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Abstract Of Notes Of Lecture Delivered By

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Los Angeles, California, May 1941

Note: This abstract is made available from the stenographic transcription of the notes of the course and edited by Dr. Page. It is made available to the students without endorsement of the Academy and without responsibility for the accuracy of the statements made herein.

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The science of dentistry, as well as the practice of medicine, has made rapid progress in the last few years. At the start a dentist was little more than a mechanic. Because there is so much mechanical work to do in dentistry there is a general misconception that the field of dentistry covers only mechanics. This is chiefly due to a failure to correlate the known facts possessed by the medical profession with the known facts possessed by the dental profession. It will be the attempt of the speaker to show how oral conditions are intimately related to the other conditions of the body, to show that little distinction should be shown between them, and that proper nutrition is of vast importance to both.

Much of this situation has come about because the etiology of the most familiar dental pathology was unknown. Newer knowledge in the dental field, in nutrition, endocrinology and other aspects of bio-chemistry has thrown much light on the causes of dental decay and pyorrhea. It is now known that the causes of these almost universal diseases are chiefly systemic. Not only has this new knowledge opened the way to advancement in the field of dentistry, but it also has opened up an entirely new field in the practice of medicine. The causes of the degenerative diseases have been as unknown in the medical field as in the dental.

As bio-chemists we look upon the human body as either a good or a poor culture media for bacteria. We look upon disease in a little different way from the customary one of the medical profession. Our aim is threefold:

1) to determine what chemicals constitute a normal healthy body
2) to determine the extent of variation from the normal of each unhealthy individual
3) to determine how to correct the variations.

In order to arrive at these determinations a measuring stick is necessary. The search for this measuring stick was made through the trial and error method, a process which entailed endless work and discouragement. Dr. Price started this work but arrived at no definite conclusions because of failure to find one important thing -- that two minerals, calcium and phosphorus, are used by the body to form a compound, "calcium-carbono-phosphate," according to Borille or carbonate apatite, according to Hastings. By testing those without dental and oral conditions, those with these conditions, and determining at what calcium-phosphorus levels these conditions ceased to exist, it was found that two and one-half parts of calcium to one part of phosphorus was an indication of a normal body chemistry.

In the past there was no effort to make the calcium tests accurate because combinations had no meaning. But now that the test has meaning and the proportion of one mineral to another is of diagnostic value, an accurate method has been worked out for

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the testing of the calcium-phosphorus levels of the blood. It is done by testing the unknown quantity against a known. When potassium permanganate is dropped into calcium, the permanganate loses its color up to the point where the calcium is no longer of sufficient strength to produce this chemical change. By measuring the amount necessary to attain this step the amount of calcium in a given solution can be determined. A known amount of calcium is used in one tube and every time that an unknown is run its residual color is matched with the residual color in the known. The difference resulting from dropping one drop into this unknown calcium may amount to as much as a milligram in your final determination.

Through the study of the calcium-phosphorus metabolism of the body, it has been determined that teeth as well as other tissues of the body need a continuous and adequate supply of building materials for their well-being. The building material for dentine, which is the same as that for bone, is the compound carbonate opatite. Conditions are suitable for its deposition when the usable product of the two minerals of the blood equals thirty. If the supply of this material is continuously below a certain level, the dentine becomes poorly nourished and non-resistant to bacterial invasion. If a goodly supply of this material is present in the blood stream, dentine is well nourished, dense and resistant to bacterial invasion. When this was discovered, various attempts were made to change the susceptible to the immune by raising either the calcium or phosphorus levels of the blood or both. This did not meet with success until it was discovered that it was not chiefly the intake of these materials in the food that was the deciding factor as much as it was the assimilation of these materials from the food. Eventually it was found that the chemistry of the body determined the degree of assimilation and that this body chemistry was controlled by the endocrines and the autonomic system.

The autonomic or unconscious nervous system is composed of the endocrines or ductless glands of which there are two antagonistic groups. The sympathetic is the speed-up side and has the thyroid, adrenal medulla, gonads, and anterior pituitary glands, as opposed to the parathyroid, adrenal cortex, Isles of Langerhans of the pancreas, and posterior pituitary of the parasympathetic or slow-down side. These glands or endocrines secrete substances called hormones which pass into the blood stream and thereby effect the whole body chemistry. Dysfunction or lack of balance of the sympathetic endocrines predisposes people to infectious diseases, to cardio-vascular troubles, cancer, etc. The parasympathetic dominance predisposes people to the depositing diseases such as arteriosclerosis, cataracts, etc.

When the calcium-phosphorus levels of the blood were out of balance, it was found that increased amounts of these minerals added to the diet did not markedly effect these blood levels. But when certain endocrines, those on the sympathetic dominant side were stimulated by gland extracts, the phosphorus level rose, and when the parasympathetic endocrines were stimulated by gland extracts, the calcium levels rose. This indicated that the endocrines were the controlling factor in assimilation. Small amounts

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of gland extracts create the opposite effect of large doses, and it was found in general that small doses of insulin would raise the calcium and minute doses of thyroid would raise the phosphorus content of the blood. We use never more than .1 of a grain of thyroid daily to raise the phosphorus level and lower the calcium level. The use of insulin is in opposition to the use of thyroid. We treat patients with insulin to boost the parasympathetic side. In doing so, we raise the calcium level and lower the phosphorus.

In the past there has been no means of knowing when to give thyroid or how much, therefore, the accustomed practice in the profession has been to give large amounts of thyroid extracts almost promiscuously. Unless part of the thyroid gland has been removed or we have a severe endocrine case, no more than .3 of a grain of thyroid should be given and for only short periods of time. This is only a temporary booster. No endocrine treatment should be undertaken without using nutritional treatment because you will only be supplying a crutch and at the same time keeping the patient permanently crippled. If therapy is used correctly, all disorders disappear and the patient need no longer rely upon endocrine substance.

We see endocrine disabilities in every person in this room. We are talking about things that happen to nearly everyone, loss of hair, obesity, and thinness; all are endocrine disorders as well as dental decay, which effects ninety-five percent of the population. Usually dental decay can be corrected by nutritional means alone. Only when the disorder fails to respond to this treatment and we want to get quick results do we use endocrine products as supplementary medication. The picture shown on this chart gives the history of a mistake. This girl, twenty years old and subject to dental decay, had a pulse of 82, was thought to be a parasympathetic. We gave her a blood test. Phosphorus was 3 mg, which would require 2 1/2 that amount or 7 1/2 of calcium, making a usable compound of 22 1/2. This is below 30, the required point for immunity to decay. By nutritional means we raised the calcium level a bit, but the test showed the phosphorus at the same point. Since nutritional means alone were not quick enough, we gave her .1 grain thyroid and made conditions worse. Then we changed to 3 units of insulin and increased that slightly, but not above the danger point. (Insulin when given to diabetics is sometimes given in doses of 75 to 100 units, so you see how small an amount is necessary for our purpose). She became immune to dental decay and this was registered in the calcium-phosphorus levels which rose to a point where their usable product exceeded 30. The insulin was a stimulant for the parasympathetic nervous system which had an insufficient output of natural insulin due to endocrine dysfunction. In such cases you keep the patient on insulin as long as necessary and make the tests to determine how long to continue. Except in rare instances, all cases having high phosphorus and low calcium are sympathetic dominants and will require insulin. It is usually given three times a week until the calcium level is gradually raised.

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The treatment indicated for the restoration of chemical balance is two-fold. 1) The temporary use of endocrine extracts. 2) Correction of the diet to obtain normal function of the endocrines. As for nutritional treatment, by chemical analysis it has been found that the endocrines contain the greatest concentration of vitamins and minerals of any parts of the body. This would indicate that in order to have normal endocrines functioning efficiently of and by themselves without stimulation from outside sources, the diet must contain adequate vitamins and minerals. I take it for granted that you understand the dietary requirement of carbohydrates, proteins, and fats, and I do not mean to minimize their importance by giving them scant attention. But at present the public is vitamin conscious due to the newness of discovery, and the public is not yet aware of the importance of minerals. So these two elements will receive more attention in this series of lectures than the well-known carbohydrates, proteins, and fats. Emphasis will also be placed on certain foods which upset the chemical balance of the body. Sugar is the worst offender in this line. It is a very refined product and is so to such an extent that it might well be classified as a drug. To illustrate its effect on the calcium-phosphorus level, I will cite the case of my assistant. She is immune to dental decay. She is eating kelp and not eating sugar. Her proportions of phosphorus and calcium are balanced. After eating nine chocolates, a test was given and we found that after two and one-half hours her phosphorus level was reduced sufficiently to lower the usable compound. This continued low for twenty hours. If she were to continue eating this amount daily, she would have had plenty of decay.

Tests have taught us that nutritional requirements of people differ. The reason for this is heredity. The individual requirements are established before birth. Nordic types still need minerals found in sea food. They get along very well on a high protein-low carbohydrate diet, whereas Mediterranean people require the reverse. The Nordics and their descendants have different physical characteristics than the Mediterranean people or the inland Europeans. Their body mechanisms became adapted over a period of hundreds of generations to a certain diet. The Nordics are blue-eyed and have long heads, the Mid-Europeans have brown eyes and round heads, and the Mediterraneans are betwixt and between. These physical characteristics indicate certain racial types. Their dietary needs are determined by their hereditary environment which has existed through the centuries. But through generations of inter-marriage we get not only clearly defined types, but all manner of variations. And since endocrine patterns do not always fall into definite classifications - this is especially true where we find serious problems of dysfunction - diagnosis becomes very complicated. However, it is safe to say that in general the blue-eyed, long-headed people need more minerals and less carbohydrates than brown-eyed, round-headed people. Unfortunately, most people today, whether living on the coast or inland, eat a rather standardized diet and a large proportion of this is composed of refined and devitalised foods. That our bodies have not been able to adapt themselves quickly enough to these dietary changes is

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evidenced by the increase in the degenerative diseases among so-called civilized people during the past hundred years. It is time that someone like the bio-chemists stepped in and discovered the needs of the body from a chemical point of view and facts about its chemical processes and their relation to food.

Thus far the bio-chemist, having the three-fold task of determining the chemicals necessary to a healthy individual, the variation from it and the means of correcting the variations, has found the three-fold facts that the bony structure of the body requires a balance of 2 1/2 calcium to 1 of phosphorus; that this balance or lack of it indicates the efficiency of the endocrines and the autonomic system and that the endocrines depend upon nutrition for the proper building materials to make them work effectively. This knowledge gives to the bio-chemist an opening wedge to the curing of human waste. There is much yet to be learned, but the facts which we have obtained should stimulate the interest of real humanitarians in further progress along this line. In the treatment of the degenerative diseases both oral and systemic, the body of the individual is the all-important factor. Causes must be determined if possible and these causes corrected. The practicing bio-chemist is not so much concerned with the treatment, results, or symptoms of the pathology as he is in the removal of the underlying causes. The calcium-phosphorus test indicates cause, points the way to treatment, and registers effectiveness of endocrine and nutritional correction.

(A) What has been your experience in the use of Vitamin D to reduce calcium levels?

(Q) No more relation than any other imbalance essential to nutrition. All things are important in the diet, no one thing must be left out. The relative degree of importance is still a question. The mere fact that we can change blood levels through the endocrine products means that those things work through the endocrines and not just by themselves. This would seem to suggest that just having the proper things in the diet is not sufficient so long as the endocrines are unable to use them because of dysfunction.

(Q) How do you account for so much decay from fourteen to seventeen years?

(A) At that time our demands are much greater than after growth is obtained -- we need only supply material for maintenance after growth is reached -- disturbance is greater at puberty -- gland changes are taking place -- the calcium-phosphorus is unbalanced.

(Q) What have been your findings of increased caries during pregnancy?

(A) If proper care had been provided beforehand, then no trouble,

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but if caries prevailed before, then they become more numerous since requirements are greater, the deficiencies become more pronounced. Dental decay is easy to prevent, but arthritis, which is related to it, requires a much finer chemical adjustment.

(Q) What about the calcium-phosphorus levels of children?

(A) Calcium levels in children are comparable to calcium levels in adults, but phosphorus levels are from 1/2 to 1 1/2 mg. higher, depending upon the rate of growth. Usually dental decay in children can be determined by the calcium level. If it falls below 8.7 m, they are susceptible and usually subject to decay. We need more phosphorus intake in food than calcium. Excretion of phosphorus is higher and the intake of these minerals does not necessarily have any relation to their levels in the blood. The blood levels merely indicate the assimilated amounts. A 10 to 4 ratio of assimilated calcium-phosphorus in the body is necessary to make good teeth.

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The practice of medicine, both dental and medical, has been almost entirely along the lines of the theory of infection as the cause of disease. In this field much progress has been made, but it has met with practically no success in degenerative diseases. According to the opinions of some people, the new approach is the approach from the angle of the individual rather than of the symptoms of the disease. The new approach makes it possible to do preventive work and often to reverse the process of disease. It depends upon determining the mechanism and peculiar pattern of the individual rather than the percent of people helped or not helped by a certain drug. It depends upon the individual and his makeup - the balance or lack of balance of his autonomic system. Our understanding of the autonomic system is not complete, but we do know that the endocrines are a part of this system. The autonomic or unconscious nervous system has some contact with the central or conscious nervous system and can be influenced by it. Grief, worry, and happiness effect it. The autonomic is composed of two antagonistic parts, the sympathetic and the parasympathetic. One slows up and the other speeds up reactions, together they serve to guide all processes of the body. When we have nutritional causes of disorders, the same causes may result in one individual becoming a sympathetic dominant, while another becomes a parasympathetic because they inherit different tendencies. We are chiefly interested in the autonomic nervous system because it effects the assimilation of foods - all processes are controlled by it. When the system is out of balance we find that our assimilation of food may be out of balance. All of these things promote an endocrine problem. The natural correction is nutritional. As the two sides of the autonomic system are opposed, so various endocrines are

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opposed. These are not always the same endocrines, but in general, as shown on this chart, the thyroid, adrenal medulla, gonads, and anterior pituitary glands are on the sympathetic side, and the parathyroid, adrenal cortex, Isles of Langerhans of the pancreas, and posterior pituitary glands are on the parasympathetic side. In illustrating the action of the endocrine glands, one of the best ways is to liken them to a rowing crew. The two sides must row with equal strength; the sides must balance, although the weight, etc., may make variations in pull of individual rowers. The pituitary gland is stroke and can in a measure offset slight lacks of balance. The pituitary can neutralize or compensate to a certain degree, but when the pituitary cannot overcome the difference, then we have lack of balance - unequal pulling power on the two sides with lack of chemical balance and a tendency towards disease.

In stimulating the weak side of the crew, we give endocrine preparations. The amounts which we use makes some difference. Small amounts often have the opposite effect of large ones. We use small amounts for a stimulating effect, but we have first to discover, of course, which glands are out of order. Ordinarily, the thyroid is on the sympathetic side, however, it is occasionally reversed as may be some of the other glands. In some cases, in what are apparently thyroid dysfunctions, we can give large quantities of thyroid extract. Still, if more than one-half a grain per day is given, the chances are that that is not the gland that is chiefly involved. Probably it is the anterior pituitary, and if such is the case, a little anterior pituitary extract given in conjunction with the thyroid will reduce the amount of thyroid needed. When we use insulin because the pancreas is putting out less than its normal supply, we use it in small quantities to stimulate the parasympathetic side. But many times a little of posterior pituitary along with the insulin will reduce amount of insulin needed to a remarkable degree. In this work it is found that 1/10 grain thyroid or 3 units of insulin are generally sufficient to create the desired stimulating effect on the sympathetic or parasympathetic branches of the system. There are numerous non-diabetic uses of insulin. Many cases of fractures have been helped considerably by the use of small amounts of insulin, but it has to be used on the individual correctly. A sympathetic dominant can use insulin to advantage, however, if parasympathetic, better use thyroid. We determine what the patient is and then we can try one of these things - using it as a means of diagnosis - what is one man's meat is another man's poison. What is treatment for the parasympathetic is opposed to the treatment of the sympathetic. It is this difference in distribution and influence upon the autonomic system that makes this work interesting; that makes diagnosis a little bit more than just simple.

Either side of the exact line of balance between the parasympathetic or slow-down side and the sympathetic or speed-up side we have a symptom free or safety zone. There is a greater margin of safety as regards dental conditions than other conditions of disease. As previously mentioned, when the product of the calcium and phosphorus levels exceeds thirty there is immunity to dental

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decay. However, to be just barely within that figure still leaves one susceptible to the degenerative diseases, and so we must seek a finer adjustment between the opposing gland groups.

As would seem logical, greater strength of the slow-down glands predisposes people to a different type of disease than the greater strength of the speed-up glands would.

Since the parasympathetic endocrines determine the assimilation of calcium, we find in disorders of this type that there is an excess of calcium in the blood stream. That is more calcium than the phosphorus is able to use up. This excess calcium may be likened to the sediment in a muddy river. Just so long as the water or blood keeps in motion, just so long will the particles remain suspended. However, when water comes to a stagnant place, the mud settles, and when the blood comes to an injured section of the body, its flow is reduced and the calcium begins to deposit. As a result we have cases of arterio-sclerosis, cataracts, and chronic arthritis. Since the cause is not a growth - that is seemingly a symptom in the case of cataracts - is not - merely an infection, as often thought in arthritis - and is not due to lack of exercise or advancing age, as thought in cases of arterio-sclerosis, but is the common cause - excess calcium being deposited in varying places of injury - our treatment should be to correct the calcium level. By giving thyroid we will reduce the calcium level and raise the phosphorus level. The increased amount of phosphorus will use a greater amount of calcium and we will begin to attain balance. The result from this treatment will be the cessation of calcium deposits, and where the disease is not too deeply seated, where circulation is still going on, there will be a reversal of the process and the calcium deposits will tend to be eaten away. But I cannot stress the fact too much that nutritional treatment must be used with endocrine extracts. The patient must eventually be weaned from this temporary crutch of medication. And we cannot do that unless we supply the materials with which to build organs of permanently good function. The building materials of the body come through the food which we eat.

When the sympathetic part is dominant, it is generally characterised by high phosphorus and low calcium and produces those diseases which are due to insufficient calcium or excessive phosphorus. They are all acute; arthritis, diabetes, etc. We also have a certain type of dental caries in sympathetic dominants. We find that this takes place under the margin of the enamel and is best seen in X-ray as a gradual shading of the dentine and actual etching of the bony structure - loss of calcium in the dentine itself. You see phosphorus has an affinity for calcium and when there is an excess of phosphorus in the blood stream and an insufficiency of calcium in the blood stream for it to feed upon, the phosphorus runs around taking its necessary calcium from other parts of the body. Angina pectoris, as far as our people can determine, is always on the sympathetic side. Although my experience with this is limited I believe that it is almost always a symptom of trace mineral deficiency, because the use of kelp

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(which containes the trace minerals) has done remarkable things - will cite you a few cases. I was called out to the house of a woman with angina. She was propped up in the bed and talked between breaths. Whether or not the case was complicated by an infection, I do not know. Anyhow, I got her to take some kelp and she did not die, but got well.

Another case. My own step-father, seventy-six years of age, had mild angina and overcame it. Now he is sold on the use of kelp, in fact is quite enthusiastic about it. I give patients with angina 5-grain tablets of kelp. In the town where I live there have been thirty cases that I know of that have recovered by this treatment. The kelp we use comes from California and grows in the sea. Seaweed that grows in lakes is valueless, but any ocean kelp contains the sea minerals. The difference in value varies with the difference in the grade of kelp. Human beings all over the world have been using this for centuries. The Japanese and Chinese use it to make many dishes. Dr. Weston Price found many primitive people using it, and in the Andes mountains, found that the natives carried little pouches about their waists containing kelp and fish eggs.

Erosion of the teeth seems to result from a lesser degree of inadequacy than that which produces dental decay. Same in principle, however, as it is due to two factors - systemic and local. Systemic, in that lack of calcium-phosphorus balance leads to insufficient minerals in the saliva. The saliva gets its materials from the blood, and if the blood is lacking in the constituents of a normal saliva, it is an unavoidable result that the saliva will not have adequate buffer action to protect the teeth from erosion. And that to my notion is how it works. In dental decay we have not only the nutrition of the saliva to consider, but that of the dentine as well; both are solely dependent upon systemic causes.

We have two types of arthritis. 1) The acute type which is typical of the sympathetic dominants and has a high phosphorus level, and 2) the chronic, which is typical of the parasympathetic dominants and has a high calcium level. Since this disease in its two manifestations gives an excellent example of calcium-phosphorus metabolism reflecting the dysfunction of both sides of the autonomic system, we will discuss it in detail.

In my opinion, arthritis is a single disease of disturbed metabolism, which may be acute or chronic or a mixture of these conditions. It may be defined as a disease of calcium-phosphorus metabolism due to faulty body chemistry.

The onset of the disease is usually marked by pain and tenderness of the part affected. It may or may not be accompanied by swelling. In this stage the calcium level of the blood is low and the phosphorus level is high. If body structures are affected, there is a withdrawal of calcium, and if this stage lasts long enough, a dissolving process is evidenced by means of the X-ray. This stage or type of arthritis is therefore called the

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"dissolving stage." Movement of the part or parts affected elicits increased pain and increases the inflammatory process. For this reason rest is essential for the parts affected.

The initial process is usually not of long duration. The inflamation usually subsides and the patient may not have another attack for years and possibly forever. The chances are, however, that unless the cause is eliminated the attacks will recur with ever-increasing frequenoy. The periods between acute attacks at first are symptomless, except for slight pain with unusual movement, or a slight, scarcely noticeable stiffness. But with increased frequency of acute attacks the discomfort of the in-between periods is more marked. At these times the calcium levels will be high and the phosphorus levels low. There is a tendency for the uncombined calcium to deposit in the etched areas resulting from the previous acute stage. This I call the depositing stage.

The dissolving or acute stage may in a small proportion of cases persist for long periods of time with very little of the depositing stage, or the depositing stage may persist with no history of the acute stage. I have seen both types of cases in two sisters. Both were cripples whose time was spent either in bed or in wheel-chairs. One had the dissolving type of arthritis, or what might be called the prolonged acute stage, to the degree that the bones of the fingers and toes had completely disappeared. The other sister had the depositing form of arthritis or arthritis deformans. Her hands and feet were gnarled and club-like. Most of her joints were permanently ankylosed. This sister later had her leg amputated because of gangrene. The arteries had become occluded with calcium to the degree that it was practically a bloodless operation. Both cases resulted from disturbed body chemistry.

The usual case of arthritis is characterized by alternating high and low levels of phosphorus in which the acute or dissolving stage rarely lasts more than six weeks, and the chronic or depositing stage is the usual stage in which the individual lives.

Although faulty body-chemistry is the cause of arthritis, there are a number of causes of faulty body chemistry. Hence, treatment to cure the diseases depends upon recognition of the factor or factors responsible. Mental conditions may so affect the body chemistry that there is a wide fluctuation of calcium-phosphorus levels. During the depression many business men developed aches and pains from worry which later disappeared with the return of more normal business conditions.

Mechanical conditions can produce defective chemistry of a part by interference with normal circulation, as witness Pemberton's experiment of tying off part of the blood supply in a a dog's leg, resulting in arthritic deposits. Arthritis in the shoulder may come from a sleeping posture producing interference with circulation.

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Infection may affect the body chemistry. When infection is the cause, its removal usually clears up the arthritis. Infection, however, is but one factor which may affect body chemistry. The greatest mistake in the treatment of arthritis has been the supposition that there must always be infection at the root of the disease. Thousands of mouths have been wrecked by the needless extraction of teeth, to say nothing of the removal of tonsils, gall bladders, appendices, and whatnot, sacrificed in vain. Even these measures have generally given some temporary relief in chronic forms of arthritis, for the healing process following the operation serves to raise the phosphorus level, often sufficiently so that the patient feels sure for awhile that at last the cause of his trouble has been found and removed. Disillusionment comes later. I believe that this phenomenon of apparent relief after any operation has been the foundation for the belief of so many of the profession that arthritis was due to infection.

The cause may be in the diet; not in meats that are red, as once was thought, but in an inadequate diet, a diet deficient in one or more of the essentials needed by the body. The author has found that the diets of arthritics are usually preponderately carbohydrate and deficient in the trace minerals. Usually a deficiency of the Vitamins B is found if the diet consists in any part of refined carbohydrates, for even a good diet is not apt to have too much of the Vitamins B for optimal health.

In a series of several hundred arthritics nearly all consumed large quantities of sugar. Sugar disturbs calcium-phosphorus balance more than any other single factor. It disturbs it in the direction of higher calcium and lower phosphorus. When the effect of the sugar is worn off, there is a rebound in the opposite direction, for action equals reaction.

Nutritional treatment therefore consists of a diet which contains all of the essential which the body needs, and which does not contain substances which the body is unequipped to handle efficiently. The latter things are principally white flour, sugar, and alcohol. The modified diabetic diet is the ideal diet for the arthritic as well as for nearly everyone else. It is the biologic diet.

Menopausal arthritis is due to disturbed glandular function which is but increased at the time of menopause. The disturbance in body chemistry may not have been severe enough prior to the time of menopause to create any distressing symptoms. It might be noted at this time that menopause is but a normal process in people whose body chemistry is normal; but if the body chemistry is abnormal, the period of menopause then becomes a time of physical and mental stress. The treatment of arthritis of this origin is chiefly endocrine. The female sex hormone is used principally, though insulin is of great value used at the proper times.

Symptomatic treatment for the immediate relief of pain consists of the use of endocrine products temporarily and preferably,

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for I believe that we can best follow the rules of nature and use those products that nature uses to maintain equilibrium of body chemistry. Nature makes its own regulators for body chemistry. A little augmentation of the body's own endocrine products often serves the body well, and in a way most acceptible to the body.

Sugar raises the calcium level and lowers the phosphorus level. Molasses or honey will do the same, and since molasses and honey contain valuable food ingredients in addition to sugar, they may well be used. A tablespoonful or more at each meal to relieve the pain in acute arthritis is of benefit, for if the phosphorus level is dropped to forty per cent of the calcium level, the inflammation and swelling will immediately disappear.

Three unit injections of insulin repeated as often as may be necessary can be used in conjunction with the molasses or honey, for in the acute stage of arthritis the patient is sympathetic dominant. There are some rare cases that require thyroid to reduce the phosphorus levels or anterior pituitary. They are very infrequent.

The response to insulin and molasses therapy in these acute cases is often spectacular, but these measures must be stopped as soon as the acute stage subsides. After the acute stage is over the treatment is largely nutritional. This may be augmented by endocrine therapy. If such is the case, an extract from an endocrine gland or glands dominated by the opposite side of the autonomic system from that of the endocrine product used to treat the acute condition is used. If for instance, insulin were used for the acute condition, small amounts of thyroid (1/10 gr.) daily might be used for the chronic condition. The blood should be checked at frequent intervals to keep track of the proportion of phosphorus to calcium. Thyroid is cumulative in action and the phosphorus level may rise past the 40 per cent mark and cause a return of the acute symptoms.

The object of nutritional treatment is to correct endocrine function, for endocrine substitution or augmentation is at best a crude method of furnishing the desired hormones, because it is impossible to supply the products at the natural rate of glandular secretion or to know exactly just what secretions need augmentation. It is difficult to judge how much substance should be given even with the calcium-phosphorus levels as a guide. Without them it is pure guess work.

We may illustrate with an actual case of arthritis. A woman, fifty-two years of age; five feet, five inches in height; weight, 124 pounds; brown hair, blue eyes; a grandmother who had arthritis of the feet. She was of English-Irish ancestry on her father's side and Holland-French on her mother's side. She was the typical American of long-headed Nordic ancestry and was living in Detroit. Her parents before her had lived in Wisconsin and Michigan. Her measurements showed that she had been a parasympathetic dominant during her growing age. This type of measurement in a woman of her

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age means only that the environment of her youth was unsuitable for proper development. It does not mean necessarily that her present environment is unsuitable, although if it were approximately the same as formerly, it could very well be still unsuitable.

Her diet was just about typical of the American diet of people of her station in life. She ate meat, eggs, fish, (mostly fresh water) two slices of whole wheat bread daily, (no more because she was guarding her figure). She had cereal of some kind at breakfast, ate all kinds of vegetables, both raw and cooked, as well as orange or tomato juice at least once a day. She drank six cups of coffee daily, in each one she used one teaspoonful of sugar. That with one teaspoonful for her cereal made seven per day. Besides this she ate candy, pie, cake, cookies, and canned fruit. All of these contain refined sugar. She had begun to lose her pep in the last few years so had become accustomed to taking two coctails and a highball each day. She smoked about fifteen cigarettes daily. The blood pressure was 164-95 while the blood analysis for calcium and phosphorus was perfect, being ten of calcium and four of phosphorus, all of which indicated sympathetic dominance at that time.

Upon elimination of sugar and alcohol from her diet, the next test made in a week's time indicated her true state of body chemistry. It was 9.3 of Ca. to 4 of P. The ratio of phosphorus to calcium continued to increase until the test in two months time showed 8.3 of Ca. to 4 of P. After two months of biologic diet, the calcium level began to rise, and in three months the calcium and phosphorus were once more in balance. Her arthritis had begun to disappear even before balance was attained. She was particularly pleased to tell me that she had danced all evening at a party, something that she hadn't been able to do for some time.

This case is particularly interesting because it not only shows a case of the successful treatment of arthritis, but also shows how behavior often reflects the state of the body chemistry. She had used alcoholic drinks regularly only for the last two years. She explained that she felt better when taking them and decided that since she was a grandmother and her family all grown, she had a right now to do as she pleased if it made her more comfortable.

Some might ask, why not use sugar to maintain better equilibrium of calcium and phosphorus levels in sympathetic dominants? First of all it cannot be done effectively without taking just the right amount at frequent intervals, and secondly, the method increases the deficiency already existing; adding fuel to the fire so to speak. Sugar is a drug and at times can be used for the purpose of raising the calcium level and lowering the phosphorus level. But its use should be for temporary effect only.

It is interesting to note that after this woman's body chemistry became more efficient, she ceased to feel the need of six cups of coffee and the alcoholic drinks daily. She also ceased to be a chain smoker. Her nerves became less jittery.

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This case also illustrates the fallacy of using one blood test or any one factor in diagnosis, as the complete diagnosis of a case is dependent on recognition of all the signs. Exterience with arthritic cases teaches us especially that ovory known fact must be evaluated. Every case is a case unto itself. This makes the work more interesting.

To summarize the autonomic system. We find that the endocrines on the slow-down or parasympathetic side control the assimilation of calcium, and when there is dysfunction, as evidenced in a low calcium and a high phosphorus, there is susceptibility to the infectious diseases. Treatment consists of endocrine supplementation with insulin and/or posterior pituitary extract and nutritional correction. We find that the endocrines on the speed-up or sympathetic dominant side control the assimilation of phosphorus, and when there is dysfunction here, as evidenced in a low phosphorus and a high calcium level, there is susceptibility to the depositing diseases. Treatment consists of endocrine supplementation with thyroid and/or anterior pituitary extract and nutritional correction. Both in diagnosis and as a check on the effectiveness of treatment, the calcium-phosphorus tests are found to be of value.

* * * * * * * * *

BODY MEASUREMENTS, ETC.

The practice of medicine today is based on the theory that all men are alike. The theory of the chemist is that all men are different. Enormous progress has been made with infectious diseases, yet the degenerative diseases are increasing -- figures show that they are increasing faster as time goes on. Apparently the old approach to medicine cannot be effective in this field, but the biochemical approach to medicine can prevent these diseases.

We all know as dentists that dental decay, a degenerative disease, afflicts almost everybody. Susceptibility to this means susceptibility to other degenerative diseases and we need the same amount of history for diagnosis and treatment of one as the other. So in this chart we want to get the name, address, date, who referred, age, weight, height, color of eyes, children or not, where they live, have lived, when, and how long. All this is very importnat because it gives us an idea of nutritional deficiencies. Where father born, mother, what ancestry, shape of head, whether round, medium, long, or whether teeth are good. Inquire about dental work, whether little or none, color of gums, red, normal, or pale. Underline approximately what they eat. In this food list we have milk, eggs, meat, fish, kelp, white bread, cereals, type, whether candy, cake, pie, cookies, sugar, how many teaspoonsfuls -- everything they eat. List of condiments, nuts, pickles. Are they taking any vitamins or other preparations? Wine, beer, liquor, and soft drinks? Something about configuration of that individual -

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legs - large or thin, etc. All means quite a little bit in the diagnosis. Inquire about allergies - sensitivity to foods.

Then we have a list of symptoms, chiefly - left side of chart - are symptoms of the parasympathetic - other sympathetic. This affords a means of partial diagnosis.

Parasympathetic	Dominant	Sympathetic
low	temperature	high
low systolic	blood pressure	high diostolic
moist	skin	dry
dilated	veins	constricted
bradycardia	heart	tachycardis
asthmatic attacks	lungs	
urticaria		
mucous colitis		
frequency	winking	infrequency
increased	hydrochloric	decreased
contracted	pupil	dilated
belching		
intestinal flatus		
absent	gag reflex	great
absent	ulcer-like distress	present
marked	fearfulness	absent
slow	excitability	marked
intermittent	activity	steady
easily fatigued		
introverted	interest	extroverted
timid	self-confidence	over-confident
suggestible	suggestibility	ignores
over precise	preciseness	careless
suspicious		
bold	attitude opposite sex	antagonistic
antagonistic	attitude same sex	friendly
dull	math. ability	quick
clammy hands and feet		warm and dry
dermatographism		none
silent		voluble
likes warm weather	preference weather	cold
pale	mucous membrane	red
constipation		

In the examination of the individual it is necessary that the list indicated be noted. It is very essential to see everything. We cannot afford to overlook the most irrelevant thing, chiefly because people who come to us with abnormalities are quite likely to have an abnormal endocrine setup. All of these abnormalities help us to decide what that endocrine setup is. The shape of the head is important because it tells us something of the start, the nutritional adaptations of his ancestors. These differ with different types of people. The color of the eyes is very important and gives us an indication of his racial background. Blue eyes are

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from the north of Europe where the summers are short, winters, long. Chief diet is seafood. Brown eyes, round head, need a heavier protein diet - does not require as much of tho minerals as the blue eyes because ancestors did not have as many and became adapted physically to doing without them. This adaptation, however, took hundreds of years. The body changes slowly, very slowly, and it is that which we have failed to take into consideration as we have changed our dietary habits. Red muocus membrane is sympathetic dominant. May not be his ordinary status, but at this time he is sympathetic dominant. Pale mucous membrane is parasympathetic dominant. I wish dentists would learn this - they could pick out base material to match. Is there hair on the legs? This is quite important, for it indicates something of the status of the adrenals. A hairy person has strong adrenal glands, acts quickly in emergencies. Without hair, they sink and go to pieces. Has he a weak thyroid, adrenals, or anterior pituitary? If you can determine this, you are helping in diagnosis. If hairy, adrenals are all right. Ancestry is important because we want to know what the probable response to treatment will be. If Scotch, means that any endocrine disability is likely to be quite fixed because the Scotch have lived under adverse conditions for a good many years. When you try to treat Scotts as endocrine subjects, you usually have a slow response. Takes a long time for nutrition to correct endocrine deficiencies in these people. Body measurements are important. Note the distribution of fat in the upper part of the body in proportion to the lower. Sympathetic dominants are generally heavy above the waist, and parasympathetics, below the waist. This helps us a great deal in determining endocrine disability. For instance, we will measure some women that are here to find out about the amount of dental decay which they have. I should be able to determine by measurements how much they will have. Disproportion of body measurements is proportional to abnormality of body chemistry. If dental decay is also proportional, body measurements should indicate the degree of dental decay and dental decay would be proven to be of systemic origin.

We want to know about the medical history of this individual, of his metabolism in the past. His calcium-phosphorus levels at the present and by continuing the calcium-phosphorus tests we will see the effects of treatment. The first test is influenced by sugar and does not count. It shows where he started and offers an explanation for some of the things that may have happened to him. A second test at the end of a week will indicate the true state of the body chemistry if sugar has really been excluded from the diet. Look at his fingernails - at the lumen on the nails - indicates endocrine dysfunction if it is lacking. The less lumen there is, the more fixed the endocrine dysfunction. Unless we want immediate results, we do very well without endocrine treatment - just nutritional. The temperature is very important as a means of diagnosis. By that we mean just fine shades of temperature. Use a good thermometer and leave it in the mouth for al least two minutes. All of these things help to indicate whether the patient is sympathetic dominant or parasympathetic dominant. Remember that the sympathetic symptoms are of the speed-up type and the parasympathetic, of

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the slow-down type. Therefore, the sympathetic dominant would have a plus temperature and higher than ordinary blood pressure and the parasympathetic would be sub-normal in these things.

To illustrate body measurements and the importance of other symptoms in diagnosis, I will examine this woman as if she were a regular patient. What foods do you use habitually - meat, eggs, fish, whole wheat bread? One slice a day. No cereals, no candy or cake? No coffee or tea - no sugar-cooked vegetables, raw vegetables, raw fruits, cheese, yeast-B. No viosterol, seldom drinks - no soft drinks - no allergies - has had glandular disturbance over a long period of time - swelling in parathyroid gland - severe sinus infection - trouble with nutritional deficiency in the past. Started out with poor history - had a couple of operations - one a caesarian from which she did not heal very well. Mucous membrane is about normal in color - had endocarditis - blood pressure is 122 - pulse, 42. Sometimes has pep - other times has none - variable - sometimes sympathetic - sometimes, parasympathetic.

We measure the patient. From the wrist bone to point of elbow 9 1/2 inches. This figure we divide by 4, gives us 2 3/8. Then measuring around the arm 2 3/8 inches above wrist joint and each the same measurement above. Same way we measure from ankle bone to knee. 16 inches and divide by 4 gives us 4-inch intervals. Add all these quotients and divide by 5 to get average. Each dot represents a person who has been plotted on this chart, both as to measurements and to cavities.

CHART
Caries average per year

0 1 2 3 4 5 6 7 8 9

Chart shows that dental decays all fall into the same place on the chart. When we check dental decays with blood test and measure the endocrine history of the individual, it indicates that Mrs.___ has been a sympathetic dominant. This accounts for much of the trouble that she has been through. We could determine by means of a blood test what she is now. It is possible that she has changed from a sympathetic to a parasympathetic dominant. Ninety-five per cent of the patients whom I have examined were parasympathetics and I used thyroid. Ninety-five per cent of decay is due to high calcium and low phosphorus which is typical of parasympathetics. But ninety-five per cent of the people in hospitals are sympathetic dominants.

This measurement test only works accurately on women, young women. The reason being that it indicates the type of metabolism through which they have passed. The metabolism may change over periods of time - may be sympathetic dominant for ten or fifteen years and then change to a parasympathetic. When we get older women and try the measurements, we do not discount the measurements because it gives us a picture of what she has been and indicates the degree of autonomic dysfunction. Exercise does not

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interfere with the measurements. They are chiefly determined by subcutaneous tissues and fat. These measurements work on everyone. I have yet to find where there were any exceptions to the rule, and should one turn up, we would find the reason in the diet history. The normal measurements for men will be in different proportions than the normal for women. Whereas 1.410 is correct for women, probably 1,310 is correct for men. I have not tested as many men as women and so am not completely sure about that. We can change body chemistry in young people through nutritional changes. These measurements indicate very accurately the type of body chemistry, because the endocrines through the control of assimilation determines growth. Where there is dysfunction of the endocrines you will find it registered in growth proportions. Growth is the result of the mechanical efficiency or inefficiency of the organism as a whole.

At the present day many of our most beautiful actresses have a heck of a time trying to keep down fat, but they are bucking nature, for this disproportion is due to metabolism. If these women who mean so much to everybody in the nation had the proper nutrition, they need not lose their bodily proportions - their teeth structure - the shape of their mouths. We raise beautiful women only by accident, and this could be done intentionally. If every woman grew up to have all that nature intended them to have, we would not have anything but beautiful women with good dispositions, beautiful teeth, and the well-shaped bodies that nature intended them to have. Beauty of figure means also perfect health - the two are symonymous.

The shape of the leg indicates the type of endocrine functions to a certain degree. Different types of legs in different parts of the country are due in part to the type of soil that that part of the country has. Through the southern states there is a streak of red clay that contains iron - runs into northwest Florida - extends about fifteen or twenty miles. In the red clay districts the people looked entirely different from the people around the great lakes - goiter belt. A certain proportion of the women in Pennsylvania have piano legs - wear over-sized stockings - one size dress above the waist and another in measurements below the waist. In short the different soils effect the foods grown in a given locality, and they in turn effect the endocrines and thereby the growth of the inhabitants.

In the West people are particularly subject to angina and coronary thrombosis - fifty per cent of the best men die from coronary thrombosis - thyroids are over-active and at about the age of menopause they topple over. In the case of a good sympathetic dominant you can give them that expectancy. The parasympathetic will live a long time. The sympathetic gets the best of the bargain and enjoys life. The parasympathetic has a millstone around his neck - lacks that something that the sympathetic dominant has. The sympathetic dominant is very keen, quick to get things, but still he would be more efficient if he were normal. The greater the degree of symoathetic dominance the more erratic they become. The

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parasympathetic is very apt to have prematurely gray hair or loss of hair in spots according to hereditary tendency. Some of the sympathetic dominants on the other hand retain the color of the hair until the sixties and maybe into their seventies. There are, however, great variations. There is very little chance that there is an absolutely typical sympathetic or parasympathetic dominant here.

Legs that are thick just above the ankle are indicative that the patient has at some time been a parasympathetic dominant at some time during the period of growth. A very trim leg - thin ankle and shapely leg but large in proportion to the arm usually indicates anterior pituitary dysfunction. The women with sub-functional thyroids with large thick ankles are very apt to have small breasts, but the hypo-anterior pituitary may have large breasts - when young - to the delight of the male, but when older - are not so good. Some, although measurements show they are way out of order, either as parasympathetics or as sympathetic dominants, have no caries. I have named them pathologically immune as determined by calcium-phosphorus tests of the blood.

(EXPERIMENT) Miss Helen Blank

Legs bulged slightly on the side just above the ankle.

Measurements:							
arm	9 inches long	7.25	7.5	8.0	8.25		
leg	15 " "	8.75	11.1	11.7	11.4		

Blue-eyed blond - parents raised in South Dakota, grandparents also. German-French ancestry - came from northern Germany. 1.590 ratio. Means around nine cavities a year. Does not have that many cavities, but has cut down on sugar. This type of metabolism is serious. This girl is parasympathetic and something could be done for her by way of prevention of future trouble through improved nutrition, etc.

(EXPERIMENT) Miss Eleanor Blank

Legs also bulged at same spot - probably both a pituitary and thyroid case - shows that some time she has probably been a parasympathetic.

Measurements:							
arm	9 inches long	6.1	7.4	9.1	10.25	10.25	
leg	18 " "	9.5	9.9	13.04	13.06	14.00	

No cavities in twenty-years. She takes two or three teaspoons of sugar a day, but no desserts. She has very good metabolism. No indications of any abnormality. Her metabolism is very close to normal - may be normal right now. Quite a lot of dental work at some time in her life, probably during that period of time when the disproportions that exist now were developing. Her metabolism has improved since that time. That very slight disproportion may have taken place when she was in her teens. It is unusual to find one so close to normal.

One girl I knew had the homeliest legs I ever saw - a dancing

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teacher. I asked if she would come up so I could measure her legs. She came up and I explained to her what I was trying to do. She told me that those legs had been the greatest grief of her life. The only way she could keep them in any shape at all was exercise - the fat would collect - still she didn't have a figure that was good because of her metabolism - should be treated from a systemic angle.

Case of sympathetic dominance. Sixty-five years of age. At five years of age had brain fever - has had a fear of death - mother died of angina - father died when she was seventeen. She had a complete breakdown at twenty-one - unlcers at twenty-nine - menopause at fifty-four - goiter, bad health, gall stones, operation at sixty - increased nervousness - operation for ulcers - fear of cancer. Had had, you see, practically all the diseases on the sympathetic side except cancer. At time she first came to me her blood pressure was high, her temperature was on the plus side, and had had angina and colitis. Her response to nutritional correction and endocrine supplementation was very quick. She now has an improved blood pressure, less pain and angina, and is able to eat things which she has been unable to handle for some years. Her mental outlook has improved and she is more cheerful and has a more courageous outlook on life. Treatment: 3 units insulin daily and nutritional correction.

Body measurement tests give information on metabolism to supplement the calcium-phosphorus test. Information as to heredity and nutrition aid in providing further clues to diagnosis and a key to the speed of response to treatment which may be expected. Symptoms may be classified as indicative of sympathetic or parasympathetic dysfunction. Because of the variations of endocrine patterns which are possible, all signs must be heeded in this work. There are things such as minute differences in temperature which are of no value to the medical world in their present attack upon the infectious diseases, but which have great significance for the bio-chemist in his attack upon the degenerative diseases.

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NUTRITION

There are two laws of nutrition. 1) Eat everything that is necessary and in the proper quantities. 2) Do not eat those things which are harmful. Let us consider the first rule. We eat food for three purposes: 1) for energy 2) for heat, and 3) for the rebuilding of worn tissues. We can measure food in terms of calories and approximate the heat and energy value of our intake, but it is possible to provide an adequate number of calories and still have the diet deficient in building materials. And, in my opinion, if we lay chief emphasis on fulfilling the requirements for building tissues, etc., we should have no need to concern ourselves with the relative amounts of calories oonsumed. So assuming that you are all aware of our need for carbohydrates, proteins,

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and fats, I shall lay chief emphasis on the vitamins and minerals. But I cannot over-emphasize the fact that no one thing is more important than another. Each element has its place in our diet and is a necessary supplementation to the other elements.

Now as to vitamins. Great publicity has been given to vitamins of recent years. New vitamins are found, divided, and subdivided yearly. The public has become extremely "vitamin conscious." Remarkable results have been obtained by the use of certain vitamins, nicotinic acid for example has proven of inestimable value in the treatment of pellagra. Our diet has been found especially deficient in the Vitamin B complex. And for this reason I have many patients using this in the natural form of yeast tablets.

When it comes to a chemical analysis of vitamins, we find that they, as well as carbohydrates, proteins, and fats, are chiefly made up of carbon, hydrogen, and oxygen; three elements so common that they can be found everywhere. Any plant can get them from the air, water, or sunshine. However, there are a few vitamins containing nitrogen, phosphorus, and sulphur. These things are very common and are usually found in the soil in adequate amounts. The natural and obvious deduction from this analysis is that vitamins, carbohydrates, proteins, and fats are as plentiful as our needs require if we do not destroy them through our methods of food preparation.

While certain vitamin losses during cooking are unavoidable, considerable quantities of these valuable protective substances are needlessly thrown away. Under certain conditions the oxygen of the air changes vitamins into other substances. This process of oxidation is accelerated by heat. Thus, stirring air into foods while they are cooking or serving them, while they are hot, is a frequent cause of vitamin destruction. An alkaline substance such as soda, frequently used to preserve green color in vegetables, also intensifies oxidation which has a destructive effect upon all of the vitamins. Acid, on the other hand, either when added or when naturally occuring, as in tomatoes and many fruits, helps to protect the vitamins in food during cooking.

In the case of ascorbic acid, oxidation is accelerated by an enzyme referred to as ascorbic acid oxidase, and also by certain metals such as copper. The enzyme is inactivated by heat. Thus, for the conservation of ascorbic acid, it is desirable to employ a method of cooking that rapidly raises the temperature of the food to the boiling point. It was found, for example, that about one-fourth of the ascorbic acid of cabbage was destroyed before boiling and very little after the boiling point was reached, although a considerable quantity was dissolved in the cooking water.

Ascorbic acid, thiamin, riboflavin, and nicotinic acid all dissolve readily in water, therefore, the water in which foods are cooked may acquire quantities of these vitamins. The more water used, the greater will be the amounts of vitamins dissolved. It is recommended that the water drained from cooked vegetables be

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served as gravies, sauces, or soups. The insolubility of Vitamins A, D, and E prevents their loss in this way.

Either steaming or the so-called waterless method of cooking dissolves out less of the vitamins than boiling; on the other hand, the more rapid process of boiling helps somewhat to prevent ascorbic acid destruction. These methods of cooking appear to have no significant destructive effect on the vitamins other than ascorbic acid and to a lesser extent, thiamin. Long cooking processes such as stewing permit greater vitamin losses. Frying is probably the most destructive of the ordinary cooking methods and may result in a complete loss of Vitamin C, considerable loss of thiamin, and significant loss of Vitamin A.

Freezing of foods apparently has little effect upon the vitamin content of foods while the effect of drying results in loss of Vitamins A and C to some extent and almost total loss of thiamin. Meager evidence suggests no appreciable loss of Vitamins D and E and nicotinic acid in foods due to drying.

Most vitamin losses in canning are due to oxidation. Consequently the aim in canning methods devised to preserve vitamin content should be to exclude air from the hot food just as much as possible. The so-called open-kettle method of canning with subsequent transfer of the hot food to containers permits greater vitamin destruction than methods in which the foods are processed directly in the jars. Removing the air from the jars before processing helps to keep down the vitamin losses by oxidation. It also minimizes the loss of vitamins during storage of the canned material.

As in cooking, acid foods retain more of their vitamin content during canning than non acid ones. After canning, citrus fruits and tomatoes for example, are still excellent sources of ascorbic acid, even though this is the most easily destroyed of the vitamins.

Numerous mineral elements other than calcium and phosphorus are required by the body. Some of them including sodium, potassium, and magnesium occur in fairly large quantities. Our foods fortunately also contain large quantities of these minerals and nutritionists are of the belief that no deficiencies are likely to exist in the dietary of the population of the U.S. in this respect.

There are many other minerals, however, which are essential to adequate nutrition which have an importance much greater than their bulk would indicate. Some of them are needed in very minute amounts, so minute that they are designated as "trace" minerals. Only about a dozen of these trace minerals are known to be essential, but it is suspected by some nutritionists that eventually all the minerals ordinarily found in the earth's crust will be found to play some part in the mechanism of the body.

The first great distinction in the nutritional requirements of living matter is in the use of inorganic elements by plant life,

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and the use of organic material in animal life. Even in this respect there is no sharp line of demarcation. Certain plants like the fly-catcher have the ability to use organic matter, and to a slight degree animal organisms have the ability to use certain inorganic material such as common salt or sodium chloride, and even to a certain degree the salts of other minerals. In general, however, the chief distinction between animal and plant life is the ability of the plant to use the inorganic and the inability of the animal to do so.

Climatic and soil conditions differ in different parts of the world and eventually through the law of survival of the fittest, one plant developed to meet a certain set of environmental conditions, while another developed to meet another set of environmental conditions. Eventually these characteristics became so fixed that any great change in environment proved disastrous. Certain varieties of the cactus plant became adapted to the desert, and under conditions suitable for most plants they do not thrive so well. Certain trees will grow in warm, moist climates, but will perish in colder climates, and vice versa.

Even among plants of the same species great differences in desirable environmental conditions occur. Corn adapted to Mexico doesn't do so well in Minnesota, etc.

Likewise the same rules of development apply to animal life. One type requires plant material exclusively; another type requires a mixed diet; still another lives on products of the land; another, on products of the sea.

Many thousands of generations are required to change adaptability to new environmental conditions. Fortunately, in nature, climatic and other environmental conditions change rather slowly so that the step over one or a few generations is slight. Otherwise the ability of the organism to change would be outpaced.

Even this change of nature has in the past in many instances been too rapid for all organisms to change with it. We find today evidences of organisms which have become extinct through this inability on their part to change fast enough to keep up.

In regard to mankind we tend to lose sight of the fact that man is also an animal; a living organism, and just as subject to the rules of nature as any other living organism. We like to think that we are different. However, it is not in our bodies that we are different. We still have animal bodies which are just as subject to the laws of nature as the bodies of dogs, birds, and cattle. Men as well as animals have to adapt themselves to the conditions pertaining in the regions in which they live. Some of these regions have conditions more favorable for development than others, and as a result, size and height of people vary.

The sea is the soil of the foods grown in the sea, just as the ground is the soil of land-grown foods. But, whereas the soil

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of the sea is relatively constant in quantity of minerals, the soil of the land varies to a great extent. As a result, sea food has a stable content of the minerals, while foods grown upon land have a different and varying mineral content.

Not only do land soils differ in their origin which would make for different mineral content, but they also differ in their age and exposure to the leeching effects of rainfall.

It is well-known that in mountainous regions and in certain other regions of the earth an almost total deficiency of iodine exists. This is chiefly because the salts of iodine are relatively soluble and through the centuries the most soluble salts have been washed into the sea. Certain peoples of the earth have learned to live in these regions. Their bodies have learned to do with a minimum of these soluble minerals. Curiously enough, these inland-living people have round heads, while the coastal peoples everywhere have long heads. This is a great help in diagnosis of the needs of individuals, for we must first know the essential needs of the patient before we can supply them. If the habitations of different peoples were confined to the regions indigenous to those peoples, the problem of supplying suitable foods would be simplified, but when we find people of so widely different ancestry, as in the new world, it is essential to know the differences in requirement of those people. Wherever there is iodine in the soil there will be iodine in the rivers running from that region. The plants growing in the soil will have their content of iodine and the people and animals eating the plants will have their share of iodine. It is a strange commentary on the reasoning of some of our health officials that to supply an iodine deficiency, they would put iodine in the drinking water. In the outlet instead of in the inlet, so to speak, and where plants which might change the inorganic iodine to the organic, have no chance to do so. If the State would instead require an iodine content in fertilizers, the people would be far more effectively served. An even more direct and inexpensive method would be the eating of iodine containing foods such as seaweed, as do the Japanese and many other peoples of the earth.

Minerals and vitamins are well understood to be essential in nutrition, but there is no exact knowledge as to the functions they perform. However, there is evidence that they are essential to glandular function, perhaps as essential constituents of glandular secretions, or perhaps as catalysts essential to the manufacture of these secretions by the glands, but probably they act in both capacities.

Iodine is known to be an ingredient of thyroxin, the secretion of the thyroid, and while zinc is essential in the manufacture of insulin, no zinc is present in the completed product. So here we have examples of an ingredient and a catalyst. A further indication of the use of vitamins and trace minerals by the glandular organs in that analysis show that these organs are plentifully supplied by both while the rest of the body is found to contain

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but little. When the trace minerals are deficient in the foods of those people who especially need them, the effect is apparently upon the endocrines, for the body chemistry is altered. One of the most important functions of the trace minerals is their influence upon calcium and phosphorus metabolism. Without them the endocrines and the autonomic system lose balance and with this goes loss of calcium-phosphorus balance.

I will reiterate once more the relationship between the autonomic system, the endocrines, and the diet. The calcium-phosphorus test indicates the balance or lack of balance in the autonomic system, for where either side of the autonomic system, composed of opposing endocrines is not functioning normally, it shows disturbance through the improper assimilation of either calcium or phosphorus. And since it is the endocrines which control the assimilation, it is necessary that they have the proper building materials provided through the diet in order that normal function may be attained and maintained. In short, good nutrition means balanced body chemistry and good health. Poor nutrition results in poor health. Fortunately now, thanks to the calcium-phosphorus test, lack of chemical balance in the body can be determined before it has become sufficiently deep-seated to create outward symptoms of disease. Outward symptoms of disease may not become evident for years, but the body chemistry has been out of order all the time. However, the calcium-phosphorus levels will show lack of balance immediately that there is dysfunction of the glands or that injurious substances have been admitted to the diet. The intake of refined sugar will register almost at once in a changed calcium-phosphorus level. The effect of refined sugar on these levels will be more fully discussed later.

As people's endocrine patterns differ, so do their diets. The Nordics come from a cold coastal climate where the implements for agriculture were few. Through hundreds of generations their body mechanism became adapted to a heavy fish diet containing many minerals. Their descendants whose endocrine pattern is determined by the diet of their predecessors have special physical characteristics - long heads and blue eyes. Wherever you find this physical type, a high mineral content is required in their diet.

The central Europeans were inland people subsisting mostly on animal foods and grains. Undoubtedly they had ample minerals and vitamins because they ate the vital parts of the animals and did not refine the grains previous to use. However, their mineral needs and those of their descendants are not so great as those of the North.

The Mediterranean peoples lived on a heavy carbohydrate diet with fruits and vegetables and some sea foods. Of course, through much inter-marriage there is a great variation in endocrine pattern, a great mixture of racial stock, but just as certain physical characteristics are unmistakable, so certain dietary requirements of that physical type are definite.

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Adaptation of the human organism is as slow a process as that of a plant. A cactus is adapted to a dry climete, but not so a violet. It would take just as long to reverse the needs of these two as it did to establish them. But modern civilization is setting up a speed record on rapid change. Unfortunately, the animal mechanism is incapable of reversing and about facing to the ringing of a bell. Its needs are predetermined and its adaptability is slow.

We have increased the quantity of food which can be produced on a given bit of land, but we have decreased the food value of the produce by not putting back into the soil what we take out. Every year this country permits tons of vital minerals to pour into the sea when we should be holding it in the land. Transportation facilities are greatly improved. We can secure that food which our pampered tastes dictate. Coastal people are living inland and vice versa. But the necessity of transporting and storing foods at centers of concentrated population has led to the refining and devitalizing of many of our foods.

White flour keeps very well. Those things which the bacteria like and which propagate healthy bacteria have been removed. However, what is good food for one animal organism is often as good for another. Now that flour has not much appeal for bacteria and rodents it has less food value for us. White flour, etc., is devitalized for commercial reasons. In itself it is not harmful, but in taking up the space needed for more nutritious foods it causes harm by displacement.

The rodents and other animals are still guided by their instinct in their selection of food. We should be also. We should revive our sense of sour, sweet, bitter, and salt. In a state of nature bitter things are generally poisonous - that is a protective sense of taste. The salt taste was not originally just for sodium chloride (our table salt), but for a combination of a dozen or so salts which our bodies need. The taste for sour and sweet leads in a state of nature to things which are not purely sweet and sour, but are accompanied by other valuable food elements such as minerals and vitamins. However, our refined sugar simply satisfies the taste for sweet, but not the bodily needs. Seventy per cent of the food we eat is broken down into sugar. . Sugar is one of the things which is capable of permeating the intestianl walls and entering the blood stream. We oannot have more than one teaspoonful of sugar in our entire blood stream at one time or less than one-half teaspoonful, or death will soon result. But when we eat refined sugar it does not need to be broken down by the bodily mechanism. It immediately permeates the intestinal wall and enters the blood stream in a flood. What happens? The rescue workers, the liver and the pancreas get busy. The sugar is turned into glucose and stored for future use. Now when this is continuously occuring it means a constant strain on the pancreas and liver. It is surprising how long our bodies can sustain abuse of this type. But that this must have a deletorious effect on the system is self-evident. You have two over-worked organs, and by tests it has

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been proven that the sugar contained in nine chocolates will upset the calcium-phosphorus balance for a period of twenty hours.

I take all my patients off sugar. A calcium-phosphorus test is made before and regularly thereafter. Naturally the first test is not indicative of the true state of their body chemistry, but the second is. After a month of being without sugar the natural sense of taste begins to return. All foods taste better and sweet is found where never noticed before. And in most instances, from then on the natural instinctive cravings for food will lead a person to choose those foods which has particular body needs and in proper quantities. Have you ever stopped to think what a wonderful mechanism our body is? We are thirsty. Take a drink, then quick as a flash we have had enough. How does our body know then to give us the signal "enough." It does though. Why not trust its direction in other matters of food and drink?

If you think that sugar and other devitalized foods are being over-stressed, let me tell you of primitive people, their diet, and state of health.

Dr. Weston Price is an authority on this subject and its relation to dental decay. He found among the primitives in Australia, Alaska, the South Sea Islands, and elsewhere that primitives, uninfluenced by civilization, had remarkable teeth and relatively few degenerative diseases. Their bony structures were fine and their physique wonderful. But they all ate foods which though simple and varying in kind with the locality were adequate as sources of vitamins and minerals. Candy, flour (white), and sugar, and things made therefrom were unknown. But as civilization moved in and the natives acquired the food habits of sugar and white flour, dental decay, tuberculosis, rickets, and other degenerative diseases reduced their numbers even as low as one-tenth the original number in two or three generations. These dietary changes were too sudden and, therefore, devastating to organisms which were incapable of rapid adaptation.

* * * * * *

DISEASE, DIAGNOSIS, AND TREATMENT

Today we will discuss a list of diseases all of which I consider to be due to nutritional deficiencies. Nothing is being done by the medical and dental world about them except to give local treatment or relief therapy in an attempt to keep down the worst symptoms of the disease. We will classify these diseases into the sympathetic and parasympathetic dominant groups. But first, let us note that disease takes place in two steps. 1) Susceptibility arises through loss of resistance; from our point of view, that is through the loss of calcium-phosphorus balance, 2) When our resistance is down then invasion by bacteria becomes easy, our

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bodies have become fertile fields for their habitation.

In the sympathetic dominants we have two types of dental difficulty. One is pyorrhea, and incidentally, pyorrhea and arthritis are the same diseases but are given different names as they are located in different parts of the body and assume slightly different forms. The second type of dental difficulty on this side of the endocrine system is the sub-gingival type of cavity.

Diabetes is a sympathetic dominant disease. Because the endocrines that are attached to the parasympathetic side are weak, the pancreas is not secreting sufficient insulin for the needs of the body. To treat diabetics with insulin does nothing to correct the deficiency which brought about the condition. An adequate diet must be used along with the insulin if we wish to really correct or cure the disease. In general, there is a deficiency of vitamins and the trace minerals. If these are added to the diet, it is possible to gradually reduce the doses of insulin.

Ulcers found in the sympathetic dominant means that the cells of the stomach have lost their resistance to the point where their own digestive juices are working on them. To cure them you put them on a bland diet - milk - to give those juices something to work on. But unless at the same time you put into the body the things which it needs in order to regain normal body chemistry and develop resistance of these cells to their own digestive juices, you cannot effect a cure.

Glaucoma is another sympathetic dominant disease with a high phosphorus and low calcium. It is very often cleared up by correcting the body chemistry. All of these cases mean insulin in small amounts together with nutritional treatment. Always remember when we give endocrine treatment without nutritional treatment we are doing the patient an injustice.

Cancer is a sympathetic dominant disease. If the calcium level can be raised and the phosphorus dropped, the patient can be comfortable. Universities have been working on cancer from the standpoint of body chemistry. One woman had her breast removed from cancer but it had spread. She was given X-ray treatments chiefly for phychological reasons, but X-ray treatments are painful. We thought we could satisfy her mental need of treatment by giving her insulin. This obliterated the pain of the X-ray treatment and by raising her calcium and lowering her phosphorus with insulin we were able to make her physically and mentally comfortable. Finally, we were giving her twenty units a day. Eventually the insulin requirement was so high that we stopped, and in a few days she died. But during the one and one-half years that we were treating her she could work in her garden and live comfortably.

Colitis, inflammation of the colon, is a nutritional deficiency disease. The very nature of it prevents the use of the type of foods that are valuable to recovery. The bland diet is the same for ulcers - milk, soda crackers, things that increase the

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deficiency. The difficulty can be removed immediately if the phosphorus can be lowered below the calcium level. When the calcium-phosphorus levels are in balance, then it is no longer necessary to use the endocrine parasympathetic stimulant, insulin. Temporarily though it is necessary until tolerance for the necessary foods is once more established. Nutritional treatment will, however, have to be continued.

A missionary in Bolivia was sent home to Johns Hopkins a year ago with tropical sprue. He was told that it was a deficiency disease. He was eating a high protein diet - no carbohydrates. For a while he was better, but after a few months began to get worse. Usually had a very sore tongue - fillings of both silver and gold under certain body conditions will set up electric currents in the mouth. We began insulin treatment to reduce the intestinal inflammation and we have stopped the electrolytic action though the patient still has those same fillings of both gold and silver. He is also gradually building up a tolerance for foods which he has been unable to take for several years. In this way he will eventually overcome the deficiency which caused the disease. As time goes on we will reduce and finally eliminate the use of insulin but increase his food intake to the normal point as regards variety and quantity.

Sinusitis can also be treated with insulin. Within a few hours after three units had been given, the inflammation in a case of mastoid sinusitis had gone down and pain was relieved.

Head colds - the most frequent disease known depends upon bodily resistance. When a person with balanced body chemistry gets a cold, he generally throws it off within thirty-six hours. When a cold drags on for a week or ten days or even longer, it is generally to be found that the body chemistry is inefficient.

Gall stones and gall bladder difficulties are due to a sympathetic dominance and are very painful. The use of insulin or honey has been found very effective as palliative treatment. This treatment gets them out of the sympathetic dominant stage, and by lowering the phosphorus does much to alleviate the pain.

Sympathetic dominants are susceptible to infantile paralysis. Note that Roosevelt is big through the chest and shoulders, thin through the legs. These are physical characteristics found in the sympathetic dominants. Roosevelt's son is a typical sympathetic dominant. He had an operation for ulcers.

In cases of kidney stones the use of trace minerals as found in kelp and used with insulin produces immediate results in any case that I have ever seen.

In obesity when the weight is on the upper part of the body, do not give thyroid, doubtless already has too much. Insulin is very often the correct treatment - the correct palliative treatment. The real treatment is nutritional, to restore the normal

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body chemistry.

Toxic goiter is hard to treat by nutritional means, but some cases are satisfactorily treated in this manner. The use of trace minerals must be undertaken with great care because the thyroid is already excitable. When a person is starved for food he is started with small amounts until able to handle a full meal. The same is true of mineral starvation. You get the digestive apparatus working a bit by giving as little as one-half grain of kelp a day until gradually it is possible to increase the amount as the excitability of the thyroid gland subsides.

Allergies. The intestines are made to be permeated by four substances - water, sugar, the fatty and amino acids, and the mineral salt, but sometimes the cells lose the function that controls this assimilation and then we get protein through the wall before it is broken down. In the past we made skin tests, then removed from the diet those things which caused an unfavorable reaction. However, you are increasing the deficiency that exists in the first plaoe. Allergies are symptoms of disturbed body chemistry.

Have one case, I believe it is cancer. A dentist's mother-in-law, who has been feeling pretty badly for some time, can't eat. She had been to some famous surgeon in New York and he reported that she had a cyst. In the six months preceding her visit to me she had lost forty pounds and she was pretty thin. When I saw her the only thing she had eaten in forty-eight hours was a small piece of fish. We gave her insulin and continued every day. Now she eats every thing. We gave her four units insulin and then gave her adequate nutrition. Now she does her own correcting. I don't know what the outcome will be. Anyhow, she is a plain case of sympathetic dominance. She has regained her weight and appetite and feels fine.

Case of encephalitis - partial paralysis. A month ago a young woman walked into my office putting one foot ahead of the other very slowly. I measured her - she measured 1.310. Strong sympathetic dominant - college graduate and one of the keenest minds I have ever seen. Quick to grasp - never forgets anything. We put her on insulin - eight units per day. In no time she could walk as good as anybody. We left it off and it returned in one day. I don't know that the outcome of that case will be, but anyway she has a job now. She is my secretary. Looking at things from this point of view, we want to learn about the person rather than the disease.

Degenerative diseases are so prevalent that we can hardly see anyone that has none. The way to prevent them seems to be to take people off sugar and put them on kelp and vitamins. All this we have learned through a chemical study of the environmental requirements of individuals. Someday we may learn more, some of this may be changed, but still for the present we can correct those who have intelligence to want to be corrected. Everyone should have a

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chance to live a normal life. It is just as intelligent to spend life learning something worthwhile - the realization that we are doing something to correct deficiencies is very worthwhile.

We have certain diseases that have characteristics of the parasympathetic dominant. Depositing arthritis, the type of pyorrhea that is associated with anemia, the white type of calculus, pale gums, sclerosis, kidney stones of the type that is composed of calcium, low blood pressure, and obesity, and cataracts are some. The treatment for these diseases due to parasympathetic dominance is nutritional as in the sympathetic dominants, but the endocrine extract used is thyroid as opposed to insulin.

Cataract case. A girl, eighteen years of age, came into the office. She had only fifteen per cent vision in both of her eyes. We started nutritional treatment and gave kelp, took her off sugar. We saw that the vitamin intake was good and the protein intake high. She had extremes in curves - breasts were firm - large legs - .4 degree above normal temperature - blood pressure was normal. She was keen and alert mentally - was secretary of the superintendent of schools. She would transcribe her notes when she was alone with a reading glass - was frightened - had a peculiar personality - optimist - popular with the boys. She like to drink beer - was sexually cold. She told me at this time, after we got acquainted, that she was going to marry her boss - she did not love him, he was the best one she could get. "He is engaged now, but I'll fix that up." My endocrine treatment was based on what I thought was sympathetic dominant and I used insulin besides nutritional treatment. In three months her vision had improved fifty per cent of normal. But then she stayed there. So we restudied the case. In the nude she had a peculiar figure; she looked as if her waist had a string tied around it. She was a little heavy above the hip bone, also had a little pad of fat between her shoulder blades. In body measurements she had proven to be slightly on the parasympathetic side, but every other indication was sympathetic. We finally decided that we couldn't do worse so treated her as a parasympathetic and gave her .2 grain of thyroid a day. Her temperature dropped with thyroid. She began to feel better although that did not seem to be sufficient. So we gave her anterior pituitary and she got well. By trial and error we finally found out what the deficiencies were, but please note that the first improvement was due to nutritional correction alone and in spite of the wrong endocrine treatment. This was an unusual case. The change in the girl's personality was the most remarkable thing that took place. She did marry her boss, but then she was in love with the guy - different than at first - she had changed from one girl to another. Her tendency was toward high phosphorus, but was very close to normal. The endocrine treatment was continued for about six months - 1cc every two weeks. Now the girl is fine and has had no recurrence of cataracts. In my experience with cataracts, if we can take the excess calcium from the blood, we get results. This method is very satisfactory in incipient cataracts. If the cataract gets dense enough to block off the circulation and vision is completely gone, there is

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no chance for the reversal of these deposits. This is the best case I have ever had to improve - we had age and everything else in our favor.

For a few minutes we will consider blood pressures and what they mean from the angle of autonomic imbalance. The systolic pressure is the upper one, diostolic, the lower. The difference between the two is the pulse pressure and it should be around fifty. Diostolic should be sixty-five to seventy. Systolic should be one hundred to one hundred and twenty. These pressures should not increase with age. When the diostolic is higher than seventy, it usually indicates sympathetic dominance. Add about fifty to whatever the diostolic is and we should have the systolic pressure. If you had a diostolic of sevevty or eighty and systolic of one hundred sixty or one hundred eighty, that would mean that the arteries were getting hard. The heart would have to exert more pressure on the blood stream in order to force it through. In the correction of so-called high blood pressure by means of autonomic balance, the diostolic is usually reduced. When we have a high diostolic, it usually means that the patient is sympathetic. If we can obtain balance, it means we should gradually reduce the high blood pressure. The treatment would be determined by the individual and what his chances are to respond to treatment.

Blood pressure case. Man of fifty had a pressure of one hundred eighty over one hundred. A year ago we took him off sugar and added kelp to his diet. No endocrine treatment has been given. But this nutritional correction alone has brought his pressure down to one hundred thirty-five over eighty. The diostolic pressure is not yet down as far as it should be, but the difference between the two pressures is now within the safety zone. He should continue to improve until everything is normal, and if his diet is continued, his improvement should be maintained.

Just a word about hydrocholic acid. It is a stimulant for parasympathetics. Fifteen drops well diluted in water or acidulin which is less dangerous to the teeth reacts almost immediately. This and thyroid in minute amounts are of assistance in keeping elderly people feeling fit. They are often parasympathetic and, therefore, manufacturing an insufficient amount of hydrochloric acid in their own systems. A little help to keep them autonomically in balance does much to make life worth living for them.

Anterior pituitary can be used in parasympathetic cases to assist and reduce the amounts of thyroid needed and posterior pituitary can be used in the same way with sympathetic dominant cases where insulin is used.

The body is wonderfully endowed to replace worn out and even diseased tissue if given the opportunity. In order to make these "repairs" it must have the right kinds of materials. As a result of investigation we stress the two following rules of health as basic:

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1) Give the body all the materials it needs. 2) Withhold the things that are injurious to it.

The principles for restoring and maintaining health are as simple as that. Because they are so simple it is easy to overlook or underestimate the fact that in them is wrapped up possibilities of physical well-being for a large share of all mankind. It has been proven, both by laboratory tests and through practical experience, that many persons with one or more of the deficiency diseases improve when the elements whose lack has caused the deficiency diseases are restored to the diet. Even people who consider themselves in perfect health may escape falling victim to them if they will but follow these basic rules. The ductless glands that have so much to do with body chemistry cannot function properly without quite a variety of organic minerals gained chiefly from eating vegetables and fruits; the glands of animals, such as liver, kidney, sweetbreads, tripe, etc., and sea foods.

We have seen that in order to enjoy good health we must have 1) A proper balance of calcium and phosphorus, and this can only be maintained by omitting white flour and sugar from the diet. 2) It is also necessary that we have the kind of food the body needs, including the trace minerals. As so many of the elements that our body chemistry demands are not in the soil and so do not exist in the produce of the soil, it becomes necessary to look elsewhere to supply this most vital deficiency in our diet. Fortunately all the minerals our endocrines need to make them function properly are found in a plant grown in the sea called kelp. By chemical analysis kelp is found to contain eleven minerals and by spectographic analysis at least thirteen others, and quite likely most of these minerals play a most important role in nutrition. By adding kelp to a diet free of sugar and white flour, one is not only sure of a supply of all these trace minerals, but also of a diet calculated to make it possible for the body to begin to return to normal, healthy functioning. As the body chemistry becomes normal, the endocrines are able to secrete properly, perhaps for the first time in one's life. The result is the calcium-phosphorus level is restored and there is no longer an excess of either element. Soon an adverse condition brought about by excess phosphorus begins to clear up; dental decay almost entirely ceases; one can confidently expect to see many nervous disorders improve; even one's disposition may become less irritable; an improvement should be seen in the stomach ulcers, pyorrhea, angina pectoris, and a less likelihood of a return of coronary thrombosis, the pain of acute arthritis begins to lessen and finally ceases, while the condition brought about by stones in the gall bladder or kidneys begins to show improvement, unless it is actually a case demanding operation. Unbelieveable as it may sound, the natural function of the Isles of Langerhans of the pancreas is gradually restored in diabetics so that the use of insulin must gradually be diminished until it finally can be dispensed with altogether. Or if there has been an excess of calcium, then deposits in the veins, joints, or eyes may be gradually carried away until high blood pressure is lowered, stiff joints become more supple, and even

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the growth of a cataract may begin to lessen.

Some individuals respond more quickly than others when their body chemistry is restored to normal, depending on many factors such as their lifelong habits, the hereditary condition of their endocrine system, and the gravity of their deficiency diseases. Some ailments like angina pectoris and prostatitis usually respond unbelieveably to this system of diet, while others, like arthritis, may take months of patient perseverance before results are noticeable. The inestimable reward of better health and increased joy in living awaits the two-fold program of 1) patient, faithful obedience to the two basic laws of body chemistry, and 2) the assurance of an adequate organic mineral intake by the daily use of kelp.

While a restored body chemistry promises great relief to many sufferers, perhaps it offers the greatest possibilities to those who are well. Just think of what it means to the great army of so-called well people if they can not only increase their health and vigor, but also lessen the possibility of ever having any of the deficiency diseases.

(Q) Can you do anything for asthmatics?

(A) Yes, kelp is almost a specific for asthma in children. Asthma in adults is not as easily nor as quickly handled.

(Q) What is the significance of craving for sugar in children?

(A) It means that their diet is deficient in something. Orginally, by supplying the desire for sweet, other things were supplied to the body, the vitamins and minerals which in a natural state would accompany the sweet. Now, however, we merely satisfy the desire for sweet and do not supply the other things which this signal is trying to tell us are needed. Natural sugar is always in combination with something else.

(Q) Will you talk about organic and inorganic calcium?

(A) My ideas on the subject are in opposition to those of many people, but I think that there is a general rule that the human being or any animal is different from the plant organism in inability to use the inorganic. It seems that the food minerals manufactured from inorganic minerals should be more suitable for us and the minerals in their organic form are more suitable for direct consumption by us. Take potassium, for instance. It is hard to tell the difference from potassium in soil or potassium in kelp. It apparently is identically the same thing. Maybe it is and maybe it isn't. Much work has been done very recently in which two substances can have the identical formula and be totally different. They are called isotopes. Our methods of analysis are very, very crude and still nature can do it very simply by means of hormones and enzymes, a process completely unknown to man. We are going into a field where our knowledge is very slight.

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In this, our concluding lecture, I would like to summarize what the bio-chemists have already learned; what effects are achieved through the application of this knowledge; how it can influence our economic life and what our responsibility is for the future.

We have learned that men are not alike. Men are different, and, therefore, each health problem which we undertake is an individual case. For this reason we must not be blinded by rules of procedure, those props for the insecure in knowledge, but rather be open-minded as to the possibilities of variation. Our task is one of service. Our obligation is to the patient, not to the physician, nor theirs to us. The most valuable aspect of this type of work is strictly preventitive - get a person before he is sick and make or rather keep him well. A dentist or a nutritionist has more opportunity for this than a physician. When well, the treatment is entirely nutritional and is simple. Throw a stone in the water and make a ripple - it is a law of physics that it will widen and spread. So with our work. The vibrations we set up are never going to stop.

We have learned that the essential differences between people lie in the differences of their endocrine patterns; that our endocrine patterns are determined by heredity before birth.

We have learned that generalized endocrine differences are reflected in physical characteristics and indicate certain dietary needs, i.e., the blue-eyed, long-headed people require more minerals than others; that proper nutrition is the only means of assuring us of the maximum efficiency of these organs, since their building materials are drawn from food; that the greatest concentration of vitamins and minerals in the body are to be found in the endocrines.

We have learned that since endocrines regulate growth, endocrine dysfunction is registered in body proportions. And, therefore, proportions or measurements are of assistance in the diagnosis of the direction in which poor body chemistry tends.

We have learned that the earliest indications of poor body chemistry may be found through the calcium-phosphorus test, this because the endocrines regulate the assimilation of calcium and phosphorus. When calcium and phosphorus are found to be out of balance, that is an index that the endocrines are not functioning normally. The slow-down or parasympathetic glands control calcium assimilation. High calcium levels predispose to depositing diseases such as cataracts, arterio-sclerosis, and chronic arthritis. The speed-up or sympathetic glands control the assimilation of phosphorus. High phosphorus levels predispose to infectious diseases or cardio-vascular trouble, inflammatory illnesses such as colitis, etc.

The calcium-phosphorus test has a three-fold use. 1) It gives the first sign of endocrine dysfunction. 2) It can be used to test the effects of food on the body chemistry. 3) It can be used

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to test the effects of treatment. When used as a test for the effects of sugar we find that nine chocolates, chiefly composed of refined sugar, upsets the calcium-phosphorus level for twenty hours. We know that to so upset the body chemistry continuously means susceptibility to disease. The effects of treatment are registered in the calcium-phosphorus levels. If there is evidence that calcium and phosphorus are coming more nearly into their proper proportions, we know that the treatment is correct and vice versa.

There are two methods of treatment. Nutritional correction is the permanent treatment, but temporary assistance may be obtained through the use of endocrine products. These extracts, however, if used alone will not bring about a complete recovery. The building materials for the continuance of a correctly fuantioning organ must be supplied regularly.

Thyroid extract in minute quantities is used when the slow-down glands are dominant and small amounts of insulin are used when the speed-up glands are dominant. This form of treatment tends to stimulate the weaker endocrines and depress the over-active ones thus bringing about the desired equal pull between these antagonistic groups of glands.

From the point of view of nutrition we have established two rules. 1) Eat all that is necessary and, 2) eliminate those things which are harmful. Refined sugar or even natural sugar in excess are found to upset the calcium-phosphorus level. White flour by displacement prevents the intake of more valuable food elements.

Carbohydrates, proteins, fats, vitamins, and minerals are all essentials of an adequate diet and are equally important. But vitamins may be lost through the improper preparation of foods and minerals, and the trace minerals are generally lacking due to poor soil conditions. However, once we are assured that our foods contain these elements we can depend, in the main, upon our instinctive taste to choose the foods which our particular mechanism requires and in the proper amounts.

The application of this knowledge about calcium-phosphorus levels, endocrines, and nutrition achieves results varying in degree. 1) In cases where the disease is not of too long standing, processes may be reversed and health restored through the balancing of body chemistry. 2) In cases where the disease has too strong a hold, its progress may be stopped though not reversed. 3) Where disease is not already established, but where susceptibility is indicated by lack of chemical balance, preventive work can be done. This, of course, is by far the most important contribution which the bio-chemist has to offer. As it is far better to shut the barn door before the horse is stolen, so it is far better to prevent illness than to cure it.

The high point of the bio-chemical approach is that is has proven of value in curing and preventing the degenerative diseases. The infectious theory of medicine has been unable to cope with these diseases which are due to a breakdown within the system

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itself. But now the bio-chemists with the calcium-phosphorus test as a key can locate bodily dysfunction before the ordinary symptoms of disease have time to appear. With this same key, the calcium-phosphorus test, he can check the effectiveness of his treatment of the disease.

The degenerative diseases are rapidly increasing. Deaths from pneumonia and other infectious diseases are in the minority and death from old age accounts for only about three per cent of the total. Heart troubles, kidney and circulatory difficulties, degenerative diseases, account for the largest portion of the yearly deaths. Now through the bio-chemical approach we have a strangle hold on this destructive force. Our best men need not die at fifty of coronary thrombosis. Now need our national strength be sapped by the natural inefficiency of the sick and near sick.

Economically this work is of importance. In big department stores, if the personnel department were trained to look for the symptoms which we seek, they would know whether or not a prospective employee would be physically up to the job and have the personality to put herself across. We could eliminate much of the wasteful turnover of help. Absences from work because of illness could be decreased. In the movie industry beautiful actresses could keep their beauty; beautiful women could be cultivated on purpose instead of growing by chance. The efficiency of most people could be increased. No one sick or half sick can function at their best. And in terms of human happiness, think of the gain. What kick do you get out of life? What can you put into it when you are sick?

The bio-chemical studies have also made us aware in part of the things which we waste in such a profligate manner. The number of tons of minerals which are yearly washed out of our soils is staggering. Our garbage, our sewerage, all have vital elements which we lose by pouring them out to sea. We are the most wasteful nation in the world. Older nations learned to conserve - we are just beginning to realize the importance of conservation. Roosevelt will be long remembered for teaching the farmer to plow furrows on the same level to hold the water so the top soil does not run off. Muddy streams like the Mississippi mean waste - valuable elements in the soil - if more than twelve inches below the surface, the soil has no value to us. When we lose the top soil, we have lost something never to be replaced. Some places in the West, especially in the dry regions, the top soil is deep. But in the East it is only about three inches deep. A large percentage of the farm land is unproductive and will remain so because everything has been taken out and nothing put back. What we are doing is so rapid that the effects are very serious. When we take something out of the ground we don't put it back - it is gone forever. What does the Chinaman do - he must not throw anything away - farming the same land for hundreds of years, he still keeps it in a productive state; he collects human waste and puts it back. We should learn that the soil does not belong to us; it belongs to the future generations and should be handed down intact.

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A patient of mine made quite a keen observation not long ago. We think of ourselves as individuals, and in way we are, but also we are links in a long chain; a long chain that goes back to the very beginning of man. This means something because all the chains that have been started have not been finished. Those that kept going adapted themselves to environmental conditions so that they could survive. Suppose that each generation transmitted only ninety-nine per cent of health and strength from the preceding generation, the end would be in sight. But what do we actually see in a period of three or four generations? A marked increase in disability. Grandchildren in general have much poorer health than the grandparents had. The rate of deterioration is not one per cent; it is far more than that. Most of us are long-headed Nordics, and in the past the Nordics were pirates and invaded pretty nearly every part of the known world and became rulers, but they never lasted more than eight or ten generation; they became extinct.

Most of us are on the way out unless we realize the factors involved. If we do not wish to become extinct, we must go back to the rules of nutrition again. Leave out things that don't belong there and take all that is necessary. Our bodies are today the same mechanical contrivances that they were thousands of years ago. Thousands of generations ago the chain was strong. Our ancestors have given us more than we know. We talk about heredity - we brag about it -- but what we have was given us. What we should be sure of is that we pass along to the next generation as good as we have received. We should see that the essentials are in our foods; have sufficient intelligence to use our environment properly; and unless we are absolutely sure, we know we can always eat the foods that we were intended to have - the natural foods.

It is an inspiration to find a group like this who are so interested in a new study; who hope to be able to do something, but who have chosen a field of work in which it is very difficult to make a living. By sticking together and giving each other everything, we learn; we are going to get somewhere. We have got to. It is our responsibility. We are going to take it seriously. We should be darn proud of ourselves because we have so much interest in things of such basic importance.

I have never met a better doggone crowd in my life, and I am proud to be a member of such a group.

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ALL REFINED SUGARS should be eliminated from the diet, either brown or white. Honey or molasses may be substituted for the refined sugars in limited amounts.

PREPARED DESSERTS generally contain sugar or sucrose. However, gelatin desserts can be made at home by using Knox gelatin. This permits the use of honey as a substitute sweetening. It is well to note that honey should be used in about one-half the amount called for of sugar. Tapioca and milk desserts can be made at home instead of purchased in the prepared packages. Tupelo honey is nearly tasteless and is, therefore, preferred by many who object to the strong flavor of honey.

CANNED FRUIT juices labelled as containing sugar or sweetening should be avoided. Look for the unsweetened.

ICE CREAM - make your own and use one-half or one-third quantity of honey that you would ordinarily use of sugar.

ALL SOFT DRINKS - to cool off, use citrus fruit juices in moderate amounts or add lemon juice to water without sweetening.

CAKES, COOKIES, and PIES - substitute honey or molasses as sweetening for these foods, but use in reduced amounts. Use dark flours. These foods should not be on the menu often.

CANDY - add small amount of honey to unsweetened chocolate, or use raisins, dates, etc., as substitutes for the candy.

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