unless advised to do so by your physician or dentist.

In addition to these foods, you must drink two cups (sixteen ounces) of orange or grapefruit juice daily. Have one egg daily if you tolerate it well.

The major part of your diet should be largely fruits, vegetables, butter, cream, mayonnaise, nuts, and a little meat. Other than the essentials listed, do not force yourself to eat. In order not to satisfy your appetite readily, avoid sweets and concentrated starchy foods. Do not expect to gain at this time.

When you have eaten these foods until your digestion and elimination are normal, and your nerves are relaxed, then go on to the gaining diet but not before.

Chapter 28

GAINING DIET

Almost everyone knows the foods which are most often recommended to the thin person: starches, fats, and sweets. Most underweight people have tried eating large amounts of these foods with all too little success. From the nutritional point of view, little can be said for this conventionally accepted gaining diet. Starchy foods, such as white rice, macaroni, spaghetti, white bread, refined cereals, almost all sweets, and all fats except butter, cream, cheese, and fish-liver oils, are very low in minerals and vitamins essential to optimum health.

It is not at all impossible that subtle vitamin and mineral deficiencies could be actually caused by such a gaining diet. Paul de Kruif writes in his book *The Hunger Fighters*, "There is a kind of hunger other than the hunger of the face gaunt for the lack of food, of the lean belly hurting for want of something to fill it. There is a hidden hunger that lets folks starve to death while they are eating plenty."

The deficiencies of the accepted gaining diet have caused me to adopt an entirely different type of diet for the underweight person. This diet has long been used in a modified form by physicians in the treatment of

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diabetes, though not for the purpose of putting on weight. People on this diet gain very easily, are invariably hungry, and seem to enjoy this choice of foods. The foods on this diet exert a light rather than a heavy pressure in the stomach at the end of the meal. The diet is planned that the foods can leave the stomach rapidly and allow an early return of appetite.

The foods which have been recommended in the preparation diet must be continued. Plan to eat them throughout life.

Fats have a much higher caloric content than any other class of foods; at the same time they are small in bulk. One tablespoonful of butter or oil is as fattening as a large potato, and takes up possibly one-tenth as much space in the stomach as does the potato. For this reason, fats are given a prominent place in the gaining menus, and are depended upon to put on the greater part of the weight gained.

In a gaining diet, fats must be increased gradually. A sudden large increase in fat is likely to be very distasteful and may even cause a digestive upset.

You may eat just as many fruits as you can. Dried fruits, averaging about 75 percent sugar, are excellent eaten uncooked for midmeals and at the end of your meals, because their bulk is small. Avocados, bananas, fresh figs, apricots, apples, cherries, grapes, pears, plums, and fresh prunes are more fattening because they contain more sugar than grapefruit, berries, melons, peaches, oranges, and fresh pineapple, although the latter certainly need not be excluded. Raw fruits are

GAINING DIET

somewhat superior to cooked, because vitamins A and C are hurt by cooking. Canned fruits or vegetables are excellent and are to be preferred to home-cooked ones, because the oxygen which harms the vitamins is excluded during the cooking process. Use colored fruits, as apricots, yellow peaches, cantaloupe, and plums, more than colorless ones, because of their vitamin-A content.

Fruits in this diet must serve another function, that of carriers of cream and mayonnaise. The breakfast fruit and those served as desserts should be eaten with cream just as often as the family budget allows. Orange juice mixed with equal parts of cream makes a palatable drink. Salads must be eaten with large amounts of mayonnaise, and because of the higher sugar content, should be made of fruits more often than of vegetables.

Any kind of vegetables may be eaten, but those having the brightest color, as green peppers, spinach, carrots, escarol, and broccoli, should be used most frequently. Starchy vegetables and grains, such as corn, dry beans, rice, macaroni, and potatoes, should be largely avoided because of their high satiety value. Eat these occasionally if you desire them, of course, but do not depend on them to put weight on you.

Just as fruits must be carriers of cream and mayonnaise, so must vegetables be carriers of butter and mayonnaise. The butter should be added just before the vegetables are eaten. In this way the amount may be observed, its vitamin-A content is not hurt

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by cooking, and the overweight members of the family will not be made to suffer while you gain. At first, add one teaspoonful of butter to each serving of vegetables, doubling and tripling that amount later. Care should be taken that the butter not be left on the plate, uneaten. Since the time is past when we believe fried foods are injurious to the healthy person, many vegetables, such as summer squash, carrots, parsnips, beets, and eggplant can be fried to advantage for the underweight person.

You may have all the cheese you can eat, the more the better. Almost all kinds of cheese, except cottage cheese, have a high fat content. Add cheese to cooked vegetables, salads, soups, scrambled eggs, and omelets; eat cheese souffles, cheese sandwiches fried in butter, and a piece of cheese for a midmeal or a dessert.

Nuts are also rich in fat and can be given a prominent place in your diet. Add them to salads, sandwiches, desserts, wheat-germ muffins, and cookies. Eat them after lunch and dinner. Eat an entire bag of nuts for a midmeal. Always have an attractive dish of nuts and fruits on the table where it can tempt you to eat more.

Meats have the bad faculty of "sticking to the ribs." In other words, they are satisfying to the appetite. For this reason eat only one small serving of meat daily. Liver, kidneys, and oysters are outstandingly good foods, and should be eaten frequently. All red meats contain more iron than do pork, sausages, and fish canned in oil, although the latter are richer in fat.

GAINING DIET

Meats can be fried and served with gravies, and butter can be generously added to steaks.

Soups should be limited to the richer, thicker varieties. Meat broths somewhat stimulate the appetite, but since they are little more than water, they should not be emphasized.

Wheat germ should be used in the place of other cereals during the gaining program. Use whole-grain breads, preferably without the germ removed. Until you have gained all you desire, eat no more than one slice of bread at each meal, for bread readily satisfies the appetite. Use bread chiefly as a carrier of butter.

You may have one or two eggs daily. They too must carry fat. They may be scrambled, fried, in omelet, or soft boiled with much butter added to them.

Although sweets may take little room in your stomach, they destroy the appetite more than any other food. Besides this, sugar adds absolutely nothing in the way of body requirements aside from calories. You will be generously supplied with sugar by eating fruits. Therefore, eliminate sweets to a large extent if you want to reach the above-the-average degree of health.

Two or three midmeals should be added to your diet as soon as your appetite is normal. By a mid-meal, I mean a definite meal, taken at a definite time each day. It should be eaten as soon as possible after the previous meal, hence as long as possible before the next regular meal, in order that your appetite may be restored. These midmeals should be taken about

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nine o'clock in the morning, three in the afternoon, and before retiring. They must be small in bulk but high in the food factors your body needs. A glass of orange juice, a banana, fresh fruit, cheese, and nuts make excellent midmeals. A hot drink made of milk is to be preferred at night. Set regular times for these small meals, and train yourself to eat them habitually.

Let us summarize the gaining diet as to its daily requirements:

1. One-half cup or more of wheat germ
2. One quart of whole milk; one or more servings of cheese
3. Some form of fish-liver oil
4. Two cups of orange or grapefruit juice
5. One or more eggs
6. Three or more colored fruits with cream
7. Three or more colored vegetables with butter
8. One salad, usually of fruit
9. One small serving of meat, if desired
10. As much cream, butter, mayonnaise, and nuts as can be eaten

Chapter 29

THE REWARD OF GAINING

The person who starts enthusiastically on a gaining program, eats far more on the first day than he is accustomed to, and increases other foods proportionately, usually stays on the diet about as long as the fat person who decides to reduce by eating nothing, but he usually ends up even more disastrously.

Plan to gain slowly. First, put your body in condition to gain. Go bravely about the business of breaking your habits of irregular eating or of undereating. Gradually give up sweets and part of the starches in your usual diet, and replace them by more health-giving foods. Increase your fats gradually but consistently. Eat your midmeals regularly. Drink a warm milk beverage before retiring, and success will soon be yours.

If you take each step, unhurried, as you come to it, no part of the gaining program will be hard for you. To hurry through a gaining program is disastrous. Pounds put on rapidly usually come off just as rapidly. This is because it takes time to build up the health, and a good gaining program is a health-building program. The actual gain in weight is insignificant.

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The improvement in health is the real goal, and it is of utmost importance.

Mild exercise in the fresh air and sunshine is excellent and will do much to increase your appetite. As your nerves relax, increase your hours of sleep. If possible, have a nap in the afternoon. Take a daily sunbath of at least one-half hour whenever you can do so. Try in every way you can to avoid a needless waste of energy.

Do not be content with yourself until you have reached your ideal weight. Unless you try to gain too rapidly, it is just as easy to stay on the gaining diet as it is to go off it.

I recall a girl of fourteen who was once brought to me for diet advice. She was a very tall child, and while she should have weighed 135 pounds, she actually weighed 87 pounds. She had been ill a great deal with numerous intestinal disorders, had made many unsuccessful attempts to gain, and was, I was informed by a number of people, just one of those "hopeless cases." By eating an adequate diet, rich in vitamin B and calcium, and later eating large amounts of foods rich in fats, she gained to 121 pounds, still 14 pounds below her optimum weight. It was then time for her to go to school, where she would need more food rather than less because of the increased energy output it would demand of her. However, her mother thought she was well enough, for she was heavier than she had ever been before, and was healthier than she had been for many years.

THE REWARD OF GAINING

The gaining program ceased, and the loss of weight soon followed. After three months she had to drop school again because of recurred illnesses.

Here was a child, who had been ill almost all of her life, with good health in view, and yet she was allowed to return to her bad food habits. How pitifully typical is such a case!

Too many people are content to feel only fairly well. Too many minor illnesses are accepted as a matter of course. Too many deaths occur long years before they should. The right to health is the right of every human being. All too often each person has it in his grasp, only to throw it away again.

Do not give up until you have reached your goal, a goal not only of a number of pounds gained and kept, but a goal of optimum health. Then grace and beauty of body will replace angular lines. Buoyant vigor will crowd out needless nervous energy. An even temper will be substituted for irritability. Healthy tiredness will come instead of exhaustion. Relaxation will take the place of strained tension. Sound sleep will replace restless tossings. Sheer physical well-being will convince you that you have not known the true meaning of health. These are the rewards of a health-giving gaining program, and these rewards are yours for the effort.

SUGGESTED MENUS

Frequently a group of suggested menus is all a person needs to gain or to reduce. However, since it is the mother's duty to plan menus long after the gaining or reducing program is over and forgotten, the theory behind the planning of menus is of paramount importance to her. In the final analysis it is she who is largely responsible for the amount of money which must go to the dentist and to the physician during the year.

If any member of a family deviates from his ideal weight and seeks correction through diet, everyone immediately assumes that special cooking must be done for him. This is entirely wrong. Food should always be prepared for the overweight member of the family; to the same food the others can make additions such as butter, cream, mayonnaise, cheese, nuts, cereals, breads, and occasionally sweets, which are denied to him.

For this reason I have revised the menus offered to the reducing patient, altering them only slightly, though sufficiently, to be used by anyone who wishes to gain. No special dishes need be prepared for either. Family groups among my patients have frequently applied this plan in their homes, and it has worked out most successfully. I have added, of course, more

SUGGESTED MENUS

calories, but less bulk, for the underweight person. It is, I feel, more important to reduce rapidly than to gain rapidly; therefore the reducing diet is very low in calories, but the gaining diet is not nearly so high in calories as it might be made.

The person of normal weight may use either group of menus given here, adding or subtracting as many fattening foods as his weight demands.

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
orange juice, 4 ounces
cantaloupe, half small
crisp drained broiled bacon, 2 slices
wheat-germ muffin, small
clear coffee or tea

10:30

skim milk, 8 ounces

Luncheon

scrambled egg with green peppers, 5 tablespoonfuls
okra, 4 tablespoonfuls
diced beets, 3 tablespoonfuls
stuffed tomato salad with 1 tablespoonful of boiled dressing;
 ingredients: celery, cucumber, string beans, lettuce
skim milk, 8 ounces

4:30

tomato juice with lemon, 8 ounces

Dinner

fat-free chicken broth, 8 ounces
white meat of chicken, 1 breast
new peas, 1 tablespoonful
Brussels sprouts, 6 tablespoonfuls
watercress and escarol salad with lemon-juice dressing
strawberries served unstemmed, half cup

9:30

skim milk, 8 ounces

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
cantaloupe, quarter small
bacon, 3 slices
wheat-germ muffins, 3 medium, with 2 squares of butter
coffee with cream and sugar

9:30

banana, large

Luncheon

scrambled egg with green pepper, 3 tablespoonfuls, with 1 square of butter
okra, 2 tablespoonfuls, 1 square of butter
diced beets, 2 tablespoonfuls, with 1 square of butter
stuffed tomato salad, 2 tablespoonfuls of mayonnaise
whole-wheat bread, 1 slice, with 1 square of butter
chilled cocoamalt, 8 ounces
fruit jello with cream

3:00

orange juice, 8 ounces

Dinner

chicken broth, 4 ounces, with 2 tablespoonfuls of chicken fat
chicken, 1 thigh
new peas, 3 tablespoonfuls, with 1 square of butter
Brussels sprouts, 2 tablespoonfuls, with $\frac{1}{2}$ square of butter
watercress and escarol salad, small, with 2 tablespoonfuls of French dressing
whole milk, 8 ounces
whole-wheat bread, 1 slice, with 1 square of butter
strawberries with heavy cream

9:30

hot chocolate, 8 ounces

SUGGESTED MENUS

Reducing Diet

Breakfast

fish-liver-oil capsules
tomato juice with clove, 8 ounces
grapefruit, half large
wheat germ, 2 tablespoonfuls, with 6 ounces of skim milk
clear coffee or tea

10:30

orange, small

Luncheon

stuffed eggplant, 6 tablespoonfuls; ingredients: par-boiled egg-plant stuffed with tomatoes, green peppers, onions and covered with jack cheese
cabbage and pineapple salad, three-fourths cup, with boiled dressing
skim milk, 8 ounces
Persian melon, small slice

4:30

skim milk, 8 ounces

Dinner

tomato aspic, half cup
broiled liver, 2 large slices
smothered onions, 2 tablespoonfuls
mashed Danish squash with parsley, 3 tablespoonfuls
artichoke, large, with 2 tablespoonfuls of boiled dressing
skim milk, 8 ounces

9:30

orange, small

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
grapefruit, half small, with 2 tablespoonfuls of sugar
banana, small, with half cup of cream
wheat-germ cooked cereal with half cup of cream
whole-wheat bread toast, 1 slice, with 1 square of butter
coffee with cream and sugar

9:30

salted almonds, 3 tablespoonfuls

Luncheon

stuffed eggplant, 3 tablespoonfuls, with 1 square of butter
cabbage and pineapple salad with 2 tablespoonfuls of mayonnaise
wheat-germ nutbread, 2 slices, with 1 square of butter
whole milk, 8 ounces
canned apricots with half-cup of cream

3:00

orange juice, 8 ounces

Dinner

broiled liver, 1 slice, with 1 square of butter
smothered onions, 1 tablespoonful, with half square of butter
mashed Danish squash with parsley, 3 tablespoonfuls, with 1 square of butter
artichoke, small, with 2 tablespoonfuls of mayonnaise
wheat-germ nutbread, 2 slices, with 1 square of butter
apple pie with full-cream cheese

9:30

malted milk, 8 ounces

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
grapefruit juice, 4 ounces
casaba melon, medium serving
egg, hard boiled
wheat germ, 2 tablespoonfuls, with half cup of milk
clear coffee or tea

10:30

orange, medium

Luncheon

broiled frankfurters, 2
sauer kraut, 4 tablespoonfuls
carrots, 4 small
string beans, 4 tablespoonfuls
head-lettuce with cottage cheese
skim milk, 8 ounces
ice tea

4:30

skim milk, 8 ounces

Dinner

baked trout, 3 inches square
Spanish sauce, 3 tablespoonfuls
spinach, 4 tablespoonfuls
asparagus, 10 stalks
green pepper, celery, and escarol salad, 6 tablespoonfuls
skim milk, 8 ounces

9:30

tomato juice, 8 ounces

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
grapefruit juice, 8 ounces
casaba melon, small slice
grapenuts, 3 tablespoonfuls, with 2 tablespoonfuls of wheat
germ and 6 ounces of cream
whole-wheat bread toast, 1 slice, with 1 square of butter
coffee with cream and sugar

9:30

fresh figs, 4

Luncheon

broiled frankfurters, wrapped in thinly sliced cheese and 2 slices
of bacon
carrots, 2, with half square of butter
string beans, 2 tablespoonfuls, with 1 square of butter
banana, cottage cheese, and lettuce salad with 2 tablespoonfuls
of mayonnaise
whole-grain bread, 1 slice, with 1 square of butter
whole milk, 8 ounces
wheat-germ spice cake with 3 tablespoonfuls of whipped cream

3:00

orange juice, 8 ounces

Dinner

baked trout, 2 inches square
Spanish sauce, 2 tablespoonfuls, with half square of butter
asparagus, 5 stalks, with 1 square of butter melted
green pepper, celery, and escarol salad, 3 tablespoonfuls, with
2 tablespoonfuls of French dressing
whole-wheat bread, 1 slice, with 1 square of butter
chopped fresh dates with cream

9:30

cocoa, 8 ounces

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
tomato juice cocktail, 8 ounces; add Worcestershire sauce, horse-radish, and mustard
scrambled eggs with green peppers, 2 tablespoonfuls
clear coffee or tea

10:30

skim milk, 8 ounces

Luncheon

baked tomato, small, covered with jack cheese
cauliflower, 4 tablespoonfuls
summer squash, 5 tablespoonfuls
baked rutabaga, 1 small
wheat-germ muffin, medium size
skim milk, 8 ounces
fresh pineapple, 2 slices

4:30

raw tomatoes with salt, 2 medium

Dinner

broiled meat balls, 2, with mushrooms
Brussels sprouts, 3 heaping tablespoonfuls
steamed eggplant cooked with tomatoes, 5 tablespoonfuls
beet and cucumber salad, 6 tablespoonfuls, with boiled dressing
skim milk, 8 ounces

9:30

skim milk, 8 ounces

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
canned figs, 4, with half cup of cream
scrambled eggs with green peppers, with 1 square of butter
whole-wheat bread toast, 1 slice, with 1 square of butter
coffee with cream and sugar

9:30

uncooked, dry apricots, 6

Luncheon

baked tomato, 1 small; American cheese, 2 thick slices
cauliflower, 2 tablespoonfuls, with half square of butter
summer squash, 2 tablespoonfuls, with 1 square of butter
baked rutabaga, small, with half square of butter
wheat-germ muffins, 3, with 2 squares of butter
whole milk, 8 ounces
fresh pineapple, 2 slices, with 2 teaspoonsfuls of sugar

3:00

orange juice, 8 ounces

Dinner

broiled meat ball, 1, with 2 tablespoonfuls of mushrooms
Brussels sprouts, 2 tablespoonfuls, with 1 square of butter
steamed eggplant with tomato sauce and 1 square of butter
beet and cucumber salad, 3 tablespoonfuls, with 1 tablespoonful
of mayonnaise
wheat-germ muffins, 2, with 1 square of butter
whole milk, 8 ounces
ice cream, 1 serving; almond macaroons, 4

9:30

hot chocolate

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
sliced grapefruit, large
wheat germ, 2 tablespoonfuls, with 8 ounces of skim milk
poached egg
clear coffee or tea

10:30

tomato juice, 8 ounces

Luncheon

baked spinach with egg, 6 tablespoonfuls; run spinach through food chopper, season with salt, pepper, chopped onion; bake in individual ramekins, cover with egg and garnish with pimiento
diced beets, 2 tablespoonfuls
Italian squash, 4 tablespoonfuls
head-lettuce salad with tartar sauce made of boiled dressing
skim milk, 8 ounces
raspberries, half cup

4:30

orange, medium

Dinner

baked white fish, medium serving
string beans, 3 tablespoonfuls
broccoli, 4 tablespoonfuls
vegetable salad molded in gelatine, 1 serving
skim milk, 8 ounces
watermelon, small serving

9:30

skim milk, 8 ounces

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
grapefruit juice, 8 ounces
fresh strawberries, 1 cup, with half cup of cream
oatmeal with wheat germ added, half cup, with half cup of cream
poached egg with half square of butter
whole-wheat toast, 1 slice, with 1 square of butter
coffee with cream and sugar

9:30

salted peanuts

Luncheon

baked spinach with cheese
Italian squash with 1 square of butter
lettuce salad with nuts, banana, dates, and 2 tablespoonfuls of mayonnaise
whole-wheat roll, 1 with 1 square of butter
whole milk, 8 ounces
fresh raspberries with cup of cream

3:00

orange juice, 8 ounces

Dinner

baked white fish, medium serving, with 1 square of butter
string beans, 2 tablespoonfuls, with half square of butter
broccoli, 2 tablespoonfuls, with half square of butter
vegetable salad molded in gelatine, 1 serving, with 1 tablespoonful of mayonnaise
whole-wheat bread, 1 slice, with 1 square of butter
whole milk, 8 ounces
ripe figs with half cup of cream

9:30

warm whole milk, 8 ounces

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
tomato juice with lemon, 8 ounces
cantaloupe, half medium
Spanish omelet, 5 tablespoonfuls
wheat-germ hotcake, 1; make entirely of wheat germ, and bake
on a dry griddle
clear coffee or tea

10:30

skim milk, 8 ounces

Luncheon

liverwurst, 5 thin slices
cooked celery, 6 tablespoonfuls
shredded carrot, apple, and lettuce salad, 8 tablespoonfuls, with
2 tablespoonfuls of boiled dressing
skim milk, 8 ounces

4:30

orange, medium

Dinner

jellied consomme, 1 cup
broiled chicken, half small
beet greens, 5 tablespoonfuls
baked carrots, 4 small
combination vegetable salad, 6 tablespoonfuls, with lemon juice
dressing; ingredients: celery, cucumbers, radishes, green onions,
lettuce, watercress; rub salad bowl with clove of garlic
skim milk, 8 ounces
grapefruit, half medium

9:30

skim milk, 8 ounces

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
fresh peaches with cup of cream
Spanish omelet, 3 tablespoonfuls, with half square of butter
wheat-germ hotcakes, 4 medium, with 2 squares of butter and
3 tablespoonfuls of honey
coffee with cream and sugar

9:30

banana, large

Luncheon

cooked celery, 2 tablespoonfuls, with half square of butter
carrot, apple, and lettuce salad with 2 tablespoonfuls of cream
cheese and 2 tablespoonfuls of mayonnaise
rye bread, 1 slice, with 1 square of butter
stewed pears with preserved ginger, 3 halves
wheat-germ cookies, 4 small

3:00

orange juice, 8 ounces

Dinner

broiled chicken, one-fourth, with 3 tablespoonfuls of milk gravy
beet greens, 2 tablespoonfuls, with half square of butter
baked carrots, 3 small, with half square of butter
vegetable salad, small serving, with 3 tablespoonfuls of French
dressing
whole-wheat roll with 1 square of butter
almond chocolate pudding with half cup of cream

9:30

hot malted milk, 8 ounces

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
tomato juice, 8 ounces
raspberries, 1 cup
wheat-germ cereal, 2 tablespoonfuls, with half cup of skim milk
clear coffee or tea

10:30

orange, medium

Luncheon

fat-free vegetable soup, 8 ounces
vegetable salad, 2 cups; ingredients: half head of lettuce, watercress, green onions, hard-boiled egg
skim milk, 8 ounces
unstemmed strawberries

4:30

raw tomatoes, 2 large

Dinner

fruit cocktail, half cup, unsweetened
lobster, half large
string beans, 5 tablespoonfuls
broccoli, 5 tablespoonfuls
apricot, lettuce, and cottage cheese salad, small serving, with
1 tablespoonful of boiled dressing
skim milk
canned pineapple, 1 slice, no juice

9:30

skim milk, 8 ounces

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
raspberries, half cup, with half cup of cream
wheat-germ cereal, half cup, with half cup of cream
whole-wheat toast with 1 square of butter
coffee with cream and sugar

9:30

fresh dates, 4, and small banana

Luncheon

vegetable soup with 1 tablespoonful of soup fat, 3 crackers
vegetable salad, same as on reducing diet except that egg is
replaced with half avocado; 2 tablespoonfuls of mayonnaise
whole-wheat bread, with 1 square of butter
whole milk, 8 ounces
fresh strawberries with 1 cup cream and 2 teaspoonfuls of sugar

3:00

orange juice, 8 ounces

Dinner

fruit cocktail, 1 cup
lobster, half, with 3 tablespoonfuls of melted butter
string beans, 2 tablespoonfuls, with half square of butter
broccoli, 2 tablespoonfuls, with half square of butter
apricot, lettuce, and cream-cheese salad with 2 tablespoonfuls
of mayonnaise
canned pineapple, diced, with marshmallows
whole milk, 8 ounces

9:30

warm milk, 8 ounces, with 1 teaspoonful of sugar, sprinkled
with nutmeg

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
tomato juice cocktail, 8 ounces
sliced orange, medium
wheat-germ cereal with half cup of skim milk
poached egg
clear coffee or tea

10:30

heart of celery

Luncheon

consomme, fat-free, 8 ounces
cottage cheese, 3 tablespoonfuls
summer squash, 5 tablespoonfuls
asparagus, 10 stalks, with half head of lettuce and boiled dressing
skim milk, 8 ounces
fresh blackberries, half cup

4:30

skim milk, 8 ounces

Dinner

half grapefruit
roast beef, fat-free, 2 thick slices
cauliflower, 4 tablespoonfuls
baked tomato, 1 large
vegetable salad of artichoke heart, baby beets, onion, lettuce
skim milk, 8 ounces
fresh peach, medium

9:30

orange, medium

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
cooked prunes with lemon peel, 8 medium, with half cup cream
whole-grain cereal with 3 tablespoonfuls of wheat germ and
half cup of cream
poached egg, soft cooked, with 1 square of butter
whole-wheat bread toast, 1 slice, with 1 square of butter
coffee with cream and sugar

9:30

banana, large

Luncheon

Swiss cheese, 4 slices, 2 inches square
summer squash, 2 tablespoonfuls, with half square of butter
asparagus, 5 stalks, with 2 tablespoonfuls of mayonnaise, lettuce
whole-wheat roll, 1, with 1 square of butter
whole milk, 8 ounces
fresh blackberries, half cup, with half cup of cream

3:00

orange juice, 8 ounces

Dinner

roast beef, 1 slice, with 3 tablespoonfuls of milk gravy
baked potato, 1 small, with 1 square of butter
cauliflower, 2 tablespoonfuls, with half square of butter
baked tomato, 1 medium, covered with American cheese
vegetable salad with 3 tablespoonfuls of French dressing
whole-wheat bread, 1 slice, with 1 square of butter
whole milk, 8 ounces
fresh peach shortcake with whipped cream, as much as desired

9:30

hot cocoamalt, 8 ounces

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
tomato juice, 8 ounces, with lemon
Persian melon, small serving
scrambled eggs with ground spinach, 3 tablespoonfuls
wheat-germ waffle, half of one
clear coffee or tea

10:30

skim milk, 8 ounces

Luncheon

clam chowder, fat-free, 1 cup
vegetable salad, 2 to 3 cups; ingredients: lettuce, cauliflower,
green pepper, green onions, celery
stewed tomatoes, 1 cup
skim milk, 8 ounces

4:30

raw carrots, 3 small, with salt

Dinner

oysters, 6 large, with tomato catsup
spinach, 5 tablespoonfuls
celery, cottage cheese, and lettuce salad, large serving
steamed turnips, 3 tablespoonfuls
skim milk, 8 ounces
watermelon, small serving

9:30

orange, large

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
Persian melon, small slice
banana, large, with half cup of cream
scrambled eggs with spinach, 2 tablespoonfuls, with half square of butter
wheat-germ waffles, 2 or 3, with 3 squares of butter and half cup of maple syrup
coffee with cream and sugar

9:30

peanuts, half cup

Luncheon

clam chowder, half cup, with 1 square of butter and 3 crackers
fruit salad, peaches, dates, pineapple, orange, with 3 tablespoonfuls of whipped cream
wheat-germ nut bread, 3 slices, with 2 squares of butter
whole milk, 8 ounces
fresh figs

3:00

orange juice, 8 ounces

Dinner

oysters, 4 large, with tomato catsup
spinach, 3 tablespoonfuls, with 1 square of butter
celery and cream cheese salad, small serving
steamed turnips, 2 tablespoonfuls, with half square of butter
whole-wheat roll with 1 square of butter
whole milk, 8 ounces
strawberry ice cream

9:30

hot cocoa, 8 ounces

OPTIMUM HEALTH

Reducing Diet

Breakfast

fish-liver-oil capsules
sliced orange sprinkled with nutmeg
wheat-germ cereal, 2 tablespoonfuls, with half cup of skim milk
clear coffee or tea

10:30

apple, small

Luncheon

broiled lamb chops, fat removed before cooking, 3 medium
fresh peas, 2 tablespoonfuls
tomato and cantaloupe salad; add onion juice and 1 tablespoonful
of boiled dressing
skim milk, 8 ounces
honey dew melon, medium serving

4:30

orange, medium

Dinner

shrimp cocktail, 3 tablespoonfuls, with tomato catsup
broiled liver, 2 large slices
Italian squash, 5 tablespoonfuls
steamed carrots, 4 medium
artichoke hearts and lettuce, large serving
skim milk, 8 ounces
fresh apricot

9:30

skim milk, 8 ounces

SUGGESTED MENUS

Gaining Diet

Breakfast

fish-liver oil
orange juice, 8 ounces
fresh peaches with half cup of cream
wheat-germ cereal with half cup of cream
whole-wheat toast with 1 square of butter
coffee with cream and sugar

9:30

banana, large

Luncheon

broiled lamb chop, 2 small, with half square of butter
fresh peas, 4 tablespoonfuls, with 1 square of butter
tomato and cantaloupe salad with 2 tablespoonfuls of mayonnaise
whole-wheat bread, 1 slice, with 1 square of butter
whole milk, 8 ounces
lemon jello, half cup, with 4 tablespoonfuls of whipped cream

3:00

orange juice, 8 ounces

Dinner

shrimp cocktail, 2 tablespoonfuls, with tomato catsup
broiled liver, small slice, with half square of butter
Italian squash, 3 tablespoonfuls, with 1 square of butter
steamed carrots, 3 medium, with half square of butter
artichoke hearts and lettuce with 2 tablespoonfuls of mayonnaise
whole milk, 8 ounces
wheat-germ biscuits, 3 small, with 2 squares of butter
peach pie with vanilla ice cream

9:30

whole milk, 8 ounces, and 1 inch cube of Swiss cheese

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