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April 25, 1949 - San Fernando Schools

In discussing the problem of nutrition with you, I shall discuss a problem about which there are wide and conflicting opinions, largely depending upon the basis of the fundamental training and experience of the individual discussant, as well as the purpose of his discussion. For example, I shall discuss nutrition with you primarily from two aspects: how can I give you a program which will maintain you and your children in optimum physical condition under the prevailing conditions existing in Southern California today. This point of view has been developed through a study of the evidence of deficiency disease noted in the general population as well as a study of the work of others. In order that we shall have no misunderstanding, I propose to stress nutrition largely from the dietary aspect, yet, as you will see, nutrition is the sum total of metabolic processes that maintain the individual in a state of health or disease, in contradistinction to diet which is the food intake of the individual. Food is consumed by man (make a new slide) for three major purposes: first, for the purpose of locomotion. Few, indeed, are there of us who ^{do not} consume sufficient food to maintain adequate care for all of our needs of physical ~~put~~ put in the way of work. Second, food is consumed for the purpose of maintaining our body heat. The importance of food for this purpose is probably less understood by people as a whole than any other aspect of our needs. People will come to me and say, "But doctor, I have air conditioning in my home, which is insulated from the heat and cold, and I do not need food for this purpose." It is true that in a salubrious climate such as that of Southern California we do not need as much food to take care of the extremes of temperature that we would encounter, say, on Tatush Island. Yet in that air-conditioned home, the body has the purpose to function of drying or moistening the air that is breathed. It has the function of taking care of the excess temper-

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ature that is induced by clothing, by drying furnace heat and by all of the artificial comforts that man imposes upon himself.

Third, the function of food is that of maintaining the body in health.

During the first twenty-five years of life, the body is growing and developing. It is during this period of life that new cells are being added and other cells are being expanded, as the child increases from the average infant weight of seven pounds to the accepted average weight of 150 pounds, of man. Slow though it may be, it requires an enormous selection on the part of our gastro-intestinal tract to choose each microscopic building stone that is essential for the establishment of a fine physical specimen. Here again one must use terms that are widely misinterpreted. In this talk, growth means merely the increase in size while development refers to the completion of the part.

What is required to supply the dietary for an adequate man? Requirements for man's dietary on the basis of the figures of world populations and world food production are estimated that $2\frac{1}{2}$ acres of land per year is necessary for the purpose of supplying him his food. This includes not only the grains, but also meat, milk, eggs, spices and all of the myriads of food entities and accessories that make up his dietary. It is very easy to understand some such figures because of the apparent difference of a man who enjoys the production of $2\frac{1}{2}$ acres of rich bottom land from a man who ~~exists~~ exists on the soil in such a country as India. When you consider that beyond the $2\frac{1}{2}$ acres mentioned for man's food he also requires $1/2$ acre for his textiles and plastics, the story of feeding the world's population becomes arresting.

How does food arise? What is the history? From the study of geology, one can go back to the far distant past when the astronomers tell us that the universe evolved from a whirling mass of gases with a spiral nebulae that gradually, over the millions of years, condensed into a planet, and that energy is the fundamental source of all of the universe.

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As the planets were formed, further energy derived from the sun to weather the rocks to build the rivers and to carry the living rocks down steep slopes and create plants and animals that populate the earth. When one considers the optimum nourished American, the amount of energy and elemental substances necessary to maintain him for one year is stupendous. Let us consider the rainfall, which is necessary to water the crops that he lives on. It amounts to $7\frac{1}{2}$ million pounds of water, which is either brought from the Cina Sea across the Gulf of Alaska and down the Pacific coast, and released from the clouds over our mountains and valleys to water the sands below, and to some degree, it is raised from wells and used over and over again. The composition of man differs slightly from the composition of the plant, but largely man consists of 4 elements: hydrogen, oxygen, carbon and nitrogen, all of which he largely obtains either directly or through the plants that he eats. He also consists of many lesser elements, the first of which are those that ~~1/4/4/4/~~ form the larger portion of his skeleton: the calcium and phosphorous of his bones.

But all of these he obtains from the food ~~hee~~ he eats and the water he drinks. Let us assume that nature has provided for him all of these elements in adequacy, including the minor trace elements, cobalt, manganese, copper, iron, iodine, etc., as well as each of the vitamins, the essential amino acids that go to make up the proteins, the unsaturated fatty acids, the glycerides, phospholipins (?), all of which go to make up the important constituents of his body, the carbohydrates, which, in turn, are obtained from the breaking down of the starches - in short, that his many foods are all in adequate supply. We must then assume something further, ~~1/4/4/4/~~ ^{if} we are going to talk about adequate man. We must also assume that he has come from a long line of adequate men and women. Because ~~of~~ the nutrition of the individual and his ability to utilize the adequate foods that the Planner of the Universe has provided, depends upon the adequacy of the individual, and this, in turn, depends upon the adequacy of the metabolic factors of his

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parents, his grandparents, and possibly further back than that. In our experimental work, it is only the occasional animal from the strain of cats that have been injured by diet that return to the normal pattern.

What has man done to himself? Man was originally, because of the nature of the surroundings in which he sprung from the so-called phylogenetic, truly a carnivore. At that particular time in the development of the earth's history, he found surrounding him many mammals. These were his enemies, and it was natural that he should choose to kill them. As with all other animals, the natural reward of the kill was the consumption of the foe, and therefore, he survived as he became cleverer than the other animals about him - as he developed the throwing stick, the use of fire, and the bow and arrow, and one ^{mechanical} device after the other. It was not until his hunting grounds became depopulated that he found it necessary to use the herbs of the forests and preserve them for his future use. He then began to build houses and to protect himself from other animals. For instance, he built houses over the lakes in Switzerland and began to cultivate certain of the plants that he found that he could utilize. So it was that man gradually shifted from a carnivore to at least partly an herbivore. As man has continued to develop, wherever he lives, he has brought his agriculture with him, and if the area in which he chose to live was incapable of supporting him, he utilized those foods that were available to him. Thus, until the days of modern commerce, when the tin can, the cellophane bag and the refrigerator can be taken to the four corners of the world, he was forced to live under ~~that~~ the circumstances that nature provided. We can then readily see that man is a very adaptable organism. The records of the past show us with great clarity that man has been capable of maintaining himself and reproducing his kind in homogeneity on diets that are almost entirely strictly carnivorous, or diets that are largely herbivorous. However, it is interesting to note that even though a diet may be largely carnivorous, we find evidence that

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these individuals consumed some form of green plant life, while those who have been largely herbivorous have consumed some carnivorous food, be it only milk, eggs or cheese. To the best of my knowledge, there is no people that I have studied that have ~~been~~ maintained themselves in physiological completeness that have not had some source of animal food.

Now that modern society has provided us with the tin can, cellophane bag and refrigerator, we have come into a new ~~era~~ of food culture. This new ~~era~~ is no longer based on the demands and needs for obtaining physiological maintenance, as the demands of the primitive peoples, but has now become largely the problem of economics. The price of the meal that one must pay when one goes to a restaurant is determined largely on the amount of animal protein that appears in the meal. It is through the consumption of meat that the human being can best replace his worn out tissues and rebuild his body.

When I speak of meat, I am not thinking only of steaks, chops and roasts, but also the liver, brain, heart, kidney and tripe, - those portions of the animal that are richest in the vitamins and trace elements, that build adequate men and women.

For a moment, I am going to show slides of a few meals and try to analyse them for you in terms of their adequacy.