

Lecture I - Oklahoma City, June 11, 1949

In March of this year, it was my pleasure to spend three days in your pleasant city as the guest of the Oklahoma City Dental Society to present scientific information on the subject of diet. It is now my pleasure to address another group of you in a popular way.

The problems of nutrition are receiving greater and greater attention in both the scientific and the lay press because of the health failures that have resulted from modern civilization. There is probably not one of you here who has not come with some specific problem which you are inclined to think may be due to a nutritional failure.

In a discussion of a general nature such as I expect to make during the next three days, and the dietary measures and nutritional programs which I shall suggest are not to be construed of a therapeutic nature. Where disease is present, and a dietary program is indicated, the application of the principles that I shall discuss must be left to the discretion of a competent physician. In my own medical practice, the dietary regime which I follow is modified according to the problem for which I am treating the patient.

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Before I launch into my discussion of nutrition this morning, I wish first of all to clarify the meaning of the subject. Nutrition is an extremely broad term, and its implications refer to factors that are even present before birth. As shown on this slide, 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. Unfortunately, it is the concept of the public that a nutritionist is concerned only with the food intake of the individual. This is far from the truth. That is the primary province of the dietitian. The nutritionist is interested in all of those forces, including the heredity and environment, and the dietary phase of the individual's life.

First let me discuss for a moment the problem of heredity, as it affects the nutrition or the physical status of you and me as individuals. In recent years, as the trend to sink the individual into a mass medium has gained an ever increasing foothold on the American people, the family has gradually sunk in importance. It seems to be a common feeling among certain groups that there is no longer much value in ancestry. On Saturday evening, I shall attempt to show you in motion pictures how degeneration of animals can take place through deficient feeding

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from one generation to the other, indicating that experimentally, there is good reason to pay attention to ancestry.

It was not by accident that, historically, some families maintained themselves as the rulers. It has largely been those families who had country estates where they could rear their children and spend their own hours of leisure who continued throughout many generations to hold superiority over the less fortunate. Those country estates were successfully, if not scientifically, farmed, with the view of conserving the soil in living productivity. Those families recognized the importance of rearing their children ^{under rural conditions,} with foods as fresh as possible, activities which would enable them to build strong muscles, children with sharp eyes and keen ears, with a sense of loyalty and responsibility. Those families realized that the success of their children and their grandchildren would depend upon the simplicity and completeness of rural life. In medieval times, princes and princesses were born of those families, whose physical superiority was cultivated from generation to generation. When the machine age came with its great potentialities for releasing mechanical energy, with the mere push of the button or the pulling of a lever, man as an individual began to lose his importance. From time immemorial, the dynasties of the past were established by strong men and strong women of superior

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physical strength, who were able to impose their will upon others.

They passed their strength on from generation to generation until some ruler succumbed to the ways of urban life and his strain lost their superiority and became replaced by others who were stronger.

However, the philosophy of the Americas from the time of their inception has been that of free men who could go to battle with Nature and wrest from nature an adequate living. Should their land perform ineffectually, they could move on, until at last the 48 states were populated; no longer is there room for that type of expansion. Even though we have considered ourselves a strictly free people, there are nonetheless great inequalities in the distribution of the physical assets of our great nation. There are those who have populated the fine valleys with the rich soils that have ~~been~~ produced the great leaders of industry and the professions of our country. The brains of the farm has gone, as the historian of old frequently remarked, to populate the city. Unfortunately, as a recent survey has indicated, such a high percentage of the most intelligent of our rural people have moved to the city, and in some areas, regardless of the agricultural wealth, the intellectual level has dropped.

Those who are to maintain good nutrition must have ancestors who were well fed and raised on foods from fertile soils. It is possible,

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as you will later see in the experimental studies, to restore a poor nutritional status, known to have been poor for two or three generations, to a fair state, and to transmit an improved heredity to the next generation.

Among the questions which are undoubtedly in your mind at this time is "What are the factors referred to that are so essential to the growth and development of the individual, and the maintenance of the fine physique? Excellent physical development has been found throughout the world. Nearly always these people are found in areas where the dietary of the people has been raised locally, is of primitive nature, and is FRESH. In order to illustrate this point, I am showing a few pictures from the collection of Dr. Weston A. Price, renowned dental scientist and world traveller, whose concept it was that in order that we may understand how to make man better physically, it is first necessary to find out where the best physical specimens are found and how they live. As he pointed out many times, the actual factors for adequate physical development are to be found in almost any clime. Those of us who have been trained by a profligate ancestry, ^{who} ~~to~~ ^{ed} slaughter/the bison of the western plains not only for food but for sport, who merely took the choice morsels and left the carcass to rot, and those who remained behind to till the plains in wasteful methods of agriculture, allowing the fertile top soil of our

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great plains to be washed down the rivers to the sea, lost to our civilization, depleting the fertile soil that had taken thousands of years to generate, and who threw overboard the wisdom of their forefathers.

However, urged on by the advancement of mechanical facilities that followed on the heels of the western migration, further depletion has taken place until at the present time our great country is confronted not with the problem of overproduction but with the problem of whether we will be able to produce enough to adequately feed the American people.

Modern food is produced in such a way that man need have no fear of flood, or storm or conflagration. Starvation from lack of calories for the people of the United States as a whole is almost unthinkable. However, has this great feat of modern distribution been accomplished? First, the produce of the farms has been delivered to the great centers of distribution. No longer in the urban community does the individual farmer sell his wares to the ultimate consumer, but the greater portion is shipped to the processor who purchases or contracts in advance for the produce of his land, the grain, dairy products, meat, poultry, fruit or nuts. Now, the purveyor of sea foods can contract to send his catch to the distributor. Not only does the farmer turn over his produce to the

distributor, but he has gradually become a mono-cropper so that he, in turn, purchases his living from the great metropolitan centers.

What has such methods of distribution necessitated? First, the foods that were formerly sold fresh from the fields and in season are now picked green in order to preserve their marketability, or, if wilted, are revived many times before they get to the consumer in the fresh food markets. Cereals are processed in such a way that they may be preserved. The germ, the valuable proteins, the fats, the oils, the minerals, the vitamins, are removed, either to be sold back in the form of expensive drugs, or are used as cattle feed, or are discarded. Even the grain that we feed to our live stock has in large measure been subjected to heat to prevent it from sprouting and to destroy the active living fraction within it. Our meat, poultry and fish consist largely of the muscular portions and those portions of biological worth, the nuclear proteins, the unsaturated fatty acids, the minerals, hormones, vitamins, are removed by the processor and either discarded, made into various expensive pharmaceuticals, or turned over the by-products plants or used for poultry and animal feeding.

So it is that modern man has gradually devitalized his foods until such time that he now is compelled to utilize a dietary which does

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not offer for him the adequate factors to build good sound bodies.

It is true that we have conquered much of the source of the infectious diseases, but in turn, we are entering into an era of new problems, such as the deficiency diseases, arthritides, heart troubles, cancer, mental deficiency, and the dependent instead of active old age. The presence of these problems in earlier American times was scarcely noticeable, now they dominate the field of medicine. High infant mortality of earlier times was ^{largely} due to infectious diseases. We still have a high infant mortality due to entirely different causes.

In order to carry on the processing which appears to be so necessary to the preservation of modern man's food, we find that his methods of agriculture have been depleting the soils. Also, since the war, we have been exposed to the promiscuous use of some of the most poisonous of chemicals which, in turn, are daily causing serious illness among large groups of the American people, all in the interest of destruction of pests. Because of the inefficient soil on which much of the food is produced, it is estimated that the average American must spend at least \$15 for vitamins in order to have good health. It is a recent thing that liver has been found to contain elements of highest biological properties, though its biological worth is destroyed at even low temperatures. Brain, too, contains valuable fats and other vital elements necessary for replenishing our own ^{exhausted} supplies.

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Kidney stew, a favorite dish of the English, goes begging in the average American home. Tripe, made into Philadelphia Pepper Pot, is known to few but the gourmet. The excellent raw oyster has a limited place. Though sea food is popular in the high class restaurant, its home consumption is relatively small. Shad roe or milt or other of the valuable foods of fish origin are rarely considered by the average American - also smoked herring, smoked salmon or caviar, are only looked upon as foods fit only for peculiar people of peculiar taste.

With the loss of vitamins, minerals, fats, oils, highly valuable nuclear proteins in our cereals, where, then, can we get the essential vitamins? from the great array of 14 B vitamins and others down through Vitamin U which is obtained from raw green cabbage? Is there a single dependable source of complete balanced artificial vitamins that we can depend on for supplement? I think not. Yet there are more than vitamins; there are the nuclear proteins, which are essential for replacing the organs of the body as they wear out. There are the vital amino acids, such as tyrosine, tryptophane, the sulphur bearing compounds that are so essential to the formation of the skin, hair and nails, as well as bone and cartilage. Pickled pigs feet, head cheese were formerly considered delicacies on the American farm, yet in the average urban community, these are used very little.

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These, along with chicken or turkey feet soup, rich in collagenous materials that are valuable elements that are necessary to our bones and joints, also liverwurst, blood sausage, etc. offend the delicate sensibilities of the modern housewife, who does not provide them to her family. One could list many other foods that have been used by various groups of people from early times, from the live fish of the Japanese (which caused such a sensation in the news 25 years ago) to other so-called off dishes, and it affects us emotionally. Yet the liberal use of foods of this type, which we, in our modern civilized, sterilized emotionalized society, have cast out, would maintain us in the same general physical condition ^{of} ~~that~~ the primitives whom Dr. Price visited, and would permit us to maintain such health from generation to generation.

One of the foremost difficulties that encounters the nutritionist is the established eating habits of the people whom he advises. In general, it is found that a family of children accept what their Mother prepares, and she, in turn, prepares what she is fond of, as well as dishes she has found that her husband particularly enjoys. Take that family visiting for a meal where there is no choice, and the chances are that several of the dishes served will not be touched by the youngsters, or one polite bite taken. Why? The food is prepared in a

manner unfamiliar to the child, it looks different, and immediately the child concludes it does not like it. It is also quite likely that the man of the house will endure a strange dish but will barely taste it. His wife has more social sense and may struggle through a normal serving, but a sharp hostess observes that she has served something strange and not acceptable to her guests. Keeping the spirit of adventure alive/^{for new foods} in the child's breast is pretty difficult if his parents have not made it a point of serving a variety, of being interested in trying new things themselves, and of starting out with the assumption that it not only would be enjoyable to undertake new foods, or new methods of preparation, but even might be useful.

LECTURE II

This morning, I spoke to you about the effects of adequate diet, and showed you some slides of primitive people who had maintained themselves adequately and reproduced in homogeneity from one generation to the next, by the use of ^a dietary containing all of those necessary factors for proper growth and reproduction. We also note that such dietaries ranged from a high vegetarian diet to a high carnivorous diet. Therefore, it is obvious that when one speaks of "adequate diet", he can speak of a wide range of food selection. The first point, however, is to note that in all of these dietaries, there was both an animal product as well as a vegetable product. Even Steffanson, Peter Freuchen, McMillan and others who have discussed at length the dietary habits of various peoples from the frozen North, have stated that some vegetable substances, whether the content of the stomach of the carabou, or the sea weeds found in the stomach of the walrus or green mosses consumed from the springs, all have been parts of the dietary of carnivorous peoples. If we are dealing with a vegetarian people, such as Price describes among the Jeland Swiss, we find that they consumed animal products - milk, cheese and butter. Even the Hunzas, who lived in the high Himalyas and were described by

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McCarrison as being the hardiest people in the world lived largely on fruits and vegetables grown at the foot of the high mountain glaciers, and consumed some milk, cheese and flesh.

So it is obvious then, that man, like the other animals, requires a certain amount of both vegetable and animal substance to reach and maintain a full development. Primitive people who are primarily carnivorous in habit have usually depended upon wild game as the chief source of their meat supply, such as the walrus, the seal, the polar bear, the carabou, and the fish that largely constitute the dietary of the Eskimo. Those peoples living in the Islands of the Pacific largely depend upon their skill to catch the teeming multitude of fish that abound in the water surrounding their islands. Likewise, the crustaceans^{and} moluscs abound in the water off the islands, and constitute the major portion of the food of these people. Yet the taro root and the cocoanut along with certain other foods and sprouts, are necessary adjuncts to the completeness of their dietary. Inasmuch as these peoples represent tribes that have not^{extensively} populated the areas in which they resided, and that the communities in which they dwelled are largely limited by the supply of food available to them, these primitive peoples have sought ways and means of limiting the number of

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offspring that were allowed to survive, which is, as you see, entirely opposed to the attempt of a modern civilized community which not only attempts to raise those of the community that are most able and most admirably fitted to procreate the race, but those of physical^{and mental}/inferiority .

Inasmuch as the humanitarian philosophy of our day requires that these inadequate individuals be given an equal opportunity with those who are well endowed, the problem of adequately feeding and providing for an ever increasing group of physically disabled people weighs heavily upon those agencies which are entrusted with their responsibilities of securing the 148 million people of the United States with an adequate dietary. The problem of feeding other parts of the world has also become our problem since we are recognized as the leading nation in production.

In calculating the food of the average man, woman and child throughout the world, it is estimated that $2\frac{1}{2}$ arable acres must be available for the production for each individual's food, and another $\frac{1}{2}$ acre for his plastics and textiles. However, the $2\frac{1}{2}$ acres of land available to the average citizen of India, with its $4\frac{1}{2}$ bushels per acre average production is entirely different from the $2\frac{1}{2}$ acres in the American corn producing areas which average approximately 57 bushels per acre. The high producing hybrid areas of the north central corn belt produce an entirely different food

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than the less than 20 bushel per acre of certain of our southern states.

Therefore, truly, indeed, is the man "in clover" who has that fine

producing land that will not only produce the 100 bushels of corn

per acre, but the high proteinogenous crop and the fine live stock

that go to produce his livelihood.

For one moment, consider man's position with reference to agriculture, and let us consider that he is one of those fortunate Americans who has available to him the equivalent production of 150 bushels of corn per acre. This does not for one moment assume that he is to eat that corn in the form that it grows from the ground, but that it will come to him as meat, eggs, cheese, milk, butter and his vegetables and all of the other foods that make his dietary adequate. Such an individual, if he were to get his foods fresh from the farm, and in season, and not only consume the muscle parts of the meat but the visceral meats as well, and not only the white flour or the de-germinated cereals to make the porridge and bread stuffs, but the germ as well; with his vegetables fresh and crisp, his milk as clean and pure and undestroyed by processing; such a man would be living adequately and would be developing in relative homogeneity depending upon the soil conditions of the area that supply him with his foodstuff. For there would be those acres where there

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would be tall men, and those acres where there would be ~~short~~men,
depending primarily on the mineral adequacy of the soils on which the
crops were grown.

Let us for one moment consider man's position with reference
to the factors of energy that run the universe. First, let us consider
some of the factors and elements necessary to produce 100 bushels of
corn.

LECTURE III (Movie Night)

(Carefully explain basic diets)

This evening, I intend to show two reels of motion picture film that show ⁱⁿ ~~the~~ action the results of some very interesting studies of the effect of heat processing of foods on the growth and development of the cat. I became interested in this problem because (historical discussion)

Heat processing of our foods, even when one takes into consideration frozen foods, constitutes the most important single procedure utilized in the preparing of modern man's dietary. It dates to the time in prehistoric ages when man first learned to use fire. When he found that by heating his kill it would keep it from decomposing, when he found that by heating his javelin point he could make a hard piece of wood that would better penetrate the hides of the animals he was hunting, he used his campfire not only for the purpose of protecting himself from other animals who were frightened by the glowing embers, thereby protecting him and his offspring, ^{but} ~~by~~ somehow he learned early that he could prepare certain of the wild herbs that grew in his environs by the processing of cooking. Today, however, with pressure cookers and () and large elevators that kiln dry the grain for our stock, man has come to apply heat in some form to almost every process of food preparation. He purifies his cane syrup

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until it becomes a pure chemical devoid of protective substances ~~and~~
in large refineries. This film this evening was prepared solely to show
what the simplest process of heat applied to meat and to milk will do to
the cat from one generation to the next.

DISCUSSION OF DR. LEHMAN'S PAPER ON PESTICIDES

The problem of pesticide poisoning is apparently becoming more and more serious. Patients who have become saturated with the organic chlorinated hydrocarbons or other pesticides and herbicides, are showing the ravage of these poisons.

Historically, in 1945 I became aware of the fact that I was seeing unusual frequency of mild hepatitis in my practice. This was coincidental with the first release of the DDT bomb for civilian use. I also became aware of the fact that many of the young men coming to my office, after their return from the South Pacific, presented evidence of icterus. They also showed symptoms showed by others in my practice of a higher cholesterol than normal.

In 1946, I obtained the first conclusive evidence this hepatitis was probably being caused by pesticides and DDT in particular. In this instance, a public health nurse was employed in fly control work where a DDT bomb was placed in a closed room. She immediately suffered from syncope, tachycardia, and a prickling sensation about the heart, which lasted for several days, also circumorbital bronzing, a slight icterus of the sclera.

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In 1947, I saw increasing evidence of the same syndrome, circumorbital bronzing, icterus and evidence of hepatic damage. In some cases, this was accompanied by gastro-intestinal upsets in which there was evidence of pain in the epigastrium, followed in a few days by influenza-like attack which has been commonly called in this area Virus X. Allergic individuals showed a definite aggravation of their allergic symptomatology, and in arthritides, there was definite evidence of increase in pain. These symptoms usually occur about ten days after the known exposure. The treatment of these cases was most baffling, inasmuch as ^{they} in no way responded to the usual methods of treating acute respiratory infections of gastro-intestinal ~~up~~ upsets. In one instance, the acute symptomatology of an entire family was traced directly the spraying of a dairy with DDT. The symptoms of illness occurred three days later.

Recognizing that this syndrome or circumorbital bronzing, icterus and respiratory infections, tachycardia, prickling sensation about the heart, aggravation of the allergic manifestations, aggravation of the pain of arthritis was undoubtedly associated with liver damage, particularly because of the icterus, we began to study what effect we could find. It had been previously reported that the pyrophosphates group showed definite evidence

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of destroying the cholestrolase in the liver.

Beginning in the summer of 1947, the condition which we had previously noted took on certain new phases inasmuch as the ? gastrointestinal upsets became much more prevalent. It was during this time that the pyrophosphates had become much more extensively used in agricultural culture, along with the herbicides and plant hormones. It is quite evident to one who is studying the problem that this syndrome is ~~characterized~~ ^{connected} not only with a single entity such as DDT but in all probability is associated with pesticides and herbicides in general. It was also noted that persons who had had previous episodes of illness due to the poisons were much more susceptible to secondary episodes than others. We also noted that individuals of better nutrition than average, and particularly those on the slightly plump side were much more affected than those of lean musculature. We found that women who had undergone hysterectomy were highly susceptible, just as was reported in the work with DDT on rats. We found that people of hard musculature, living in the open air, were relatively immune.

In the fall of 1948 and the spring of 1949, the gastro-intestinal symptoms complained of by many of these individuals were typical of gastric and duodenal ulcer, and in other instances, like gall bladder.

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X-ray observations on a number of these individuals indicated a pyloric spasm with the evidence of ulcer. In one instance, the individual was known to be exposed to large quantities of DDT, parathione, monochlorobenzene, dichlorobenzene, while another patient developed a perforating ulcer.

Three of her patients in my practice have come to surgery for acute appendicitis. In one instance, the fat from the incision examined by Dr. Lehman showed 10 parts per million DDT. Her ^{original} exposure dated back to the summer of 1946 when she used a bomb in her summer beach house. She had used aerosol in solutions about her home periodically since that time.

I am showing herewith four slides showing first a case of acute DDT poisoning- poisoning which was the result of the use of spray around the back porch, close to the bedroom where the patient slept, over a period of a few days, at intervals over a period of a year and a half.

This patient developed acute dermatitis that was seen, and showed the evidence of pesticide poisoning. ^{We record} The basic cholesterol level, using the same laboratory, with the same standards of normal. We find that in DDT poisoning there is first, an increased icteric index of low value,

which gradually increases, and sometimes has reached levels as high as 21 & 22.

The standard icteric index as given by the laboratory employed is 4 - 6.

Usually when treatment is employed, the icteric begins to fall by the end

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of ten days, and the cholesterol begins to climb. Normal cholesterol runs around 140 - 160 mg. The laboratory bases its limits of normal between 140 - 180. In cases of acute pesticide poisoning, the cholesterol increases to between 200 - 250 mg. In extreme cases, it has increased to over 300. It has been our experience that all ordinary methods of treating respiratory infection, acute exacerbation of allergic manifestations, exacerbation of arthritic pain and the gastric enteritis do not respond to usual treatment. In many instances, the employment of such a cathartic as castor oil is accompanied by increasing symptomatology and the inability to move the bowels over a period of three days. Saline cathartics, such as citrate of magnesia and the phosphates-phospho-sodas have proved the best means of treatment of these cases. Other methods of treatment which we have found most useful are: 4 units crude liver extract daily for ten days, and a continuation of 4 units daily twice a week for thirty days; use longer in extreme cases. With the first dose and in extreme cases, use daily 250 mg units of potent adrenal cortex, administered with the first dose. If extreme prostration is present, the cortex is administered daily for ten days.

LECTURE V

On Saturday night, I outlined to you the history of my interest in the problem of nutrition, and showed you motion pictures of some of the experimental animals that we had studied over a period of some of the experimental animals that we had studied over a period of year. This morning, it is my purpose to show you a series of slides showing demonstrating lesions that we have found in the skeletal system of the cat, and those found in the human being, with an explanation of the dietary indiscretions of the human, and also those which we were able to control experimentally in the animal.

One must issue this warning in the beginning of such a discussion, that frequently there is a species difference, and so it is not always possible to carry over the findings of the laboratory to the findings in the human being. However, in regard to the problems which I propose to show you this morning, I am presenting a series of findings in which there is an attempt to correlate the experimental findings in the cat with those in the human being, other correlations between other types of animals, both herbivorous and carnivorous, can be made. For my own part, I have spent much time studying fine cattle and other domestic animals, having long laboratory experience with guinea pigs, rats and cats in particular. These studies again deal largely with the heat processing on food.

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I do not want to leave with this audience the impression that I am advocating ^{that} all foods should be fed in the raw state. I certainly do not follow this procedure myself. I believe that modern man should use those temperatures only sufficiently high to properly prepare the food both for appetite appeal and for the preservation of their nutritive value to as large extent as possible. In America, we have a very definite food culture which has resulted from our machine age, and our methods of food distribution. In the ~~eyes~~ eyes of the foreigner and of the gourmet, the average American diet is very colorless and relatively flat. No small portion of the American public in their normal home life lives largely from the cellophane bag, the bottle and the tin can, using fresh foods largely for consumption when they eat out. Not long ago, I was talking to a mining engineer who had spent years in foreign lands, and he said one could always tell when an American prospecting company had been ahead of them by the trail of cans left behind. Peoples of other countries are more apt to live off of the land.

As to the use of raw foods in the dietary, Americans commonly use fruit and salad greens. As pointed out in previous lectures, other peoples use various meat products, fish, and sprouts. The main point is, what factors are destroyed in heat processing that are of value?

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I might point out that there is no perfect diet, and diet can be complete and be of different types. However, regardless of whether it is chiefly animal or vegetable, a part of the complete diet will consist of a small part of the other type of food.

(Describe Belle Benchley's experience at the San Diego Zoo)