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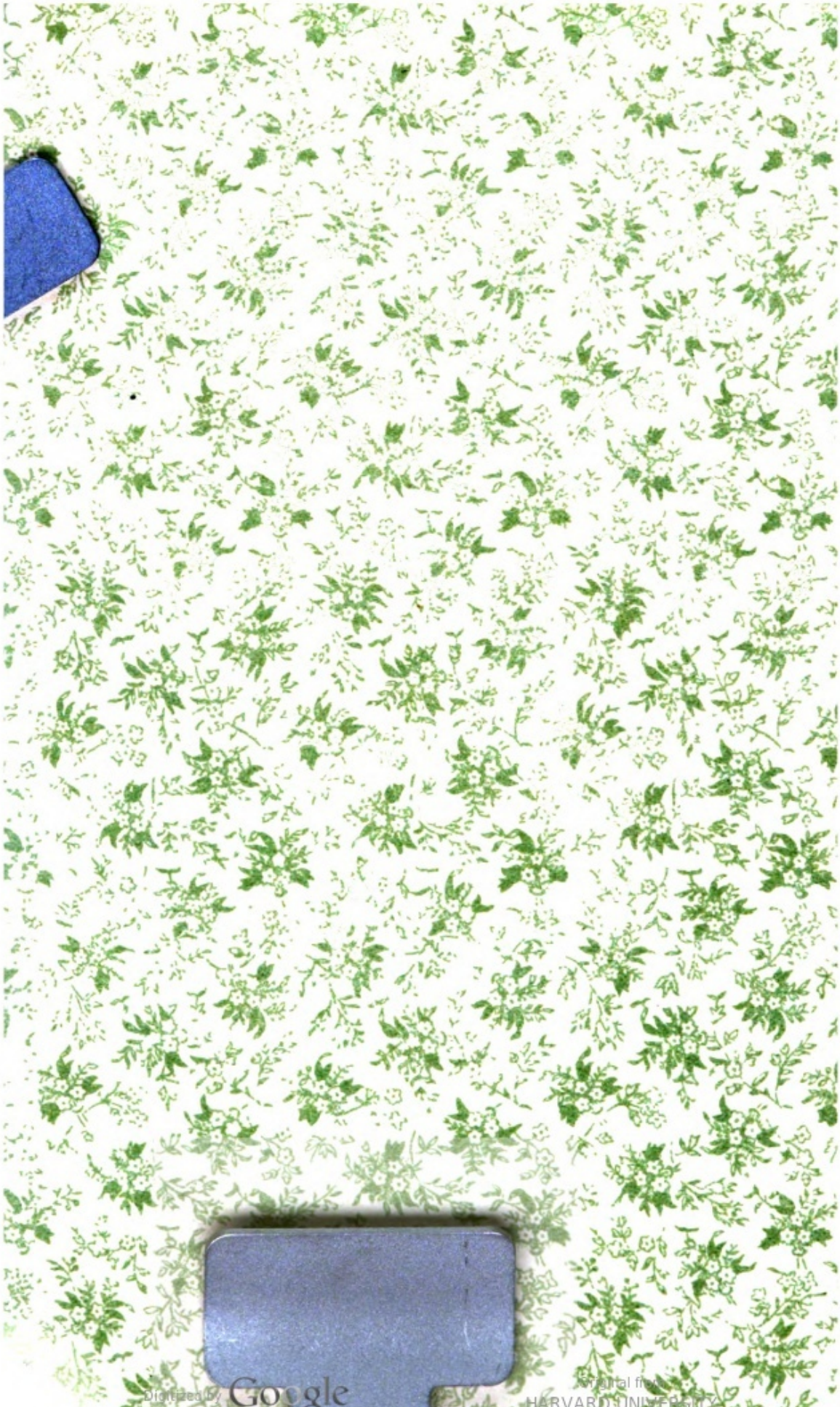
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Miss Isabel Jacks

A Merry Christmas
From your well-wisher
H. D. Percy

Dec 25th
1902

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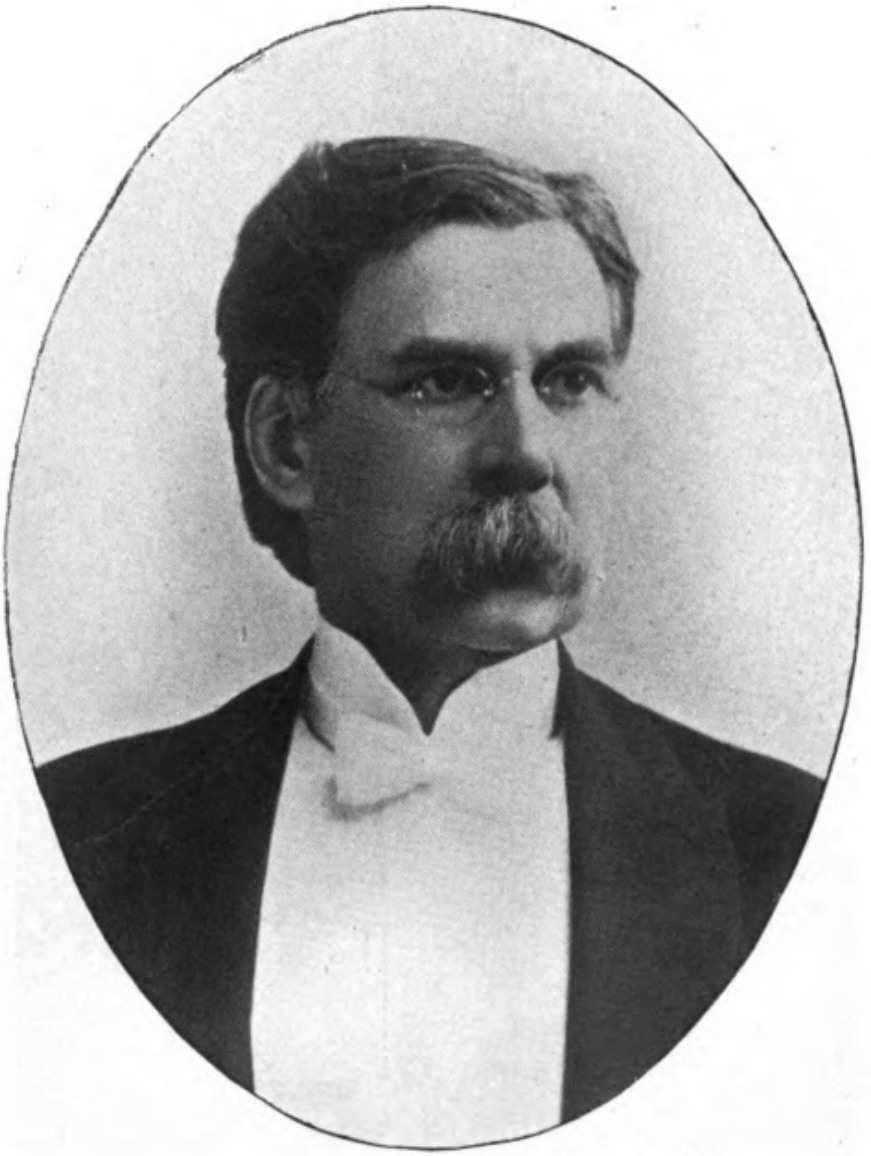

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WISDOM vs. FOOLISHNESS

By
HENRY D. PERKY
President of
OREAD INSTITUTE
WORCESTER
MASS.

SECOND EDITION

The Perky Publishing Co., Worcester, Mass.

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" Why does one climate and one soil endue
The blushing poppy with a crimson hue,
Yet leave the lily pale, and tinge the violet blue?"

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Introduction

It was circumstances that, ten years ago, led the author to begin an investigation of the causes of man's "many infirmities," and more particularly those infirmities which are directly traceable to malnutrition, or a species of starvation, while there was an abundance of proper food for all. Numerous lectures on the subject in the past several years was a result of this investigation. And there is no other reason to offer the reader for this publication than that many requests were received for copies of these lectures, two of which, with some changes, appear in this book, and others will be printed from time to time in this form.

The subject of the first one, "Nutrition as a Tooth-builder," was given at Providence, Rhode Island, at a convention of the New England Dental Association, in September, 1900, and afterwards in my course of lectures on "History of Foods," at Oread Institute of Domestic Science, at Worcester, Massachusetts. I shall endeavor to support my views as to the importance of this subject by a communication by William Hunter, M. D., F. R. C. P., to the "Practitioner," published by Cassell & Co., London, England, December, 1900. Though the communication of Dr. Hunter is lengthy, it is given in full, and, while it does not touch upon the food question, it makes plain the enormity of the offense of those responsible for poor teeth, and it is for this reason mainly the article is

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here reproduced. It is good reading for doctors, dentists, teachers, pastors and parents. Dr. Hunter has under consideration the consequences of poor teeth as manifested in most unfortunate conditions and suffering, and gives examples which are the result of avoidable error. Man should have sound teeth, and he may have. It is for the parents of children to determine. The burden, however, falls upon the mother. The father is in "business." He has no time in this age of rush and push to inform himself on this subject. He is the victim of an age of commerce, and so is his child. When wealth-getting is uppermost in the minds of a people, they degenerate.

In my second lecture, which was also given at Oread Institute, the thought was to interest the pastor and the teacher, and to thus aid in creating a public sentiment in this direction. The subject: "Duty of Pastor and Teacher in Relation to the Food Subject."

Benjamin Franklin taught that good morals resulted from proper food, and both Franklin and Thomas Jefferson criticized a system of education and code of morals or religion that was so formal as to be lacking in those essentials that make the true man.

The "good book" teaches us, "Thou shalt not eat any abominable thing." From this (a very good text for our ministers) we learn that there is wisdom in selection. It is fair, too, I presume, to conclude that a food that causes the mouth, the fountain, or source, whence food enters the body, to be foul with decayed teeth, is abominable; and none the less abominable is a food which causes indigestion, rheumatism, diabetes, or any of the many ills of the flesh. The

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conflict of opinion from innumerable so-called scientific sources leaves the superficial investigator of the food subject in doubt and in trouble, and well may parents without the opportunity to investigate cry out, "How shall we know what to provide for ourselves and children?" There is plenty of food, and proper food, but it is the acquired habit that will be found the greatest obstacle. See that your food is the natural product, be firm in the faith that there was ample provision made whereby a man may be a man. Hold fast to this potent truth. Above all, quit fretting about what you eat, and this you may do when you accept the truth that the chemistry of Nature is the only method, even divine in origin, to gather together from the air and the earth the properties, and in the process of growth organize them exactly suited for the purposes for which food is intended. We do know, from a study of the history of foods of the different civilizations, and from the experiences of the peoples of the world, and the conclusion is irresistible, that man must eat natural foods or degenerate, and finally through unnecessary suffering, prematurely die. How different with the man who has availed himself of his opportunities. And while it would be gratifying to know all the reasons why sound teeth and good health result from the use of natural foods, and why the same chemical properties in a disorganized or separated state do not answer the purpose as food, it would be foolish to deprive ourselves of what has been proven to be good, simply because we cannot fully understand what to man's senses are regarded as the mysteries of Nature.

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" Why does one climate and one soil endue
The blushing poppy with a crimson hue,
Yet leave the lily pale, and tinge the violet blue?"

If we know not why, we nevertheless may, and should and do enjoy these incomparable products and gifts of natural organization. And so we may enjoy the food products, even to developing the perfect man, the highest expression of Supreme Intelligence.

In ancient times history was recorded in painting and sculpture. There were no printing presses then. In a great degree this was manifested in the construction of the Ducal Palace at Venice, which was centuries building. In the fourteenth century a part of the palace, requiring eighteen pillars, was erected. On the capitals of these pillars the sculptor cut his designs in marble, and thus aided in perpetuating the history of the then prospering republic. On the capital of the fourth pillar, in marble, appear the heads of children, representative of the fourteenth century. In the next century another part of the palace was built, also requiring eighteen pillars, and on the capital of one of them appear, in marble, the faces of children of the fifteenth century. I had the capitals of the pillars of both centuries photographed, and prints of them, somewhat restored, will be found between pages 38 and 39.

Ruskin, in "The Stones of Venice," has this to say about these children: "It is highly interesting to compare the child of the fourteenth century with the child of the fifteenth century. The early heads are full of youthful life, playful, humane, affectionate, beaming with sensation and vivacity, but with much manliness and firmness, also not a little cunning, and

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some cruelty, perhaps, beneath all; the features small and hard, and the eyes keen. There is the making of rough and great men in them. But the children of the fifteenth century are dull and smooth-faced dunces, without a single meaning line in the fatness of their stolid cheeks; and, although in the vulgar sense as handsome as the other children are ugly, capable of becoming nothing but perfumed coxcombs."

Is this bit of history not a warning to the man who is too busy in commercial pursuits—in making money—to come to understand the food subject or the deficiencies in our school curriculums? If he cares not for himself, how about the children he brings into the world without their consent, and then in ignorance permits, if not quite compels, an environment that makes impossible on proper lines, either physical, mental or moral development?

If the cost to know the truth is great, it is infinitely greater not to know the truth as to the value of the food we eat. Not to understand the value of the food we eat leaves us subject to the effects of an active ignorance, which is always dangerous.

What we learn of value, on the subject of food for man, is mainly from the experiences of the individual person or community of people rather than from so-called scientific sources. What we must learn at great cost is to unlearn what we have been taught, for our education on this subject has been most thorough in the matter of suppressing unerring instinct, and creating appetites for things unnatural. We choose the food we do for no other reason than that we have been thus taught, and therefore have no better guide than the educated palate. The result is

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appalling. And is it not strange that out of the experiences in intense suffering and bodily disfigurement this lesson is learned? The processes by which the body of the healthy, vigorous man and woman are built are in harmony with simple and unalterable laws. To violate these laws means disaster. The understanding and observance of these laws simplifies the duties of those who are charged with the responsibility of selecting and preparing food suitable for the purposes intended. It is not so difficult to become possessed of a sufficient knowledge of these laws for all practical purposes as it is to become possessed of a sufficient power and moral courage to get rid of the appetites which our false teaching and years of habit have fastened upon us.

Here is the law: "Naturally organized food makes possible natural conditions; there is no other way." This law is written in the history of the peoples of all the civilizations of the world.

Foods are often so only in name. The law in the case will not permit of disassociating naturally allied properties which in the process of growth are combined in food for man in Nature's perfect laboratory. This work of disassociating is the exclusive function of the organs of the body in the processes of digestion; and it is thus the living principle, whether it be called nutrient, energy, electricity or something else, is liberated from the storehouse of abundance within the body under conditions as to degrees of temperature, etc., to make the properties in proper food available. While the ingenuity of man is great, he cannot make a grain of wheat. Its origin is Divine. Nor can he take a part of the properties of a grain of wheat and

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a part of the properties of any other naturally organized food product, or whether naturally organized or not, and combine these properties suited to man's condition as a food. When you take chlorine from common table salt you have sodium left, a metal with not the semblance of salt either in appearance or effect. So it is with all of Nature's ample provision of food products, they are perfectly suited to man's requirements when in their natural state, but unsuited in a disorganized state.

Noah either did not understand this law or defied its power, when he took the fermented extract from the grape rather than the naturally organized and perfect whole grape. Noah thus made an example for all the world and for all time and his mistake is recorded in ancient and modern history and in paintings and sculptures. Opposite page 14 may be found an illustration of Noah's predicament and his sons' humiliation. This illustration is also made from a photograph of the capital of a pilaster and support of the vine angle in the Ducal Palace at Venice. Observe the sons ashamed of and reproving the father. It often occurs that the father is ashamed of and reproves the son for the same reason; but it should be kept in mind that the father is also somebody's son and the product of his parents. Strong drink is the result of an educated palate, and an appetite which is but a craving for a stimulant due to a diet that failed to nourish; and its increasing use keeps pace with the increasing use of other disorganized and unnatural food and drink.

How helpless and dependent are children whose education as to their taste and choice of foods is

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under the direction of parents until the age of maturity. He is a resolute young man who will deny himself the "good things" his mother has taught him during half of an average lifetime to like. And there are indeed few persons when they have arrived at the age of majority, under these conditions who can hope for the full measure of good health which is everyone's birthright.

Is this handicap to a successful and happy life necessarily so? History tends to prove the answer in the affirmative but I contend it is all a matter of education. The trouble is with our schools which exclude in their curriculum the things most essential and fundamental. A true domestic science, a knowledge of how to make, provide for and keep and perpetuate the home should be taught in theory and practice in all our schools. When parents become intelligent, exemplary and in earnest in this matter they will be compensated in the physical, mental and moral upbuilding of their children.

I realize how little can be said in this small volume on so great a subject, and yet great as the subject, and small as this book, enough has been said it is hoped to induce the reader to make practical tests in harmony with what I conceive to be the law that governs. A test requires a choice between man's laws and natural laws, man's conceit, and wisdom. In the naturally organized whole food product is scientifically stored all that is good in food for man; in such food there is harmony and health. In the preparations which are parts of the perfect whole there is discord and disease. In the former there is found

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the wisdom of the Creator; in the latter there is found the foolishness of the creature.

But "man does not live by bread alone." The method of utilizing the abundance stored in proper food involves the whole question of man's conduct toward his fellow man. There is no power equal to good deeds to prepare the organs of man to perform the functions of digestion and assimilation; and here the law—the science—governing the appropriation by man of the abundance of good things which are his to enjoy is manifested. This law I will discuss in another volume of a series of little books of which this is the first.

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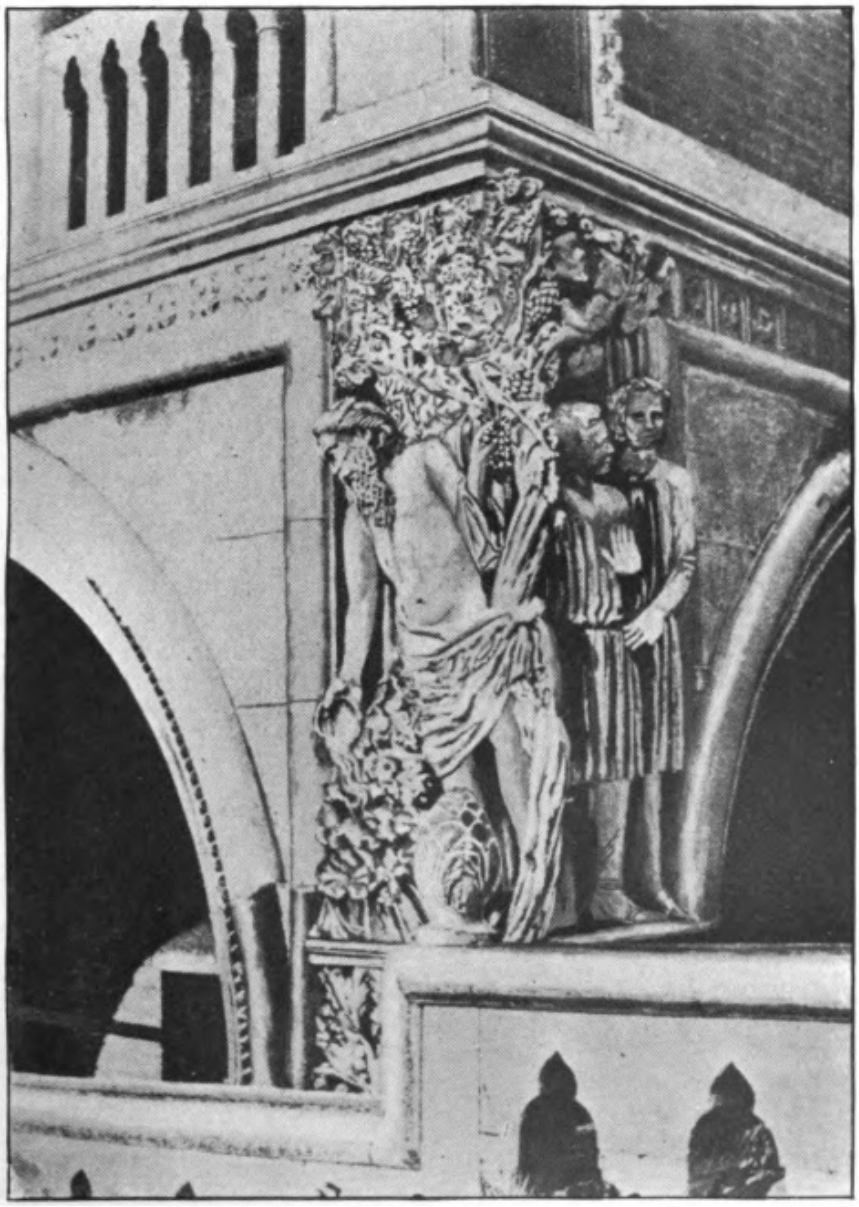

NOAH'S INTOXICATION AND HIS SONS' HUMILIATION

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Nutrition as a Tooth-builder

Life is sustained by food, and the measure of good health is determined, primarily, by the nature of food. It must contain the principles, without one jot of abatement, from which the body is built, sustained and renewed from day to day. However, food, to fulfill the purposes designed by nature, must undergo various processes in consumption, and the first of these is its preparation by the vigorous use of the teeth. It is to the importance of this preparation of food and its relation to life and health that a student of foods desires to draw attention.

One of the first of the lessons taught in theoretical dentistry is that the teeth in their anatomy are not, as people in general suppose, a part of the skeleton, but are attached to it. Though similar in their composition to the bones of the body they are subject, under certain conditions, to decay and total destruction, without, however, maiming the body in the sense that the loss of an arm, leg, or even finger would entail. In their anatomical organization the teeth consist in the main of dentine, enamel and cementum. Then, there is the pulp of every tooth that is alive and active. This pulp is the delicate yet powerful apparatus that aids in compounding and preparing the constituents for the formation of dentine and other parts. The pulp is the very heart of the tooth, the engine, so to speak, that immediately supplies means of activity

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without impairment through continued use. The nerves and blood-vessels of the tooth are contained in the pulp and, like every other organism of the body, it is discriminating in its action, selecting with an infallible accuracy, when opportunity is offered, just those particles from the food substances that are correct in kind, degree and proportion to construct and sustain the normal tooth.

Briefly, it may be said that the teeth are, in their construction, of a calcified nature. The calcification, or formation of the teeth is simply the conversion or secretion of the mineral substances contained in food into dentine and dental fibers. Teeth have one or more fangs or roots according to their class, and these roots are set and fastened in sockets, the technical designation of which is the alveolus. Through an aperture at the end of the root, there is direct connection between the pulp of the tooth and the other organisms of the body, forming, as it were, a route of intercommunication.

It is an accepted teaching of anatomy that the teeth are a portion of the digestive organs, and it is distinctly apparent that the process of digestion, set in operation by the teeth, should be in the highest degree correctly performed that the next succeeding work may not be hindered or imperfectly consummated. When the mouth closes upon a portion of solid food, it is the appropriate province of the teeth to bite and chew, to masticate finely and thoroughly, and as this mastication proceeds, the salivary glands are set in motion, resulting in deglutition of the mass, and the food enters the stomach, other conditions being normal, suitably prepared for further disposition. When

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mastication has been properly done, there is harmony of action between the digestive organs. Improper mastication throws all the digestive machinery out of order, an initial law of nature is violated, and the friction of error is manifest early in the process of digestion.

Nature's provisions are such that a man throughout life may have a complete set of teeth. It is not to be understood by this that old age does not bring, in its general decline of physical forces, a devitalization of the teeth. But surely it is natural for the teeth to last as long in their vitality as the bones of the body.

The durability of the teeth after death is shown, in countless instances, to be equally as great as that of other portions of the skeleton—in fact greater. The skulls of Egyptian mummies of perhaps the age of the Pharaohs are one and all quite certain to show full sets of teeth. Is this due to dentistry? Somewhere it is stated that the ancient Egyptians, along with their other accomplishments, understood dentistry. I am inclined to question their understanding dentistry to the extent that the science is known in our country at the present. I have yet to hear of the finding of an artificial set of teeth in the skull of an Egyptian mummy. Another striking illustration of the durability of the teeth in life and after death is furnished by the skulls of the prehistoric American mound-builders. Exhumations of hundreds and probably thousands of skeletons have been made from the mounds of Ohio and other Middle Western States, and scarcely without exception are found complete, or relatively complete, sets of teeth. At exactly what period of time these mound-builders lived is unknown. Their history is

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shrouded in deep mystery. We know simply that when De Soto and De La Salle made their early journeys into the interior of what is now the United States, the mound-builders had long become extinct. American ethnological research has, however, brought to the light of day the skulls of many of these ancients, and we have the opportunity of study and comparison which enables us to draw conclusions concerning the ways these ancients lived and the foods they ate, as revealed by an inspection of these bones.

In the Peabody Museum of American Archæology and Ethnology, which forms a part of Harvard University, is a large and valuable collection of the remains of this extinct race. In the same museum are also to be seen skulls of men who died in the remote past, exhumed from mounds and cemeteries in Tennessee. Like those of the mound-builders in Ohio, these skulls contain sets of teeth that are remarkable for completeness and soundness.

But, perhaps among the most notable instances of the durability of the teeth which I have the privilege of presenting to you are those of prehistoric men who are supposed to have lived and died in Peru in the eighth and ninth centuries. The collection of these skeletons is also to be found in the Peabody Museum at Harvard University. History teaches that centuries before their conquest by the Spaniards there existed in Peru and Mexico a magnificent civilization. That the Peruvians possessed a knowledge of many arts and sciences which only a high degree of civilization could inspire and develop we know by the remains of their works the ruins of which are yet to be seen. They knew of a way of embalming the dead

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that was as marvelous as that so extensively and successfully employed by the Egyptians; and because of this knowledge, archæological research among the dry bones of the Andes has brought to our sight the skeletons of the men who lived at least twelve centuries ago. In a sense the physical remains of these remote Peruvians are more than mere skeletons, for in each individual instance the flesh still adheres to the bones, though dried to a crisp. Upon some there yet remains the hair of the head, still retaining its color. But what relates more particularly to our subject is the fact that scarcely without exception each skull presents a complete set of teeth. In only one or two instances is a tooth gone and that has been lost by the breaking away of that portion of the bony socket in which it rested. Taking the Peruvian collection of skeletons as a whole, the teeth may be called perfect so far as their formation goes. In the department of comparative anatomy in the building of the Boston Natural History Society are to be seen skulls also of ancient and prehistoric Peruvians, and in these are complete and wonderfully well-formed teeth. Here is to be found also the skull of an Egyptian mummy showing evidence of great age, yet the teeth are all present and perfect in this skull in spite of the thousands of years that have passed since it was endowed with life. And here is to be seen the skull of an Ashante negro with every tooth intact, sound and fully developed, and it seems fair to presume representative of the race of the west coast of Africa. Still continuing a tour of the Boston Natural History Society's rooms a skeleton of a Hottentot, "the yellow fellow" of South Africa, is found. The conditions

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under which the Hottentot existed when in life were materially different from those of the Ashante negro. The climates of the two countries differ, and so do the foods, at least to an appreciable extent, yet with the Hottentot skeleton, as with that of the Ashante negro, every tooth is present in the skull, and the teeth are notably perfect, regular and sound. From South Africa to the island of Hawaii is a long distance, but it is desirable in this consideration to present information from as many points of the world as practicable, and thereby make the conclusions as credible and valuable as circumstances will admit. To this end the next illustration is that of a skeleton of an Hawaiian woman. How long ago she lived there are no means of knowing, but there is some evidence of a considerable age of the skeleton, and, as it shows a full quota of teeth which are as white as ivory, I conclude that the skeleton is not that of a modern-day Hawaiian, as the Hawaiians of to-day have teeth which lead to the suspicion that they are becoming Americanized in more ways than one. In this building are also numerous skulls of American Indians. The teeth in these are almost all remarkably alike for completeness, beauty of form and symmetry, and present evidence of general excellence. Indeed, of all the teeth I have observed in a wide range of races, civilized and uncivilized, there are none that surpass those of the aborigines of North America. In the Museum of Comparative Zoology of Harvard University is to be seen a complete skeleton of a Sioux Indian. The teeth are such as will please the eye of anyone, so perfect is their formation. While a single one or a score of instances do not establish the fact

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that the teeth of all Indians are good, it may be suggested that probably no one has ever seen decayed teeth in a full-blooded American Indian, provided he lived after the manner of the race and free from the ways of the white man. Under the laws of nature such a thing as defective teeth in an American Indian living as he did before the advent of the white man would be an exception, for unhandicapped by man, nature in working out results is infallible. As I understand the history of all uncivilized races existing under purely aboriginal conditions, they had and maintained properly developed teeth.

Turning from the human to the brute creation for a further exemplification of the durability of the teeth, we find in both wild and domesticated animals, evidence, practically inexhaustible, that when the teeth are built and sustained in accordance with the laws of nature they are as permanent, as free from defection, and as capable of as great duration as any bone in the structure. In the building of the Boston Natural History Society and in the Museum of Comparative Zoology at Harvard University are vast collections of the skeletons and skulls of wild and domesticated animals of every clime and zone. The teeth in all these have no more indication of decomposition than any other bone in the skeletons.

Having considered examples of the durability of teeth from various races, your attention is invited to the materials from which they are built, the sources whence these materials come, and the laws concerning their utilization in building, maintaining and preserving these important factors in, to our understanding, the somewhat complicated system of digestion.

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Chemistry teaches that the teeth are calcified organs, that the dentine which forms the bulk of the crown and root of a tooth is composed of about three-fourths mineral or earthy matter to one-fourth animal matter, that the enamel of the crown, which, by the way is the hardest part of a tooth and the hardest substance of the body, provided its formation is natural, contains almost ninety-seven per cent. of mineral salts and only a little above three per cent. of animal matter. This mineral matter that constitutes so large a proportion of the teeth is composed of the salts of lime, chiefly the phosphate of lime.

The anatomical relation of the teeth to the general organism of the body, has been mentioned in connection with the pulp in its cavity in the interior of the tooth from which is secreted the dentine, the enamel and the cementum which forms the surface of the root of the tooth.

The pulp comprises the nerve and blood-vessels of the tooth, and is connected with the general organism of the body by a delicate tissue passing through the root lengthwise. In plain terms the pulp of the tooth may be styled a distributing reservoir, its special purpose being to supply the dentine, enamel, and other portions of the tooth with their mineral and animal substances. Now, the existence of a distributing reservoir presupposes a main source of supply with direct communication between the two. Through the channel uniting the main and distributing reservoirs the properties desired is expected to pass. In nature the laws governing supply and demand are fixed and absolute. When the supply of the salts of lime and other substances ceases, then the

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pulp ceases the work of tooth-building. The teeth no longer fed become devitalized. The process of decay ensues and continues until the loss is entire. They simply die. The primary cause of this decay and loss of the teeth with attendant misery, suffering, and loss of health, is nothing less than starvation of the teeth. They died because they had not sufficient nourishment, even though the stomach of the body of which they were a part was gorged with food. It mattered not so long as this food did not contain the particular nutritive substances the teeth required, for in nature there are no compromises—no substitutes. Whence do the teeth get their lime and other substances? In the food we eat and by proper digestion make possible of appropriation. The philosophy of living as regards the sustenance of the body is eating under proper conditions sufficient food containing the nutritive constituents essential to the nourishment of every organ and portion of the body. This declaration I have simplified by the statement that "naturally organized foods make possible natural conditions," to which I add and am justified in adding the phrase, "and there is no other way." This is our platform in our crusade of education for proper living by proper foods. The beauty and strength of all nature lies in its simplicity, and in no other phase of nature is this simplicity more manifest or more plainly to be observed and understood than in the lesson I have for years labored to spread throughout the land that naturally organized foods make possible natural conditions; and there is no other way.

All foods as they come from the laboratory of nature are naturally organized, yet it is not to

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be understood by this that each in itself contains all the nutritive properties in correct proportions for the complete nourishment of the body. There must be a combination and a variety of properties in food to answer the purposes of perfect physical nourishment. However, this much can be said that in the grains, wheat, Indian corn, rice, rye, barley and oats, there is a decided approximation toward a complete food. Wheat is shown by analysis and by the experiences of various civilizations to stand at the head of all grains available for a universal food. The nutritive values of Indian corn and rye are also extremely high. Wheat was an important part of the food of the Egyptians long before the time of Moses. The people inhabiting the earth, from the earliest account until comparatively recent times, lived upon fruit, nuts and vegetables. Egypt has always been a land of fruit, grain and vegetables, and the annual inundations of the Nile have served to maintain the soil in the highest state of fertility. The Egyptians, whose mummies are found in museums and natural history rooms throughout America and Europe, had full sets of sound and fully developed teeth. This we know, for they are to be seen, and that, too, in bodies from which life departed two, three and even five thousand years before the dawn of the Christian era. Those Egyptians lived upon naturally organized foods that made possible natural conditions. Wheat and barley, grapes, figs and pomegranates, cucumbers and melons, onions, leeks and garlics. These last three it will be remembered the Israelites murmured for as Moses was piloting them through the wilderness from Egypt into the land of promise.

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What do we mean by fertility of the soil? Simply an abundance of proper food to the end that it shall give up abundant harvests and thus fully respond for the purposes intended in the unerring economy of nature. Nature asserts, with a positiveness that men take heed of, in the matter of plant life, no matter what its kind, that it can not attain its perfection unless the soil in which it is planted contains a requisite supply of necessary ingredients. Nature fertilizes the Nile Valley, but the soil of New England and most other countries, except where there is yet to be found a virgin soil, needs man's aid to supply plant food. These ingredients taken up and organized by plant life serve in turn as food for man and beast. The intelligent agriculturist recognizes the wisdom of feeding to the land proper food in proper amount that the plant growth may be proper food for his horses and cattle. But while we are careful to supply our fields with fertilizers containing the manufacturer's and dealer's guaranteed percentages of potash, phosphoric acid and nitrogen, and our horses and cattle with like assured requisite amounts of protein, fat, cellulose and free extract matter in food-stuffs, we give too little thought to the composition of food for ourselves and families. While the National and State Governments are expending millions of dollars annually to learn how best to feed the land, and to ascertain exactly what constitutes a balanced ration for a cow, horse, pig, or hen, comparatively little is expended by them, at least in a direct or practical way, to learn what is properly balanced food for man. For the year 1899 the National Government gave to the State of Massa-

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chusetts the sum of $15,000 for the use of its Hatch experiment station. In addition this little State itself gave directly and indirectly, the sum of more than $18,000 for its agricultural experiment station. This was wholly in addition to the sum granted the State agricultural college proper. The National Government gives to each State experiment station also a considerable sum for the same purpose. As I have said, the great effort of the agricultural college and the experiment station is to teach the farmer the use of proper food necessary to produce the desired plant growth. The State of Massachusetts has laws requiring that all cattle foods offered for sale in the State shall be sold under guaranteed analyses of their feeding value, and its experiment station has employees whose work it is to go up and down the State to see that these cattle foods contain the percentages claimed by their makers. Were a cattle food placed on the market in Massachusetts so deficient in phosphates as commercial white flour, it would probably have no sale, or, if any, at a ridiculously low price; and then I assume that no intelligent farmer would feed it to his cattle before inquiring at the experiment station as to the best means of making up the deficiency which has come about by the disorganizing and eliminating work of fine milling. And right here should be noted a common error and one fraught with more damage to humanity than words will ever be found adequate to express. The thought that you can make up for a deficiency, the result of a separation of naturally allied food properties which were organized in the process of growth, by supplying foreign properties which are also similarly separated proper-

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ties has no better or other support than is expressed in an ever-changing science emanating from the chemical laboratory of man, which not infrequently is opposed to the chemistry of nature. Do not by any means understand this as decrying agricultural education. But why should we, as a people, be so quick to accept the law that we can not get something from nothing as it applies to the feeding of land and animals, and ignore the same law when it comes to the feeding of ourselves and families? Have we, as a people, become so engrossed in wealth-hunting or purely sordid commercialism that we can see the way to happiness through health for our lands and cattle only, and not through the proper care of our children?

We can read the lesson every day of what transpires in nature through the lack of proper food in the soil to produce the tree, plant, or grain. In fields side by side we may see plant life, in one rugged and luxuriant, while in the other there is a spindling, weakened growth subject to the attacks of insects and disease. There is a faded, sickly color where there should be the deep green that indicates life and vigor. In the first instance, the plant life is finding in the soil the principles, that is food, from which it is nourished in every part. In the second field these ingredients are lacking, and its counterpart is found in the degeneracy of that once sturdy, rugged manhood of early New England.

The uncivilized man in all climes lives on naturally organized foods, and such as necessitates the vigorous use of teeth before the food is passed along in the process of digestion. The fine white teeth of the native African have long since become proverbial. Their

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whiteness would cause envy in the belle of the present-day civilization. So also was it as respects the teeth of the American Indian in his native environment. His food contained all the life-giving principles stored therein by nature, and when the Indian ate his corn from the ear or coarsely ground in some rude mortar, he was forced to chew it well before swallowing. The American Indian has been for centuries a product, in the main, of the corn indigenous to America. The nuts and fruits and game he ate in addition were all as nature planned and organized them. The Scriptures tell us that when Moses, in the exodus from Egypt, died on the threshold of the Promised Land "his eye was not dim nor his natural force abated." If the natural force of Moses before his death was not abated he must have then had good and natural teeth. The Mosaic laws of diet and sanitation given to the Israelites are still in force among the Hebraic races, and statistics show that the Jews are the longest-lived civilized people in the world. I have no data to prove that the Old Testament Israelites had good teeth, but President G. Stanley Hall of Clark University assures me that the exhumations of all ancient peoples show that all had perfect teeth. History teaches that in centuries preceding the present, mankind lived upon naturally organized food, and therefore I am confident they had sound teeth. In the brute creation of past and present, domesticated or untamed, it is rare that an instance of an unsound tooth is found. There may be abnormalities of birth, disease, or accident, but the well-nigh universal rule is normal teeth, sound and regular. Dr. George P. Penniman of Worcester, one of the most successful veterinarians in

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Massachusetts, and known to the profession throughout the country, tells me that the freedom from caries and other diseases of the teeth in domestic animals is wonderful in its degree; but only wonderful, of course, as you compare the teeth of the brute with the defective teeth of the man that has dominion over him, but seemingly not over himself. Dr. L. W. Curtis of Southbridge, a physician and surgeon of fifty-five years' practice, who has had unusual facilities for noting the characteristics of all kinds of domestic animals as well as men, gives the same kind of testimony in like emphatic, positive manner.

In the rooms of the Boston Natural History Society is the skeleton of a horse that died at the age of forty-two years. The teeth are all present, and not one of them shows any impairment of any kind. This horse had to work all his days after he was broken to harness. For eight years he was a stage horse on an old Boston and Roxbury line. Then for twenty-five years he was a street-car horse on the West End Company's line from Boston to Brookline. After his service on the street-car, "Old Billy," as he was called, was set to work in the West End Company's stable, and so continued until his death. He did not spend his last days in idleness, but "kept in harness" to the end. His natural food enabled him to work, and work is necessary to the assimilation of even good food. No man or beast can live their natural length of days when once the teeth are unsound.

Naturally organized foods make possible natural conditions, and this includes, of course, good teeth. But what are naturally organized foods? They are those which in the process of growth have extracted from

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the earth and the air, and compounded and organized in nature's perfect laboratory all the properties necessary to build the body in all its parts in normal and therefore perfect form and condition. The attempt to improve, on this perfect building material, is largely the cause of physical degeneracy the evidence of which is prominently manifest in poor teeth. Animal life in its wild and untamed state fulfills the law of nature as regards the foods whereby it is sustained. There is a diligent search for a supply, and when once this is secured it is not only as nature formed and perfected it, but there is in its eating that tooth action which thoroughly prepares the food for the next stage in the process of digestion. If there are instances of diseases of the teeth of wild animals they are exceedingly rare. This must be so, or otherwise there is no truth in nature. The ox, the horse, and sheep, and other domestic animals, choose those foods, when not prevented, that require thorough mastication. So in ancient times, man subsisted upon naturally organized foods. The Egyptian of the dynasties of the Pharaohs ate bread of the whole kernel of the wheat. So also did the Israelites in the time of Moses and the patriarchs, and this custom of preserving all the natural elements of the grains as food still obtains in all Eastern countries. A score or more of writers on Egypt and the Egyptians have told us that the ancient people of the Nile Valley had simply ideal teeth.

The people of the East and of the Orient live to-day, in the main, upon grain-food that necessitates mastication. Two vital purposes are thus accomplished. The necessary tooth action develops the jaws and the

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teeth alike, and second, there is complete nutrition of the teeth through eating food that contains all their natural elements, including the necessary lime, that goes to make some seventy-five per cent. of the dentine and ninety-six per cent. of the enamel of the teeth. These elements have been eliminated from the bread of the American that it may be white, and there is, as a consequence, a silent, insidious, and never-ceasing deservation of the teeth because there is not sufficient nutrition. Even a partial destruction of the teeth means a partial mastication of the food, and this means in turn an impairment of the physical forces. Intellectuality must have for its basis physical well-being in order that a full measure of benefit may be enjoyed. If we are a nation of people with impaired teeth and therefore impaired physical vitality, our intelligence will avail us but little in the hour of need. In fact, the intelligence of people who do not know enough to have good teeth may be called in question.

The numerous American dental organizations afford sufficient evidence that the teeth of the American people require a vast amount of professional attention. How is it with the teeth of other nationalities? At my request Dr. C. Frank Bliven of Worcester, personally investigated over a hundred cases among the heterogeneous population of that city. The investigations were chiefly among the poorer classes, and where but little personal attention of the teeth could be expected. Each examination reported bears the attestation of Dr. Bliven. These examinations include Finns, Swedes, Russians, Armenians and Syrians. They all state, without qualification, that white-flour bread

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and pastry are practically unknown in their native countries.

It is quite out of the question in this already too long paper to give the details of these examinations. But I may say that the teeth of these people were found superior in all respects to the teeth of the people of our own country. It was, however, the teeth of the Syrians, perfect in form and preservation, that attracted special attention. The report discloses that of twenty-seven Syrians whose teeth were examined, twenty-one or nearly seventy-five per cent., had first-class teeth. Thirteen, or nearly fifty per cent., showed no decay, and thirteen out of the twenty-seven were marked either perfect or excellent. It should be stated in this connection that a considerable number of these twenty-seven Syrians were mothers with babies in their arms. What motherhood means as affecting the condition of the teeth in the American women is well known. Dr. Bliven also noted the condition of the teeth of two score Syrian children without finding evidence of caries except in one instance. The doctor remarked, "This is really marvelous." But was it marvelous? No; but only natural, for they ate whole-wheat food—whole wheat, fruit and vegetables was and is the diet of these people. When it appeared to my own satisfaction that a whole-wheat diet contained all the properties more nearly in correct proportion than any other available food to build the harmonious physical body, including good teeth, and not only this, but that such a diet in a remarkably short time would arrest the decay of teeth, in fact that "naturally organized food makes possible natural conditions," I searched scientific works for proof of

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this position and was amazed not only to find absence of reference thereto, but great conflict of opinion as respects the causes of the infirmities of man so far as food contributed to these results. In this conflict of opinion from scientific sources what comfort could parents find—parents naturally solicitous for the welfare of their children? The histories of the different civilizations of the world show at what period in each civilization the people enjoyed the greatest immunity from conditions that beset our nineteenth century civilization—a civilization that boasts of its educational advantages and progress. Investigation on this line has been most satisfactory, for it has resulted in establishing that the periods when the people were strong and vigorous, when they had strong bones, good teeth, firm muscle, and when the truly great men and truly great women lived were in the early part of the history of each civilization. Always in these early periods the people lived on a simple diet of naturally organized food. Then they enjoyed the full benefits of the perfect chemistry of nature. When man became more civilized, so called, and took upon himself the task of improving upon the chemistry of nature by disorganizing nature's perfect handiwork and perfect body building material, the trouble began and civilizations perished in consequence.

The proposition that man can take a part of each whole of two or more food products, naturally and perfectly organized in nature's laboratory, and combine these parts into a food in his laboratory so as to improve upon nature, is the most stupendous error in any age and any civilization.

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The deorganization ot the structural elements in naturally organized food products is the greatest single factor in bringing about the ills of the present day, and is especially evidenced by the defective teeth of the people of our civilization.

So intimately associated in natural food products are the properties that build both tooth and nerve tissue that when one is eliminated the other is sure to follow, and so it is we find people with poor teeth usually nervous.

The intelligent dentist who by his advice directs the mother how to furnish the proper food to build proper teeth, at the same time directs her how to build good nerve tissue, and thus becomes a prime factor in the development of healthy human structures.

Upon no form of food, perfect in tooth-building material—in fact in all respects—have there been such senseless ravishes by man as those perpetrated on the marvelously perfect wheat berry. The output of food made from the separated parts of naturally allied properties of the perfect whole, of chemically converted and predigested food, either in whole or in part, and adulterated food, is the great crime, now on the increase, perpetrated against unsuspecting and confiding children and weak and suffering humanity generally. If the disorganization, adulteration and manipulation of foods continue with anything like the ratio of increase for the past few years, dentists, however expert they may be, will have difficulty in finding a basis for their mechanical operations. We can only hope for a remedy in education for the evils resulting from improper food. But when all a man is is what he is educated to be, or his education makes

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possible, what hope is there when our leading educators can not give a rational answer to the question —Why do you eat what you do? Why, out of the abundant supply of innumerable food products, do you select what you do? And so we might ply our educators with questions relative to their physical infirmities with no hope of information of practical value. They know, or seem to know, everything but that one thing fundamental, how to build the body into harmonious conditions. What an oversight in our educational system which costs the people countless millions of dollars!

A suggestion is made pointing a way out of the wilderness of self-inflicted pain and suffering. Our teachers must be educated in this fundamental work, for the A B C of proper food must be taught along with the A B C of our language. I can conceive of no place to begin this work unless indeed it be through that medium which always has, and always will, respond in cases of great emergency. We must, and I am sure we will not in vain, appeal to the mothers—mothers' clubs and women's clubs—who are the hope of our country, and through this medium a public sentiment can be created that will demand that true domestic science be taught in every school in the land. To do less is to expend the substance of the people in educational institutions with the result of handicapping our children in the race of life, and thus defeating the objects sought.

And may not appeal be made to the dentists of the country who are already organized for combined as well as individual effort? Through the pain and suffering of ignorance they are brought in contact with

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opportunities to aid in putting into operation effective agencies. They may give advice that will arrest decay of teeth, but better may advise the young mother in the matter so as to avert in her offspring the misfortunes of the mother. And how responsive will the mother or prospective mother be, for she will readily understand that poor teeth tend downward in the scale of life. What young man in the enjoyment of physical vigor and intelligence would want to make a woman thus deficient his life companion? What young woman in the prime of physical womanhood would tie herself to a man, even of intelligence, as the term is generally used, or wealth, who is without proper means of digesting the food he eats? Such a man, if he does not become a tartar, is sure to be in great degree a disappointment.

Dentists can see in our suggestion the way for ample remuneration for services which does not depend wholly on the misfortunes and sufferings of fellow beings. Would it not be infinitely more wise, more humane and more satisfactory to your patrons, to prevent disfigurement and suffering rather than to continually repair the ravishes of ignorance and error?

I am not unmindful how impossible it is to present in these few moments anything but a few thoughts on this great subject—the building of the harmonious human structure. If man may not be a man in all respects with every organ in perfect condition, there must have been a grievous error in the plan of creation. The fact is that suffering, not only as to conditions which relate to the teeth, but as to all conditions of suffering, is the result of the friction of error. To achieve for man, as relates to his physical

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structure, relatively what has been achieved by man, and made manifest in the mechanical and dumb brute world, would enable us to say of human beings what we say of the machines and of cattle—the objects sought have been attained. Can not the definite and well-rounded purposes for which man was created be also manifest in man? He should come first as compared with a machine or a cow, in the matter of proper development, but as regarded to-day he is the sacrifice, that development in commerce may progress in the interest of selfishness; and this, in truth, we are compelled to say, is the result of our present system of education.

Lest I may be misunderstood in my position in regard to our educational system, permit me to say in conclusion, and in a general way only, that practical education is too limited. Practical education by which the pupil is taught to understand not only theory but how to do with the hands—how to intelligently create something of value—how to be, in a practical way, a potent factor in the development of a better civilization—such an education—will safeguard the home and is the only way leading to a degree of contentment which will enable man to enjoy the good things so abundantly vouchsafed him—to a character of contentment that will enable him to digest and convert into desirable living tissue, including good teeth, the properties found in natural food and to attain to a state of physical and mental equilibrium which will cause an honest desire, and afford a practical way to fraternize with his fellow man.

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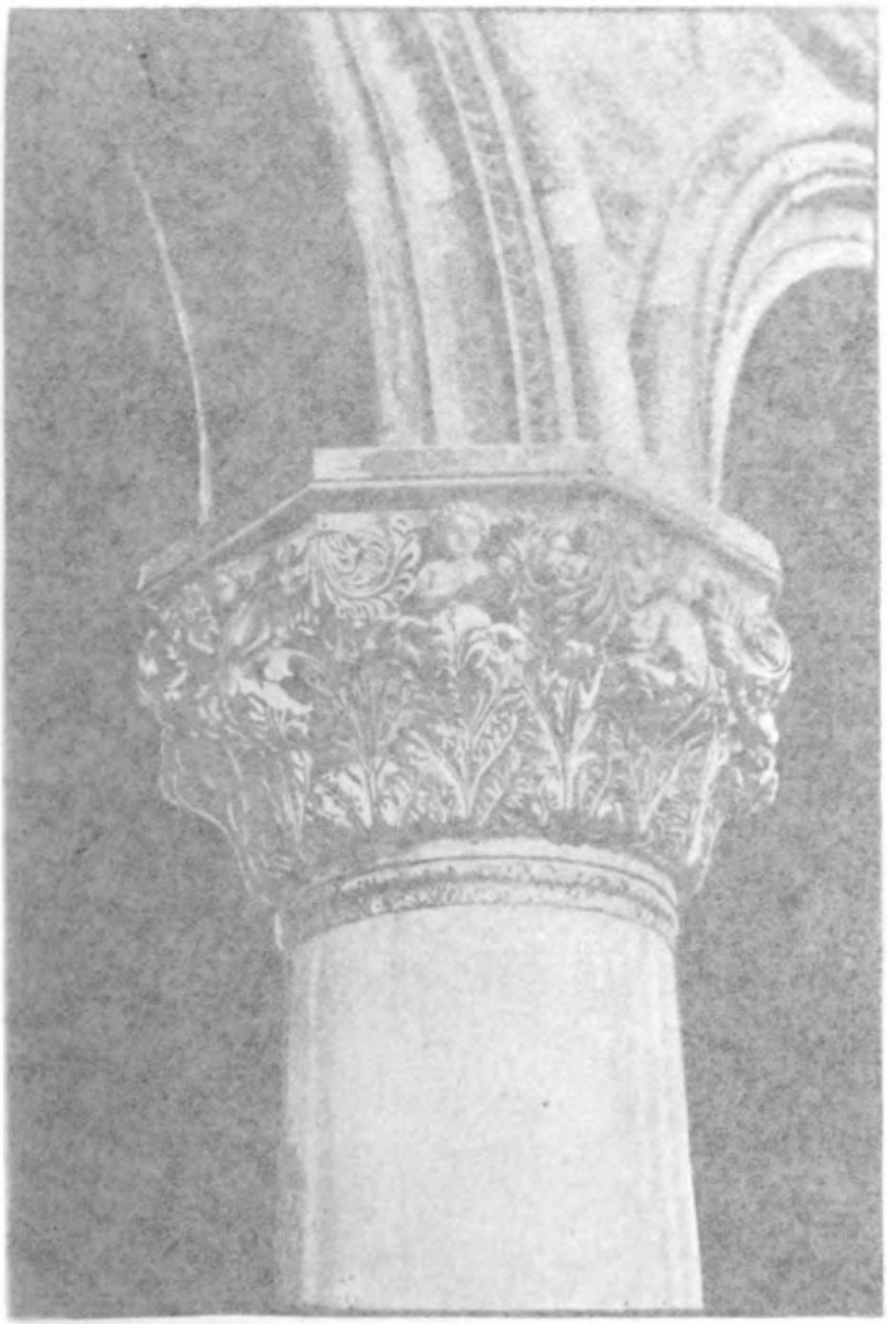

FIFTEENTH CENTURY VENETIAN CHILDREN'S FACES

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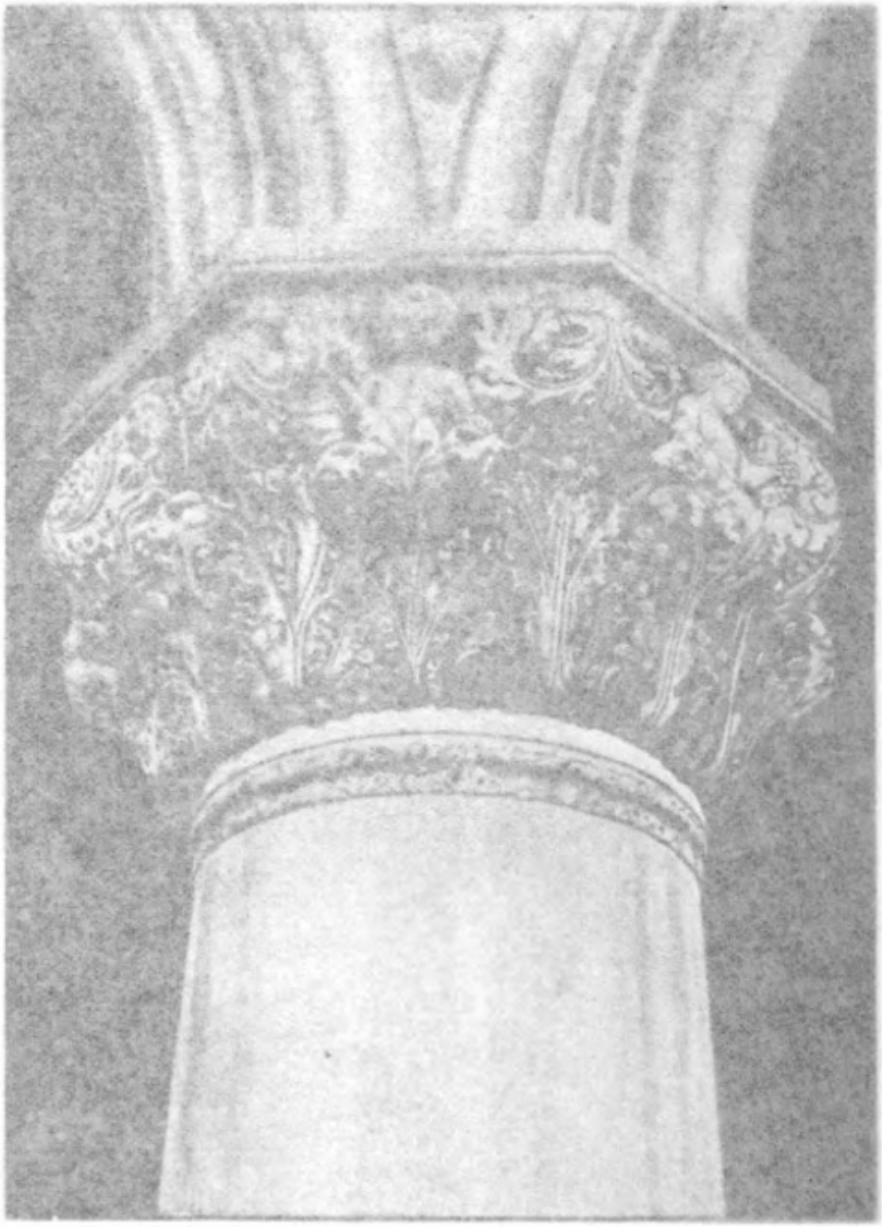

FOURTEENTH CENTURY VENETIAN CAPITAL

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FIFTEENTH CENTURY VENETIAN CHILDREN'S FACES

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Oral Sepsis as a Cause of "Septic Gastritis," "Toxic Neuritis," and Other Septic Conditions.

WITH ILLUSTRATIVE CASES.

By WILLIAM HUNTER, M. D., F. R. C. P.

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I.—INTRODUCTORY.

For the last twelve years, in connection with various studies, my attention has been called in increasing degree to an important and prevalent source of disease, one whose importance, I think, is not sufficiently recognized. The subject is oral sepsis—sepsis arising in connection with diseased conditions of the mouth. My attention was first drawn to it in connection with the pathology of anæmia; and since then it has been extended in connection with the pathology of a great number of infective diseases which have one factor in common—namely, septic organisms underlying them.

The case which brought to a head my interest in this subject was one I met with some two years ago. It definitely proved the connection between oral sepsis and one of its commonest effects—one so marked and so common that I have designated it by a special name, *Septic Gastritis*. Since then I have seen a large number of cases, illustrating both the frequency and the importance of the subject; illustrating, moreover, what I regard as even more striking—the extraordinary degree to which oral sepsis is over-

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looked, alike by all parties concerned—the physician, the surgeon, the patient.

I have already had occasion to draw attention to the subject; but additional experience only serves more and more to emphasize its importance from medical, surgical, and preventive medicine points of view. I desire here to point out once more how common a cause of disease it is, how grave are its effects, how constantly it is overlooked, and what remarkably beneficial results can be got from its removal. In so doing, it is not my purpose to select rare isolated cases from the literature in order to produce a picture which may arrest attention from its dark colors. I shall illustrate the subject by cases from my own experience, thereby bringing out how common the condition is. In so doing, I shall draw attention for the first time to a new and hitherto unrecognized effect of prolonged oral sepsis—namely, *Toxic Neuritis*.

II.—LOCAL EFFECTS OF ORAL SEPSIS.

The oral sepsis, to which I refer, is by no means confined to or associated with any one diseased condition of the mouth. Its local manifestations are very various. They include a whole series of local inflammatory and suppurative conditions met with in the mouth and adjacent parts.

In the Mouth.—Dental necrosis in all cases; gingivitis and stomatitis of every degree of intensity, inflammatory, pustular, ulcerative, sloughing, and gangrenous; periostitis; suppuration around decayed teeth; pyorrhœa alveolaris; deposition of tartar.

In the Jaws.—Periostitis, alveolar abscesses, osteitis, osteomyelitis, necrosis, maxillary abscess.

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In parts adjacent to the Mouth.— Tonsillitis, pharyngitis, otitis, glandular enlargements, cellulitis, post-pharyngeal abscess; in rarer cases thrombosis of veins, ethmoidal suppuration, and meningitis by direct extension.

The important fact to be recognized is that one and all of these various conditions, including dental caries itself, are septic in their nature, and produced by pus-forming organisms; that such organisms are invariably associated with every case of dental caries, however slight; and that the question of effect in any one case is a matter of individual resistance. The effects I have mentioned are very common; that they are not even more common is due to the remarkably resistant powers possessed by the mucosa of the mouth. How rapidly wounds in the mouth heal is well known. And yet, the sepsis connected with diseased teeth is of a particularly virulent character, much more so than the pus derived from soft tissues. It is really connected with disease of bone; and a somewhat extensive pathological experience of its effects, both professional and in my *post-mortem* work, has satisfied me that no pus organisms are so virulent as those grown in connection with necrosing bone.

The special interest of dental disease in connection with this class of cases arises from this: that dental cario-necrosis is the commonest and most prevalent infection in the body; and that this infection is of a "mixed" character, including not only harmless organisms, but also the most active pathogenic (blood poisoning) organisms—viz., streptococci and staphylococci.

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Bacteriology of Dental Caries.—On this point—the infective nature of dental caries—one need not dwell. The evidence so abundantly furnished by the laborious bacteriological observations of Miller (1884–1894) on no fewer than 250 cases of diseased teeth, of Galippe and Vignal (1889), of Jung (1893), and most recently of Professor Arkovy, of Budapest (1878–1898), seem conclusive. With the minutest bacteriological precautions, the last mentioned observer has in 43 cases studied in detail the organisms found in the most various conditions of teeth—*e. g.*, gangrene of pulp (both acute and chronic), chronic alveolar abscess, old stoppings, etc. The chief result of the observations from the dental point of view is to show that one organism is constantly to be found in diseased pulps and in dental caries (the *Bacillus gangrænæ pulpæ*), possessing the power single-handed of producing gangrene of pulp and of effecting softening of a tooth, *even in an alkaline medium*. Its frequency, as compared with other organisms, was 95.3 per cent. Next most frequent, and from the present point of view even more important, were various forms of pus organisms, viz.:

Staphylococcus pyogenes aureus, 34.8 per cent. of cases.

Streptococcus pyogenes, 23.2 per cent.

Staphylococcus pyogenes albus, 18.6 per cent.

Bacillus pyocyaneus, 9.3 per cent.

Staphylococcus pyogenes citreus, 4.6 per cent., with nine other organisms, mostly harmless, in varying frequency. The pyogenic organisms were always absent in teeth successfully dealt with antiseptically.

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The significance attaching to these observations in the present relation is not the mere presence of such organisms in connection with dental caries. Their mere presence in the mouth does not constitute disease of the mouth or elucidate the pathology of stomatitis, any more than the almost constant presence of the pneumococcus in the mouth constitutes pneumonia or elucidates its pathology.

Infective disease of the mouth, as elsewhere, is not, fortunately, a mere question of the presence of an organism, however pathogenic, but a question of *dose* and *resistance*. In the case of the mouth, the question of dose becomes a very important one, when we have to deal, not with an isolated carious tooth, but with a whole series of such teeth, not only dark and necrotic themselves, but lying in inflamed septic, possibly (as in Case 1) actively suppurating, sockets.

The effects of such a condition are not limited to the local sepsis thereby induced. They are more widespread, and they are of three kinds:

(1) Gastric and intestinal effects.

(2) Remote infections—including the whole series of infections caused by pyogenic organisms such as acute osteo-myeletis, ulcerative endocarditis, empyema, suppurative meningitis, suppurative nephritis, etc., with other obscure septic conditions characterized by fever, purpura, bleeding from gums, etc. It is with the first and the third of these groups that I propose here to deal with.

(3) Toxic effects.

III.—GASTRIC EFFECTS.

Gastric Effects.—The effects here include all those commonly associated with, and usually ascribed to,

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gastric catarrh—namely, nausea, distaste for food, bad taste in mouth, periodic sickness, gastric pain, feelings of sinking and emptiness of stomach, only relieved by constant eating and drinking, flatulent distension; sometimes salivation, and occasionally intestinal disturbance; all these, associated with poor nutrition, oftentimes great depression and weakness, and with a dirty, sallow look, which are the direct effects of septic absorption.

Next to the oral condition itself these are, without exception, the commonest effects of oral sepsis, and the most egregiously overlooked. Moreover, they are not confined especially to any one form of oral sepsis, such as pyorrhœa alveolaris. On the contrary, for every one case of gastric affection traceable to pyorrhœa alveolaris a hundred cases no less marked are daily met with associated with other septic inflammatory conditions of the gums so commonly met around necrosed carious teeth and roots. In short, they are produced by every form of oral trouble due to septic infection from diseased teeth, especially when that infection is aided, as it so often is, by such potent adjuncts as ill-fitting neglected septic tooth-plates, bridges, gold caps, metallic stoppings and the like.

It is in connection with this that I have had occasion recently to draw attention to some new and hitherto unrecognized effects of this poisoning—namely, that if there is a continual source of infective generation going on around these teeth, one may have infection occurring lower down in the gastric mucosa itself. It is this condition which I have proposed to designate by the title *Septic Gastritis*, this title "sep-

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tic" accurately describing the *cause* and the *nature* of the resulting catarrh.

The result of my recent observations has been to demonstrate a relationship between oral sepsis and gastric catarrh of a closer character than that hitherto recognized.

The Relation between Dental Disease and Indigestion.—That digestion is to a large degree conditioned by the state of the teeth—their presence or absence, their soundness, their freedom from pain—is generally recognized. But if inquiry were made as to the nature of the connection, opinions would be found to differ.

(1) In the minds of most, the relation is what one may term a "mechanical" one. Carious teeth mean imperfect mastication, consequently increased and unnecessary work for the stomach, this leading in course of time to the various ills connected with impaired digestion. Such a mechanical relation is by no means the only, or the most important, relation of dental disease to general health.

(2) In the minds of others the connection between bad teeth and bad health is supposed to be of another kind—viz., that bad teeth denote bad nutrition and bad health. They are the result of ill-health rather than the cause of it.

(3) A third possible relationship—far more important than either of the two above mentioned, and of one which no mention is to be found in recent treatises on stomach diseases—is, as I have had occasion recently to show, dental disease *as a cause of indigestion in consequence of being a continual source of septic poisoning and septic gastric infection*. That relationship I have thus described:

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(1) There is a limit to the capacity, even of the stomach, to resist indefinitely for periods of years the continuous presence of pyogenic (pus-forming) and other organisms derived from cario-necrotic conditions of the teeth.

(2) Its powers of destroying such organisms, although great, are never complete even in health; and are due solely to the presence of free HCl.

(3) These powers become progressively weakened when through any cause an increased and continuous supply of pus organisms is associated with a diminished, and continually lessening acidity of the gastric juice.

(4) These two conditions are precisely those produced by chronic cario-necrosis of the teeth.

(5) In time the catarrh of the stomach, so common a sequel of imperfect dentition—possibly of simply irritant nature to begin with, the result of fermentation—becomes septic in its character—becomes really a *septic gastric catarrh*.

(6) Eventually it may even lead to the deeper-seated changes which always result from chronic catarrh—viz., atrophy of secreting structures, with increase of fibrous tissue (chronic gastritis with atrophy of the glands).

The continuous swallowing of mouthfuls of pus organisms is not tolerated indefinitely by the stomach mucosa. The number of organisms that enter the stomach from the mouth is very large—the most of them to be destroyed, fortunately, by the gastric juice. But this is by no means true of all. A very considerable proportion (as many as eight out of twenty-five, according to Professor Miller) are to

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be found in the stomach contents. The observations of Macfadyen and others show that only a certain proportion are destroyed by the gastric juice. It is only when the acidity of the gastric juice is considerable—*e. g.*, an hour or two after food—that it exercises any direct bactericidal action.

In long-standing dental disease, the conditions are thus, I consider, precisely those most likely to produce infection of the stomach—viz., on the one hand, *diminished resistance*, *i. e.*, diminished acidity as a result of the chronic indigestion and catarrh; on the other hand, *increase of dose*, *i. e.*, increased supply of pus organisms from the necrotic teeth, reaching the stomach not only during digestion, but in the intervals between meals when the free HCl is at a minimum or *nil*. That under such circumstances disturbances may arise, from abnormal fermentative processes in the stomach, is a fact to which both clinical and pathological experience testifies—one, too, that is generally recognized. What, however, I find is, that the effect is not limited to a mere fermentation of food products, but that actual *infection of the mucosa* with pathogenic organisms may itself occur. The mucosa of the stomach continuously exposed to infection—*e. g.*, of pus organisms from the teeth—becomes eventually infected. A septic catarrh is set up, never got rid of, but continuously sustained by influx of septic organisms into the stomach; if continued long enough, this chronic catarrh leads to the usual effects of a glandular catarrh—viz., glandular atrophy, with increase of interstitial tissue around.

These considerations as to the possible effects, both general and local, of long-continued dental and oral

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sepsis are of no mere pathological interest. On the contrary, they are of supreme practical importance, exemplified as they are (to a degree which is, in my judgment and almost daily experience, altogether insufficiently recognized) by the cases one meets with of gastric catarrh in association with dental and oral sepsis.

The ashy-gray look and general languor which such patients, in one's experience, characteristically present, are really manifestations of long-continued septic absorption; the local symptoms of clamminess of the mouth, distaste for food, coated tongue, and bad taste in the mouth, which one simply looks upon as manifestations of gastric catarrh, are really the result of the oral sepsis; while the nausea, indigestion, and gastric discomfort are the result of "septic" gastric catarrh produced by direct infection of the stomach with the pus organisms.

These considerations, as I have thus put them, may appear so obvious that they require no further emphasis. But the cases I have to describe illustrate two points—first, the frequency of the conditions; and secondly, the extraordinary way in which the most remarkable conditions of oral sepsis are overlooked, while the patient is being all the time sedulously treated for the local effects.

Case 1 appears to me to present points of unique interest in demonstrating the actual relations between dental infection and gastritis—viz., the history of nausea and vomiting: gastric pain extending over a period of months—the pain so severe as to necessitate the use of opium and to suggest cancer; the scrupulous cleanliness of tooth-plates and the health-

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iness of the gums; the absence of all teeth except three carious ones, these latter discharging pus from their roots; the removal of these three; the immediate improvement, temporary in character; the recurrence of sickness and vomiting; the vomit three weeks after removal of the teeth still loaded with pus organisms; the administration of salicylic acid as a local antiseptic; the entire cessation of all gastric symptoms in three days; in three months a gain of a stone in weight; and lastly, the permanency of the cure. Fifteen months later the patient wrote that she had never had any return of the sickness.

Case 1 (1898).—Subacute gastritis in a lady aged sixty-two years. The patient suffered from severe intermittent sickness and gastric pain necessitating the use of morphia, of eight months' duration, with loss of weight and increasing weakness. Cancer was suspected, but on examination no sign of malignant disease was found in the stomach, the abdomen, the rectum, or the uterus. Constant complaint was made of a bitter taste in the mouth, nausea, with loathing and distaste for all food. The tongue was coated with a dirty moist fur. The patient had false teeth both in the upper and the lower jaws. The plates were scrupulously clean, and the gums beneath the plates were perfectly healthy. There were only three teeth in the jaws, and these were decayed, suppurating around the roots with pus welling up on pressure. There was no other sign of disease. A provisional diagnosis was made of gastritis caused by continual swallowing of pus. The stumps were ordered to be removed. A week later the tongue was clean, the sense of taste returned for the first time for eight months, and there had been only one attack of gastric pain. In another week there was a return of the sickness, with vomiting and pain and slight fever. The vomit obtained was free from food; it was watery, with rusty flakes consisting of mucus, fibrin, catarrhal cells, leucocytes, and blood, the whole being loaded with streptococcus and

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staphylococcus (pus) organisms, and a few bacilli. A diagnosis was made of infective ("septic") catarrh. As a local antiseptic three grains of salicylic acid were given thrice daily, peptonized milk as food, and counter-irritation was applied. There was complete cessation of all pain and a steady recovery from that time onward. When the patient was first seen her weight was 9 st. 10 lb., and a month later (after her illness) it was 9 st. 6 lb. Two months later it had increased to 10 st. 6 lb. She reported herself well and she has since remained well (after fifteen months).

Up to the time I met with this case my suspicions regarding the teeth were based on general grounds. Knowing how infective the organisms of dental caries were, such unhealthy teeth seemed to me to be *possible* sources of infection. I had no proof that infection from decayed suppurating teeth might be the direct cause of gastritis. This case was, therefore, a particularly crucial one in this relation. Had teeth as a whole been very bad—*e.g.*, a number of rotten stumps amidst a few fairly good teeth, the condition one so often meets with both in private and still more in hospital practice—and had they been all removed and replaced with good artificial teeth, it would have been difficult to decide whether the resulting improvement was due to removal of the teeth as *sources of infection*, or to improved appetite and better mastication. In this case, no change was made as regards new teeth, nor, indeed, was any necessary. The only change made was the removal of the three suppurating teeth, which had, the patient said, never caused her any trouble—indeed, she regarded them as "old friends," whose loss she greatly deplored. She said that "she had had them like that for twelve months or more"—her gas-

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tric trouble, be it noted, extending over about the same period of time.

I was able to demonstrate in this case, not only—

(1) The septic nature of the gastric catarrh—the catarrhal exudation vomited being loaded with pus organisms; but also—

(2) Its persistence, since the condition continued *three weeks after removal of all source of oral sepsis.*

How much more then is this condition likely to exist when the oral sepsis is extreme, as it often is, and the patient has to swallow pus organisms *continuously for many years!*

Case 2.—Shortly afterwards I saw an old gentleman, a man of strong build and fine physique. He came complaining of sickness and nausea, with disturbance of digestion, and a foul taste in his mouth. He could not eat butcher's meat as it tasted so bad. These symptoms had lasted twelve months when I saw him. On examination in the usual way, I found that his tongue was red and raw, looking like a piece of raw meat; both upper and lower gums were angry, and red and inflamed. He had two plates, one in the upper jaw, from which all the teeth had been extracted, and one in the lower jaw. The latter was removed with difficulty; it had not been taken out for a month or more and had become fixed. There was an extraordinary amount of decomposing septic material around the plates and beneath them. The lower jaw contained three black teeth, one of them loose, in addition to four old rotten stumps, one of which was loose. The diagnosis I made was subacute septic gastritis. The treatment was to boil his plates, to go at once to his dentist to show him the condition of his mouth before any treatment was commenced, so that the dentist might recognize that the trouble had been caused by these rotten teeth. The patient was then put upon milk diet. A week later he returned and said his dentist had seen nothing to remove. Yet even now one rotten stump was so loose that it could have been re-

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moved with one finger. He had been twice sick since I saw him, and had brought up a lot of black offensive matter. Since bringing that up he was better, and took his food better than for many months. "Yesterday he took a cutlet, which he enjoyed." The mouth was now clean, but was still a little red. The tongue had lost all its original beefy look. The gums were better, but sore, and there was still some stomatitis. I ordered him to scrub his mouth night and morning with disinfecting powder, and to paint the gums with an astringent wash, and to try another dentist.

Case 3.—Shortly after this, I had the case of a lady who was brought to me by her doctor for the following symptoms: For fifteen to twenty years she had suffered periodically from the most intense salivation at intervals of five or six weeks. It made her so ill that she was obliged to take to her bed. The attack usually passed off after what the doctor called a "diarrhœa attack." On examination, I found that she had the most extreme stomatitis all over her mouth; an acute, inflammatory condition, with pustules radiating up from carious roots and fangs. She had two plates, one above and one below, both of which she said were ill-fitting, so as to cause her discomfort. *She had had those plates for fifteen to twenty years, unchanged, and during that time she had only cleaned them with her toothbrush.* The condition of sepsis in connection with that may be easily imagined.

Case 4.—General condition: chronic indigestion, gastric pain, gastric catarrh. Oral condition: marked dental cario-necrosis, gingivitis, stomatitis, and pyorrhœa alveolaris. A gentleman sent to me (April, 1900) suffering from chronic indigestion, extending over many years. Pain, 2, 3 hours after food, with peculiar "sinking" feeling, only relieved by eating. *Mouth*: Teeth *very* bad, black and decayed, some of them loose; gums very red and inflamed; from one tooth pus welling out on pressure upon socket. Treatment: Oral antisepsis. Result: Five months later reported extraordinary benefit.

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The following cases illustrate how slight the local condition may be, and yet how marked—*on account of its septic character*—its effects in individual cases may be:

Case 5.—General symptoms: salivation, gastric discomfort, gastric catarrh. Oral condition: localized gingivitis beneath a gold bridge, which stretched between two gold caps. Immediate disappearance of symptoms on removing bridge and gold caps. A small pocket was found beneath the bridge, filled with pus organisms.

Case 6.—General symptoms: salivation and gastric discomfort, gastric catarrh. Oral condition: local gingivitis, in connection with a gold cap covering a crown. On removal of cap, its lower edge was found to cover a small carious cavity in the neck of the tooth. This case was in the same individual as the previous one. The symptoms disappeared on removal of the cap.

It is unnecessary to quote any more cases. Cases similar to the above could be multiplied indefinitely. In every out-patient department of every hospital one can see them daily by the dozen. The condition is so marked that one has only to look into the mouth of such patients to see what is the trouble.

IV.—TOXIC EFFECTS.

The effects I include under this title are those due to septic absorption, apart from any actual general infection.

They are extremely common, and, like all the other effects of oral sepsis, no less commonly overlooked.

The commonest manifestations of them are those I have already adverted to in connection with septic gastritis—namely, the dirty ashy-gray look and general languor, irritability, feelings of intense depression which I constantly find in these cases associated with

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oral sepsis, sometimes of the profoundest character, and *yet without any local symptoms.*

For these effects are by no means necessarily proportionate to the violence of the local symptoms. On the contrary, it is when local pain is absent that the oral sepsis is allowed to continue long enough to give rise to these toxic effects. At other times the *general* disturbances predominate.

They include not only the above general effects, but others of a more definite character. The following are among those I have met with:

(*a*) *Fever*—of obscure character—really septic.

(*b*) *Septic rashes.*

(*c*) *Purpuric hæmorrhages and bleeding from the gums*, such as one so often finds preceding ulcerative endocarditis.

(*d*) *Profound septicæmia.*

(*e*) Lastly, a group to which my studies in connection with pernicious anæmia have recently specially drawn my attention, and to which I now draw attention for the first time—namely, nervous effects, denoting deeper-seated changes in the nervous system; effects which I would include under the title of *Toxic Neuritis.*

The *Fever of septic absorption* has come, as the result of my experience, to present certain special features. It denotes the *degree of reaction* of the body, not necessarily the actual amount of septic absorption. It is the equivalent to inflammatory reaction locally.

This latter denotes relatively healthy conditions; it shows that the tissues still have the power to react to the irritant.

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There is a stage in septic conditions, as in other forms of infection, when the absence of local reaction is not only compatible with the profound septic effects, but, even more than any other circumstance, denotes the severity of the effects. I have known a patient to be utterly prostrate with subnormal temperature, extreme cardiac depression, and feeble pulse as the result of blood-poisoning; his hands and arms covered with a number of sluggish, dirty boils, none of them giving the slightest pain, or accompanied by any local inflammation; and I have seen in the same patient, a month later, when he was on the road to recovery, the most violent local inflammation, abscess formation, lymphangitis, and fever arising in connection with one of the sores on his hand.

In that case the actual toxic effects were greatest when the local effects were least. The absence of local effects was due to the very intensity of the poisoning. The tissues were able to offer no resistance at all. If the local effects had been as marked at the outset as they were at the termination, the general toxic effects would not have been so marked. They would have included the ordinary effects of blood-poisoning—namely, lymphangitis and high fever.

These statements as to the character and severity of the general effects may be illustrated by the following cases:

Case 7.—A lady who for several years had suffered from remarkable periodic attacks of *fever* and *rashes*, with marked *nervous disturbance*. These attacks had come on at regular intervals for two or three years, and I was called to see her when she had one of her rashes. I found she had a typical blotchy septic rash over the legs, arms, and body. Her history was that about a month or two previously

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her dental surgeon, having had his attention drawn to it by the first case I have described, had insisted on removing a tooth-plate from her upper jaw, *which had partly grown into the upper jaw*, and had been there for several years. Her condition was one of profound sepsis. Her periodic rashes, gastritis, and nervous disturbances were the acute manifestations of that. They had always been regarded as manifestations of gout.

Case 8.—A youth who had inflammation of his gums set up by withdrawal of a tooth. Extensive stomatitis set in, and spread from point to point until the teeth became loose and necrotic. Half the upper jaw became completely necrosed, and there was a foul gangrenous condition of the whole of the superior maxilla, an acute and *profound septicæmia*, *hæmorrhagic nephritis*, and death. This case still further illustrates the extraordinarily virulent character of the infection associated with diseased teeth.

Case 9.—I have now to point out that in connection with this dental caries you may have these pyogenic effects latent. Such a case was that of a man who presented no dental history during life, so far as could be ascertained. He died of pernicious anæmia. *Post-mortem*, the condition found was the following: The teeth were necrosed in their sockets, which presented a sodden appearance, and in this particular case at the bottom of one of them was an alveolar abscess the size of a small hazel-nut, leading by a sinus to the necrosed tooth. In connection with another tooth there was a smaller pus center. Further, there was suppuration in the ethmoidal sinuses on the left side.

Of the existence of this profoundly septic condition there was not, be it noted, the slightest symptom, or the slightest suspicion, during life. The case is especially interesting, fully confirming as it does my recent observations and conclusions regarding the infective (partly septic) nature of pernicious anæmia, and the importance of oral sepsis in relation to it.

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Toxic Neuritis.—This is an effect which is now drawn attention to for the first time, and appears to me to be worthy of study. As regards the importance of oral sepsis as a cause of neuritis, the following observations have been led up to by my studies regarding the importance of oral sepsis in pernicious anæmia, and the frequent occurrence of nervous effects in that disease—numbness, tingling in hands and feet, loss of knee jerk, marked wasting of certain muscles, and local palsies.

I find that precisely similar nervous lesions are met with, apart altogether from pernicious anæmia, in connection with extreme conditions of oral sepsis, and in my judgment as toxic effects of the sepsis thereby occasioned.

I append the notes of three cases which have recently come under my notice.

In all cases the nervous effects were very marked.

In all cases the most intense condition of oral sepsis prevailed, lasting for many years—in Case 12 for fourteen years.

In all cases immediate improvement resulted from removal of this condition.

Case 10.—D. P., thirty-three. Scene-shifter.

Ill two and a half months with wasting in both arms. Illness began with diarrhœa and pains in stomach, vomiting, lasting about three weeks. About a month after, noticed weakness in hands, with feeling of stiffness, and the weakness extended up both arms. It was accompanied by a sensation of "pins and needles." At this time he also suffered from acute pain in the stomach, was very depressed and anæmic. He was treated for this in the out-patient department; and he passed some blood-stained and mucoid stools after which he felt better.

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He came to the Electrical Department under my care for treatment of his arms. He was a spare man, ill-nourished, with a peculiarly dirty-gray sallow look. He suffered from a marked weakness and atrophy of all the muscles of both arms, as far up as the deltoids, and especially of the deltoids.

Trapezius, scapular, and rhomboid muscles not affected. They all reacted, although with diminished force, to faradism, with the exception of the posterior part of the deltoids. This last gave no reaction with faradism, and showed reaction of degeneration—viz., K. C. C. *nil*, sluggish reaction with A. C. C.

His mouth presented the most intense condition of oral sepsis, dirty black teeth, many of them loose, and extreme gingivitis.

This condition he had had for twelve years.

Three years ago was employed in mixing of paints. While thus employed he says he suffered from "muscular rheumatism." No recent history of lead-poisoning. He had rheumatic fever sixteen or seventeen years ago. His present illness began early last June, with violent vomiting and diarrhœa.

Sept. 20th.—*Treatment.*—Gums thoroughly swabbed with 1-20 carbolic acid, and a mouth-wash given of same (℥ 1 in half a tumbler of water; also syr. ferr. hypophosphit. ℥ 1; liq. arsenicalis, ♏ 2 *ter die*.

Sept. 25th.—Gingivitis and stomatitis much less. Some teeth still loose, greater power in arms. Can now flex arms freely at elbows.

Oct. 2d.—Improvement continues.

Oct. 4th.—Loose teeth removed.

Oct. 9th.—Mouth now clean, marked improvement in arms, all movements now free except those of shoulders; although muscles still wasted.

Case 11.—Mary G., thirty-three. Confined three months ago. Complaint since then weakness, numbness, and wasting of muscles of left thumb and fourth and fifth fingers. Pains up the arm to the left shoulder; great nervousness.

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Illness began with numbness in fourth and fifth fingers, followed by "pins and needles" sensation.

Sept. 23d.—Some tenderness of left median nerve. Marked wasting of muscles of thenar and hypothenar eminences.

She presents a dirty, sallow-looking color of face.

Mouth: Tooth-plate upper jaw, covering a number of teeth broken off; most intense gingivitis around roots. She has suffered greatly from bad teeth, and has suffered from indigestion for years.

Treatment: Gums swabbed with 1-20 carbolic, and an antiseptic mouth-wash ordered to be used morning and night. Salicylate of soda, 15 grs. dose thrice daily.

Tooth-plate not to be worn.

Oct. 2d.—Mouth condition much improved, again thoroughly swabbed. Power in left hand much better, no "pins and needles."

Oct. 9th.—Declares herself "wonderfully better." She has lost her former sallow look, and is now fresh complexioned. Mouth very clean, although roots still remain.

She can now grasp freely with left hand.

Case 12.—Aged thirty-four. Oct. 3, 1899.—Sought advice for wasting of muscles of left upper arm, and forearm and hand, commencing with the triceps and biceps. Muscles of shoulder (deltoid and trapezius) little if at all affected. The muscles affected correspond to distribution of musculo-spiral and median nerves. Both these nerves sensitive to pressure, and especially sensitive to electrical stimulation.

Electrical reactions: Stimulation with faradic and galvanic currents causes much pain, especially over nerves, and over internal and external cutaneous nerves. Faradic reactions much diminished; galvanic reactions increased, but K. C. C. still greater than A. C. C.

History: Illness came on a week before confinement, with "pins and needles" sensation; a week after, great pain with weakness in left arm and shoulders.

Diagnosis: Peripheral neuritis, especially of musculo-spiral nerve.

Treatment: Faradic bath (feeble current), with a view to prevent further wasting of muscles.

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Oct. 24, 1899.—Condition improved. Faradism not so painful.

Oct. 2, 1900.—Returned after having discontinued visits. Some improvement.

Mouth: **Shows extreme oral sepsis, which she states has lasted since age of twenty—*i. e.*, fourteen years. Between ages of twenty-four and twenty-seven she suffered severely from indigestion; at age of twenty-eight she had severe gastritis.**

Present condition: **Extreme stomatitis and gingivitis. Incisors of upper jaw loose, and at root of one of them an abscess cavity opening by a sinus from which pus wells out freely. This, she states, has existed for fourteen years. Only thirteen teeth serviceable, the remainder are represented by necrotic roots.**

These cases appear to me to be very suggestive as regards the possible *role* of toxic absorption in causing nervous effects. They open up a new field of inquiry.

V.—OVERSIGHT IN REGARD TO THE IMPORTANCE OF ORAL SEPSIS.

The relation betwixt a condition so productive of sepsis as cario-necrosis of the teeth and this group of local septic infections might appear so obvious as to require no special mention.

For the relationship is exemplified to a most marked degree in everyday experience of these cases, especially with regard to the commonest of these effects—viz., gingivitis, stomatitis, and pharyngitis. And yet I have now to point out that the close relation betwixt the two is very far from being recognized.

Not only in general treatises of medicine, but in special treatises dealing with the individual diseases, such subjects as *stomatitis* (inflammatory, ulcerative,

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or gangrenous), *tonsillitis*, *pharyngitis* are discussed without the slightest reference to sepsis within the mouth as a possible source of infection; and, as regards the teeth in particular, without other reference than to the possible effects of "persistent irritation by a broken or sharp tooth."

It is necessary, therefore, to refer briefly to some of the commonest of these local effects.

1. *Gingivitis and Stomatitis.*—It will have been noted how common both these conditions are in connection with dental cario-necrosis. They are, indeed, the commonest effects of sepsis in connection with diseased teeth. They are met with in every degree of intensity—from the slightest local inflammatory redness (gingivitis) around the neck of a carious tooth to the most general stomatitis affecting the mucous membrane of the whole mouth, gums, mucosa of cheeks, palate and pharynx.

It is always most intense around the diseased tooth or root.

At such parts it is not uncommon to find a line of pustules extending along the gum over the diseased root; still more common is it to be able to squeeze pus from between the gum and the diseased fang.

The cases in which it is most intense and most widespread are those in which tooth-plates are worn covering diseased roots; particularly if, as so often is the case, these tooth-plates are not removed regularly, and are thus allowed to become foul. In comparison with the condition which then results, the slight redness around an uncovered root is almost healthy. For in the latter case the sepsis has at least the chance of being limited to the gum immediately around, while

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in the former the discharge from the diseased gum is at once spread over the mouth between the gum and the plate.

Unfortunately for the patient, this stomatitis, however marked and extensive it may be, causes no pain.

It does not even cause any local discomfort; the symptoms at most are a foul taste in the mouth, especially in the morning, a distaste for food, loss of sense of taste, bad taste of food, occasionally salivation.

And when the patient seeks advice for these (and the gastric symptoms presently to be referred to, which are no less marked) the local symptoms connected with the mouth are referred to the indigestion; the mouth itself is generally overlooked.

How, then, does the matter stand with regard to the recognition of these oral conditions—their septic nature on the one hand, their possible relation as a cause of septic infection in adjacent parts on the other?

In general it may be said that, so far as importance is attached to them at all, they are regarded as the *effects* of general conditions, rather than as effects of local causes.

They are the result of indigestion and malnutrition rather than possible causes.

(1) *Catarrhal and Follicular Stomatitis*.—Just as the local symptoms (bad taste in the mouth, etc.) are regarded as the result of indigestion, so the local conditions ("*catarrhal stomatitis*," "*follicular stomatitis*") are ascribed, it might almost be said, to every possible cause, with the single exception of local septic trouble in the mouth.

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Thus in the case of children, in whom stomatitis is common, they are ascribed to errors of diet, irritant food, decomposing and indigestible food, prolonged sucking, uncleanliness of feeding vessels, disturbances of nutrition; in the case of adults, to excessive use of tobacco, stimulant foods and drinks, gastric and intestinal disturbances.

The only references to a possible local origin, connected, for example, with the teeth (and even such references are the exception), are where "the various disorders of dentition" in children, or "the irritation from a carious tooth" in adults are mentioned as a possible cause.

Any references to the septic character of these conditions, or to sepsis in connection with cario-necrotic teeth as even a possible cause of local trouble, are entirely wanting.

And yet in children such conditions are, to say the least, not uncommon. Thus in rickets, according to Dr. Eustace Smith, it is not uncommon to see a child of eighteen months or two years old with very few teeth as yet in his head, and these few black and carious.

Doubtless the rickety constitution is responsible for the late development and early caries of the teeth. But the caries being there, it is no less certain that, other conditions being favorable—*e. g.*, diminished resistance from ill-health—the sepsis connected with it will produce local effects, of which the earliest and the commonest will be stomatitis.

(2) *Ulcerative Stomatitis.*—The importance of this oversight with regard to the possible nature of these slighter degrees of stomatitis—"follicular," "dys-

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peptic," and the like—becomes more manifest when we come to deal with graver conditions of so-called "*ulcerative stomatitis*."

Because here the same line of thought is continued. Every factor is taken into consideration, except the possible local septic origin of the condition.

In children it is referred to gravely defective nutrition or improper feeding; in adults, to insanitary surroundings; "some local irritation," such as "a decayed or sharp tooth," mercurial poisoning, overcrowding. By only one of the most recent writers* is the condition of the teeth recognized as a very important element in the production of this form of stomatitis, inasmuch as it never appears before the teeth; the same writer also stating that "too much stress cannot be laid on the importance of observing the teeth from a medical standpoint, whether it be with regard to caries in adults as the probable cause of dyspepsia, or delayed dentition in children as an indication of improper feeding and rickets."

A reference such as this—limited though it be to carious teeth "as the probable cause of dyspepsia," or to delayed dentition in children "as an indication of improper feeding and rickets," goes far beyond the usual terms of reference to this subject.

Writers of general treatises of medicine make no reference to the subject at all, except in one relation. Examination of the teeth is always inculcated as important; since notching of the teeth may denote unsuspected syphilis; a blue line on the gums may suggest lead-poisoning, and looseness of the gums may denote scorbutic conditions.

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* Dr. Wills: "Allbutt's System of Medicine," vol. iii., p. 335.

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Nowhere is there any reference to the extraordinarily septic conditions seen in the mouth in everyday practice as the result of septic inflammation arising from necrotic teeth.

(3) *Tonsillitis.*—If the real nature of such obviously septic conditions as those I have just referred to, and their possible relation to the sepsis of the teeth, are systematically overlooked, it is not surprising that, the further we recede from the teeth, this should be even more the case.

Thus one of the commonest pyogenic infections in the mouth is *tonsillitis.*

In its list of possible causes every conceivable factor is mentioned; overwork, anxiety, all causes (whether local or general) which lower the resisting power of the tissues and render the individual more liable to infection — *e. g.*, chronic hypertrophy of glands, arthritic rheumatism, exposure to cold, sudden changes in temperature, septic poisoning from bad drainage, injury by a spicule of bone, or by mechanical injury; sometimes even the presence of calcareous cheesy masses in the crypts.

Every possible factor is thus noted, including "in not a few cases septic poisoning from bad drainage." But no mention is made of a source of septic poisoning far more common than bad drainage—viz., dental cario-necrosis with its septic conditions adjacent to the tonsils themselves.

Such conditions are at least extremely proximate sources of infection, one always ready to avail itself of any weakening of the powers of resistance by the other factors mentioned.

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The omission to recognize this possible source of infection is the more remarkable as the tonsils are more and more being recognized as themselves possible channels of infection, both pyogenic and tuberculous.

A liability to recurrent attacks of sore throat is one of the conditions I have observed associated with long-standing septic stomatitis.

(4) *Pharyngitis.*— In well-marked cases of stomatitis the general reddening is not limited to the gums, but invariably extends over the mucosa of the cheeks, the soft palate, and backwards on to the pharynx.

A condition of *pharyngitis* exists—acute or chronic catarrh, according to the severity of its cause.

This pharyngitis, like the accompanying stomatitis, is, I consider, a part result of the sepsis prevailing within the mouth.

Like the latter, it is got rid of by removal of the causes of this sepsis (necrosed teeth and septic stomatitis).

It is thus in my experience an invariable accompaniment of the conditions of gastric disturbances—"septic gastric catarrh," as I term it—which as I have shown, is one of the commonest effects of the oral sepsis.

The pharyngitis may thus be considered to be "septic" in origin, just as the stomatitis and the gastritis are.

This relation of certain forms of pharyngitis to oral sepsis is one that I find no mention of in the literature of the subject.

Its causes are considered to be *in the acute form: idiopathic*, exposure to cold, damp; *diathetic*, the poisons of rheumatism and gout; *toxic*, the action of

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drugs like antimony, mercury, belladonna, the virus of various infective diseases (measles, scarlet fever, and the like); *traumatic*, from burns, scalds, external violence and the like. In the still more common *chronic form*, general anæmia, dyspepsia, constipation, irritation of tobacco smoke, abuse of alcoholic drinks, exanthemata, and, lastly, improper methods of voice production.

Of these causes, dyspepsia and constipation are described by one of the latest writers* as the most potent; and the class of case thus arising he has been led to regard as toxic in origin, due to a failure on the part of the liver to destroy toxines resulting from imperfect digestion, or from decomposition in the intestine; these toxines, like belladonna, exerting a specific action on the pharyngeal mucous membrane.

The relation betwixt the pharyngitis and these various disturbances are, in my judgment of another kind. All the disturbances—gastric, intestinal, and hepatic—which are here had in view, as having some causal relation to the pharyngitis, are precisely the class of disturbances I have described as the results of septic gastritis.

The pharyngitis is not caused by them; but both alike are part results of the primary septic condition within the mouth.

The pharyngitis is a part effect of the oral sepsis, with the stomatitis and the septic gastritis.

(5) *Septic Gastritis*.—If, as has been seen, the most pronounced conditions of oral sepsis obvious to the eye are constantly overlooked, it is not surprising

* Dr. W. Williams; "Allbutt's System of Medicine," vol. iv., p.727.

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that its relation to more distant effects are overlooked.

And this is especially true of its gastric effects. Here the oral sepsis is constantly overlooked, while the patient is sedulously treated for its effects.

The physician, called on in his special sphere of duty to deal with gastric disorder of every kind and every degree of severity, is content to ascribe them to errors in food or drink, habits of eating, and other general conditions, and treats them for years with stomachic medicines—bismuth, rhubarb, soda gentian, and the like—while he overlooks the most pronounced conditions of sepsis in the mouth in connection with carious teeth, decayed roots, and every kind and degree of stomatitis; or, if he notes the condition of teeth he is content to ascribe the gastric disorder to imperfect mastication.

The surgeon who is punctilious to a degree—and most rightly so—in seeing that, so far as local scrubbing and disinfection can effect the result, no single septic organism shall remain in the portion of the skin he operates on to contaminate his wound; who regards—and rightly so—even one drop of pus in connection with his wound as an evidence of sepsis and of partial failure on his part to attain the perfection of results; whose whole life, it may be said, is passed in excluding and combating septic infection, even in its slightest degree; he also, without hesitation, will perform the most complicated and severe operations, *e. g.*, on the stomach or intestinal canal, without the slightest regard to the presence of septic teeth, septic roots, septic conditions of the gums and buccal mucous membrane.

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The dentist who does so much for his patient in these days of conservative dentistry and high professional dental skill; who sees so much of the unhealthy oral conditions connected with dental caries and necrosis; who, on the strength of his experience, can reproach the physician for his neglect of such conditions; he also will skilfully gold-cap a tooth, or put on a gold bridge, or supply a patient with tooth-plates —the gold cap to cover a diseased and blackened tooth, the bridge to form a compact and inaccessible pocket for the growth of pus organisms between itself and the gum; the tooth-plate to be worn for years, without any cleaning other than scrubbing, and, as often as not, covering foul septic necrotic stumps; or so ill-fitting that rather than be troubled with their removal the patient allows them to grow into the gums.

The patient—the sufferer—going to the physician for his gastritis, may be told in a general way to go to his dentist, to have his teeth put right and get new teeth to masticate his food; but as often as not declines to do so, because, in his words, "his teeth don't give him any trouble"—*i. e.*, pain. Finally, when he does go, the dentist naturally finds so much to be done that he is regarded by the patient as wishing to do too much. Even then he may find himself supplied with elaborate and ill-fitting tooth-plates, bridges, gold caps, stoppings—which may relieve completely, or, on the other hand, may be followed by a recurrence of his former troubles.

Lastly, when occasionally—fortunately very rarely —there is developed a condition of "phlegmonous gastritis," "suppurative gastritis," "mycotic gastritis," perigastric abscess, the pathologist is there to

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find pus infiltrating the coats of the stomach; to discover staphylococci and streptococci in corresponding abundance; to discuss the rarity of the condition and the influence of dietetic and other habits on its production; and to what extent the infection has arisen *de novo* in the stomach, or been introduced from the blood; while *ignoring altogether even the possibility* that the infection may have reached the stomach from the mouth.

The patient will have suffered much, heard much, and possibly medically and dentally been treated much; but as regards his teeth, the only fact he will have learnt is, that if he has not got proper teeth, he must expect to have indigestion, as naturally he cannot masticate his food properly.

Whereas the actual facts with regard to his condition of oral sepsis are, that—

(1) The condition of mouth associated with the presence of decayed teeth and rotten fangs is not simply a *want of teeth*, but is a condition of *profound sepsis*; and that, too, *irrespective* altogether of any pain or discomfort they may have from time to time caused, or even of the entire absence of such pain.

(2) The sepsis, moreover, is one differing from ordinary surgical sepsis, inasmuch as all the pus organisms are continuously being swallowed, probably over a period of many years.

(3) Further, it is a sepsis *connected with diseased bone* (*i.e.*, tooth), than which there is no more virulent form.

(4) While the gastric juice has fortunately a great capacity for killing organisms, this capacity is not

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complete, even in health, in the intervals between food when the acidity of the juice is at a minimum.

(5) The continuous influx of pus organisms from diseased teeth and gums must be a source of disturbance to the mucosa, causing catarrh and diminished gastric secretion.

(6) When we have diminished acidity of gastric juice with increased influx of organisms, we have the two conditions—*diminished resisting power* and *increase of dose*—which all pathological knowledge shows to be the two chief conditions underlying infection.

(7) Consequently the gastric catarrh becomes really a *septic catarrh* due to invasion of the mucosa with septic organisms.

(8) Further, apart altogether from its gastric effects, a continued production of pus in the mouth must be a source of danger in other ways.

(9) The mere *septic absorption* from such teeth and gums must be very considerable, lasting as it does over many years.

(10) The sallow look and languid feelings of which he complains, and which he and his doctor agree in referring to his chronic indigestion, are *really the expression of this septic absorption*.

(11) If pus organisms are constantly being swallowed, there is a risk of their infecting the tonsil over which they must pass, and hence tonsillitic, pharyngeal, and Eustachian tube infection may from time to time occur.

(12) Even apart from such local effects, there must always be a certain risk connected with the absorption into the blood of such organisms from fungating

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gums around diseased teeth; and, if other conditions are favorable, there may be infection from the blood—*e. g.*, ulcerative endocarditis, empyemata, meningitis, osteomyelitis, etc.

(13) In short, while every care has been and is being taken in increasing degree to *protect* him from noto-rious disease-producing organisms such as typhoid or tubercle bacilli, whether in the air he breathes, the food he takes, the water he drinks; and the utmost care is even taken by habits of cleanliness or stringent surgical precautions to protect any introduction of ordinary septic organisms by the skin—the mouth alone is disregarded, and he is left with a permanent condition of sepsis which, did it exist in any other part of the body, would at once receive immediate attention.

VI.—TREATMENT.

Treatment.—What I wish to emphasize is, that it is not the stomatitis, or the dental caries, or the absence of teeth, or any disturbance of nutrition in connection with defective teeth that causes all these effects. The condition in one and all is that of sepsis (I mean what is understood in surgery by sepsis); that is to say, we are dealing with pus-forming organisms which are constantly present in the mouth in connection with necrosed teeth.

In this connection I have already pointed out the inconsistency of us all.

No physician would tolerate for a moment that a person who has a foul septic ulcer on his arm should periodically suck it; and yet this is what is allowed to go on in the case of the mouth for periods of years unheeded alike by doctor and patient.

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A surgeon may be said to spend his life in combating septic infection; he surrounds himself at his work with everything scrupulously clean; he goes to every expense, and initiates arrangements of the most perfect order in his operating theaters; he will not even touch the skin without scrubbing or doing his best to get rid of all possible infection. But while doing all this, he will, without the slightest regard, operate when the mouth of his patient is in a septic condition, full of necrosed teeth, and full of the effects of necrosis.

With regard to the treatment of these cases, what I think wants fuller recognition on the part of all—physicians, surgeons, dental surgeons, and patients—is the septic nature of this condition of caries of the mouth. The gastric trouble is not the result of any dyspeptic trouble, or of ill-health, or of insufficient mastication; but is the result of sepsis caused by the carious teeth.

The matter, however, is important not only from the point of view of the gastric trouble, but of the infections in the body generally caused by pathogenic organisms; *locally*—acute and chronic tonsillitis, pharyngitis, otitis, follicular abscesses, glandular swellings in the neck in connection with diseased teeth; or more *remotely*—ulcerative endocarditis, meningitis, obscure septicæmia complicated by purpuric hæmorrhages, pyæmia, osteomyelitis; in fact the whole series of conditions caused by pus organisms.

The chief problem with regard to these conditions is to find out where the pus organisms have gained entrance. These organisms are not ubiquitous, but are definite organisms causing pus formations. We take most elaborate precautions to ensure our-

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selves against typhoid infection, either from drains or from water; and we take great precautions to protect ourselves from tubercle; and there is no reason why, when we are doing all this we should allow the most accessible part of the body to remain a favorable seat not only for the propagation but for the actual production of them. Therefore I consider that in regard to oral sepsis there is a wide field open for preventive medicine by the practice of oral antisepsis.

When I say oral antisepsis, I do not mean any general application of mild astringents or antiseptic washes. I mean—

(1) The direct treatment of each lesion in connection with a diseased tooth by strong antiseptic solutions: carbolic acid (1 in 20 or 1 in 40) rubbed in by means of a camel's-hair brush or a piece of cotton-wool directly over the diseased root. This treatment should be periodically applied to each diseased tooth as long as the patient delays having the tooth removed or as long as there is the slightest sign of redness around the root. A teaspoonful of 1 in 20 carbolic acid in half a tumbler of water forms an agreeable mouth-wash.

(2) Still better, it can be done by removing all diseased stumps and roots, in particular those lying underneath any tooth-plate.

(3) There is a necessity for recognition on the part of the dental surgeon that the conditions he deals with are in all cases septic; he must not be simply content to supply his patient with tooth-plates. The patient will have to be educated, and shown that these

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plates are the cause of septic trouble unless they are daily sterilized.

(4) There must be an entire avoidance of any dental apparatus (liable to become septic) which cannot be removed, and therefore which cannot be kept aseptic.

Oral antisepsis thus carried out is a field of preventive medicine which I think can be worked in with the most extraordinary success by the doctor, the surgeon, the dental surgeon, and the patient.

There is another matter of great practical importance. Who is to do all this? The physician sees the mouth condition, and sends the patient to the dentist. The chances are that the patient will not go there. The surgeon looks upon sepsis in the mouth as coming within the domain of the physician, unless there be an actual disease of the jaw. The dental surgeon will treat the diseased tooth dentally, but he will not have his patients come back in order to be treated locally. So the patient is left with his septic gingevitis and stomatitis.

I have been impressed by the neglect of the patient in this way, and I have tried, as I have narrated, the effect of sending patients in an extreme condition like that I have described (Case 2) to the dentist. He came back without having anything done.

Therefore the point is for each one to recognize that it is not an affair of the other. If you see a follicular tonsillitis or a quinsy, you do not immediately pass the patient on to a throat specialist; you treat it yourself. This condition of oral sepsis is one which can be treated successfully by all, even by the patient

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himself, provided its septic nature and its importance as a disease factor be fully grasped.

The effects I have described are very common. That they are not even more common is, as I have said, solely due to the remarkably resistive powers possessed by the mucosa of the mouth.

The great resisting power of the mouth is, however, no reason why such conditions of oral sepsis should be overlooked. How would one regard a physician or surgeon who allowed a patient to go about for many months, not to say years, with several small follicular abscesses in his tonsils? One would think it very neglectful; and if that patient came with a sallow look and with pus on the tonsils, the diagnosis would at once be, "Here is the cause of the condition"; and rightly so. But it is the rule to neglect similar cases in connection with the teeth.

The remarkable benefits to be obtained by the measures indicated I could illustrate by many cases.

The following one may suffice; it illustrates very well the extreme effects of oral sepsis; how resistant the tissues of the mouth are; how, *if its local septic nature be recognized*, the infection can be destroyed; and, lastly, the extraordinary recuperative power possessed by the mouth. Notwithstanding that at the time the treatment was carried out the patient was in a profoundly septicæmic condition, with commencing septic pneumonia, she eventually recovered.

Case 13.—A short time ago I was called in by a surgeon who had been called in by the doctor to see a lady for profound septic poisoning. She had a temperature of 105° and 106°, and a most extensive condition of ulcerative and almost gangrenous stomatitis. She had been in this condition for seven to ten days. She had had a tooth removed,

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and the root still remained. There was an abscess in the maxilla, and she nad a sinus, and about it pus lay around the gums. She had a sloughing condition of the mucous membrane of her hard palate. The treatment employed was local antisepsis, scrubbing the parts with one in twenty carbolic acid lotion, and cutting away with scissors the necrotic tissue on the palate, followed by removal of the broken root, and one dose of antistrep-tococcic serum. In forty-eight hours, as the result of the local treatment, despite that woman's desperate condition, the whole condition of gums and mouth looked fairly normal, though at that time she was almost moribund with septic pneumonia. She eventually recovered; but it took a doctor, a surgeon, a physician, and a dentist to rescue that patient from an illness which could with certainty have been avoided, if in the first instance, after the extraction of her tooth, her mouth had been washed daily with an antiseptic lotion.

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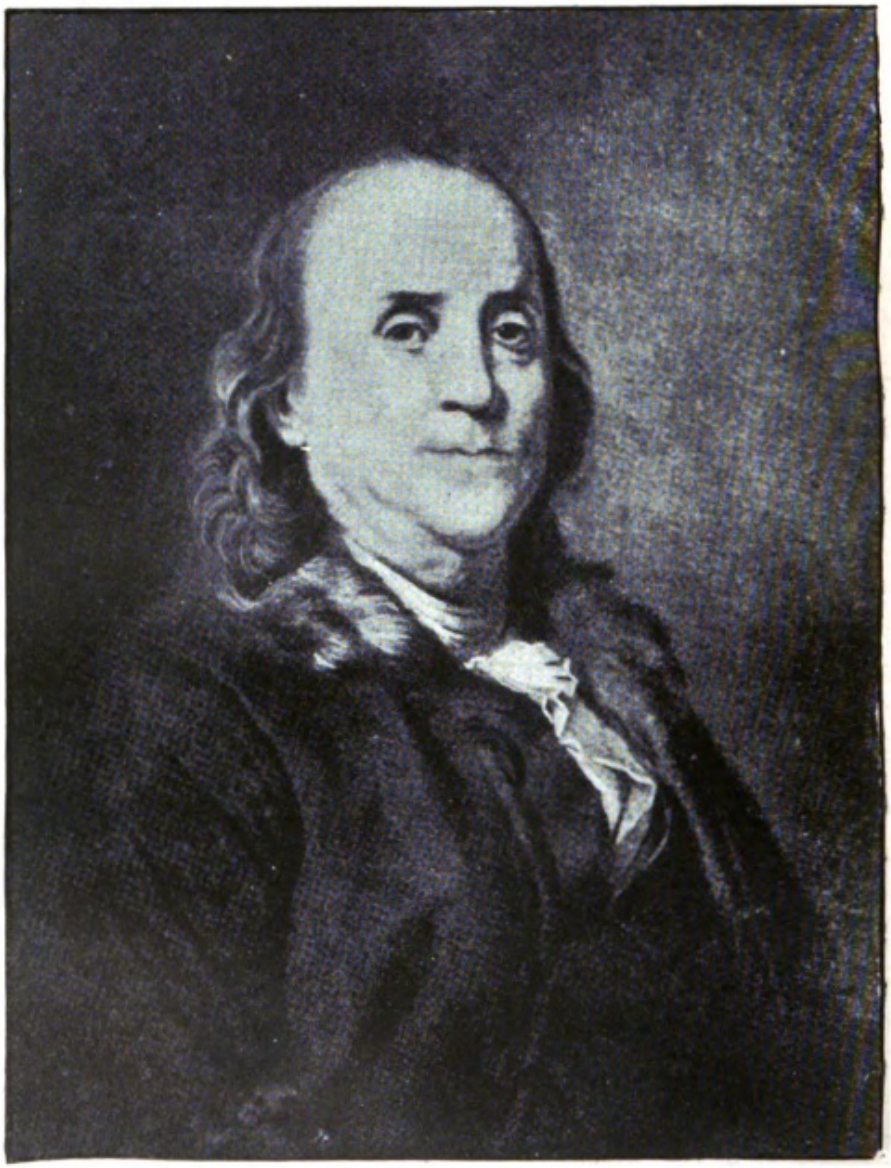

BENJAMIN FRANKLIN

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Duty of Pastor and Teacher in Relation to the Food Subject

Benjamin Franklin achieved an enduring fame in the realms of literature, science, natural philosophy, politics and statecraft. His services to his country are recalled by his organization of the American colonial postal system and his later labors when, as a member of the Continental Congress, he signed the Declaration of Independence, and served his country acceptably and successfully as minister plenipotentiary at the Court of France. Before those exciting and momentous scenes which had their culmination in the Revolutionary War and subsequent independence of the colonies, he had won the plaudits of the world and the profound recognition of the savants of Europe by his penetration of the heavens, by discovering that lightning is electricity.

But great as is Franklin's fame in these separate fields of human accomplishment, not one of them exceeds the renown which is his as a teacher of practical morality and of ways that make men physically, mentally and morally right. Nature's laws early in life became his "darling study," and his interest therein never abated, but rather increased as his mind was broadened and ripened by opportunity for research, travel and observation. First a printer, he quickly developed into an editorial writer and publisher of a newspaper. He was an inveterate writer,

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and he made his newspaper, pamphlet or book a medium for the dissemination of such information as exalted and benefited the physical and intellectual natures of his readers. His daily life was a daily service to his fellow man. He made his own comprehensive understanding of nature's laws easily intelligible to others, and thus won and held public attention. Even in his youth he was filled with schemes for self-regulation and guidance, and he says in his Autobiography that at one timc he even "conceived the bold and arduous project of arriving at moral perfection." In this design he failed, but at once set before him the task of what he styled "acquiring the habitude" of certain cardinal virtues, eight of which are: "First, Eat not to dullness; drink not to elevation. Second, Speak not but what may benefit others or yourself; avoid trifling conversation. Third, Resolve to perform what you ought; perform without fail what you resolve. Fourth, Make no expense but to do good to others or yourself; *i. e.*, waste nothing. Fifth, lose no time; be always employed in something useful; cut off all unnecessary actions. Sixth, Avoid extremes; forbear resenting injuries so much as you think they deserve. Seventh, Be not disturbed at trifles, or at accidents common or unavoidable. Eighth, Imitate Jesus and Socrates."

Franklin projected a "universal creed, which, he thought, contained the essentials of every known religion." There were six articles in this creed, the third and fourth of which were: "That God ought to be worshiped by adoration, prayer, and thanksgiving."

"But that the most acceptable service of God is doing good to man."

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In this last article is disclosed the great principle which actuated Franklin's life. His daily effort was to better the condition of mankind, and his methods were intensely practical, and became popular because they were practical. The dominant idea of his words, written or spoken, was that of plain common sense, and to this day the literary critics say, "Read Franklin for common sense." His series of "Poor Richard's Almanac" quickly gained a national reputation which has endured to this day. Its success was because of its merit as an educator, both to the individual and the community. Its pages were dotted with short, pithy and effective sermons in the form of wise laws, proverbs and bits of homely advice that appealed to the hearts and reason of his readers. Each succeeding annual almanac of "Poor Richard" was read and conned by the colonists, and down through the eighteenth, and well into the nineteenth, century, the laws and proverbs of Franklin were repeated by parents to their children and by teachers to their pupils.

The wisdom of Franklin's doctrine as expounded in the pages of his almanac, and which appealed to his hearers with a force that survived for generations, may be illustrated by such sayings as "Eat to live, and not live to eat"; "I saw few men die of hunger, of eating, 100,000"; "Many dishes, many diseases"; "No man e'er was glorious who was not laborious"; "If you do what you should not, you must bear what you would not"; "Timbs was so learned that he could name a horse in nine languages, so ignorant that he bought a cow to ride on"; "A full stomach is the mother of all evil."

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Not limiting his counsel as to the wisdom of a judicious dietary, to short, homely sayings, of which those given are examples, Franklin originated and published a code or set of rules for eating, and advocated their acceptance in an argumentative appeal to the people. The code he sent out closes by the following plain-spoken, comprehensive and emphatic words: "A sober diet makes a man die without pain; it maintains the senses in vigor; it mitigates the violence of the passions and affections. It preserves the memory, it helps the understanding, it allays the heat of lust; it brings a man to a consideration of his latter end; it makes the body a fit tabernacle for the Lord to dwell in; which makes us happy in this world, and eternally happy in the world to come, through Jesus Christ our Lord and Saviour."

In this last quotation is not only a sermon worthy of any religion, a dissertation that would do credit to any moral philosopher, but it is a complete foundation upon which to rear and justify the most elaborate exposition of domestic science. Its writing shows that Franklin was a profound student of human life, and rightly judged and correctly classified the agencies that work to the production of the ideal physical, intellectual and moral man. As the basis of all these desirable conditions, he placed the rightful selection and use of food. His arguments in support of his position have never been controverted, nor can they be, for his conclusions were based on truth and reason. At this point it ought to be said, perhaps, that many of the sayings of Franklin were not strictly original with him, but were taken from the Proverbs of Solomon, from other books of the Bible, and from the

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writings of the ancient Greek philosophers. Franklin acknowledged this himself, but the knack of serving these up in a style to suit his times was all his own, and he was, therefore, none the less a great teacher.

There must have been occasion for Franklin to write what he did respecting the relation of food to the health and well-being of man, or otherwise he would not have so persistently taught this doctrine. Philadelphia was, in the middle of the eighteenth century, a very rich city, as wealth was gauged in those days, and its trade with foreign countries gave its people opportunity to procure kinds of food that were not accessible to most of the other colonists. That there was lustful eating in Philadelphia in Franklin's time is shown by the testimony of John Adams of Massachusetts, and recorded in his diary after a visit to that city. After dining at the home of a young Quaker lawyer, he writes: "This plain Friend with his plain but pretty wife with her thees and thous, had provided us a costly entertainment: ducks, hams, chickens, beef, pig, tarts, creams, custards, jellies, trifles, floating-islands, beer, porter, punch, wine, and a long etc."

This dinner Adams characterized as "a most sinful feast."

Franklin saw the evil of such living, and he set about a reform that he maintained to the end of his life. He sounded the alarm in such ringing words as these: "Who dainties love, shall beggars prove"; "Nine men in ten are suicides"; "Wouldst thou enjoy a long life, a healthy body, and a vigorous mind, and be acquainted also with the wonderful works of God? Labor in the first place to bring thy appetite into

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subjection to reason." The biographers of Franklin tell that his teachings bore fruit in making Philadelphia the home of frugality, sobriety, and "forehandedness." The principles inculcated by Franklin possessed a value because they were practical. Men could understand them and could perceive the good that was sure to result from their adoption. Since the world began, simplicity of preaching, teaching and eating has been the great factor in its advancement. The strength of Franklin as a teacher and the secret of his success are to be found in the directness and simplicity of his lessons and methods. The great mass of humanity never cared for abstruse reasoning. Franklin dealt with plain, every-day facts that enter into everyone's daily life, and he became beloved and trusted by the people. His philosophy was the truth, sincerity, and integrity of the daily life of mankind, and the world has always been willing to listen to just such men and teachers. The world has furthermore always stood in need of just such men with just such missions, but never more so than in the first years of the twentieth century. But where are the Franklins in this country to-day with its teeming seventy-odd millions of human souls?

In view of the many divine injunctions respecting the proper diet of man found in every book of the Bible, it is strange that there should be so little pulpit presentation of these lessons. Most men look upon eating as a commonplace affair and are inclined to give little heed to any word regarding it, but the minister and the teacher should be all the more persistent and zealous in this work of enlightenment. The hope of the twentieth century, so far as our country is concerned, lies in

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the proper nourishment of its people, but more especially its children. The Bible teaches, and Franklin learned the lesson, that proper food "makes the body a fit tabernacle for the Lord to dwell in." Then why not proclaim this truth from every pulpit in the land? Why not permit the teaching in every church vestry of what are proper foods for man and the methods of their preparation? The evil in man cannot be legislated out of him, but it can be fed out of him. On the score of economy alone the State can do nothing better than to provide means for the dissemination of the simple truth, that naturally organized foods make possible natural conditions. Someone has said that Franklin's success was owing to the fact, that he made the most of himself. It would be difficult to understand how anyone could possibly attain the success Franklin did except by making the most of himself. But the grand, resplendent feature of Franklin's versatile career is his service to his fellow man, and in no one particular did this service make itself more manifest than his teachings respecting the diet of man. None can deny that the need of the day is for more Franklins. The physical degeneracy of the American people is too great and too general to be lightly thought of. Already we are well-nigh a toothless people, and ours is a land of dentists, druggists, and medicine manufacturers. This means that we are afflicted with "sore sickness," as was that people of old, and for the same reason—the eating of improper food. Crime and immorality of every kind and degree are rampant, and the numbers of destitute poor are startlingly large. These undesirable conditions did not exist in the first half of the nineteenth

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century, but have mostly come upon us during the past forty years. Instead of the robust, stalwart and healthy race of men and women that lived in New England fifty years ago, we see to-day a people approaching the opposite of these. We know that there was a radical difference in the foods of the two periods. In earlier time the foods were much the same as nature made them, while in the latter, man in his attempt to improve upon nature's work produced a disorganized mass, and the result to the consumer was unnatural conditions. As the American people enter the new century these unfavorable conditions flourish to an extent that is appalling.

"I grew convinced," wrote Franklin in his Autobiography, "that truth, sincerity and integrity in dealings between man and man were of the utmost importance to felicity of life; and I formed written resolutions, which still remain in my journal, to practice them ever while I lived." There is no truth in an adulterated food, no truth in eating and drinking unworthily, no truth in feeding the body with foods that nourish only in part; and that minister who fails to preach these truths and the teacher who fails to teach them omit to perform a plain duty.

As Moses led the children of Israel out of Egypt on towards the Promised Land, the kinds of foods they were to eat were made known to them by their divinely appointed leader. Particularly is it significant to note that the Israelites were forbidden, under the most direful penalties, to eat the kinds of foods which at that time most obtained in Egypt. On various occasions the Israelites disobeyed the laws respecting the foods they were to eat, and living as

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did the Egyptians there was meted out to them punishments in the form of plagues. The Israelites were selected to be a chosen people of God, and one of the first and all-important means named for the fulfilment of this purpose was the promulgation of statutes and ordinances respecting their diet and the proper management of their domiciles. All historians agree that the Israelites in the times of the patriarchs were a magnificent people, physically, mentally and morally. The only people that have approached them in these respects in modern times were the Puritans of New England and their descendants down to the beginning of the nineteenth century. All these peoples lived, in the main, upon naturally organized foods, and history teaches that the nature of the foods people eat determines the measure of their strength and success in the fields of human effort.

Naturally organized foods were the portion of the men who built this nation, but the example set by these men is no longer followed by the great mass of their descendants, and the harmful results are plainly seen in almost every phase of American life. We enter the twentieth century utterly unmindful of the precepts and teachings of the fathers.

Benjamin Franklin believed and taught that a great source of virtue was in feeding the body upon naturally organized foods. So emphatic was he in this teaching that he declared that "he who lives well is learned enough," and he meant by his saying that "there was never a good knife made of bad steel" that there was never a good man made of bad food. Franklin was supported in his contention by the fact

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that a people were never great, never strong, except through the use of naturally organized foods.

Still another honored founder of the American nation who sought to inculcate the wisdom of proper living, and taught it by precept and example, was Thomas Jefferson, author of the Declaration of Independence, and third President of the United States. Jefferson all through his life was, practically, a vegetarian. In a letter written at the age of 76 years, he says: "I have lived temperately, eating little animal food, and that not as an aliment so much as a condiment for the vegetables, which constitute my principal diet. I use spectacles at night, but not necessarily in the day, unless in reading small print. My hearing is distinct, and I have not yet lost a tooth."

Jefferson, like Franklin, died at the age of 84, and his grandson, Jefferson Randolph, in writing of his appearance and manners, said: "Dying in his 84th year, he had not lost a tooth nor had one defective. His stature was commanding, six feet two and a half inches, well formed, indicating strength, activity, and robust health; his carriage erect, step firm and elastic, which he preserved to his death; his temper, naturally strong, under perfect control; his courage cool and impassive. No one ever knew him to exhibit trepidation. His habits were regular and systematic. He said in his last illness that the sun had not caught him in bed for fifty years. He always made his own fire. He ate heartily and much vegetable food. He never drank ardent spirits or strong wines. *He held* in little esteem the education which made men ignorant and helpless as to the common necessities of life."

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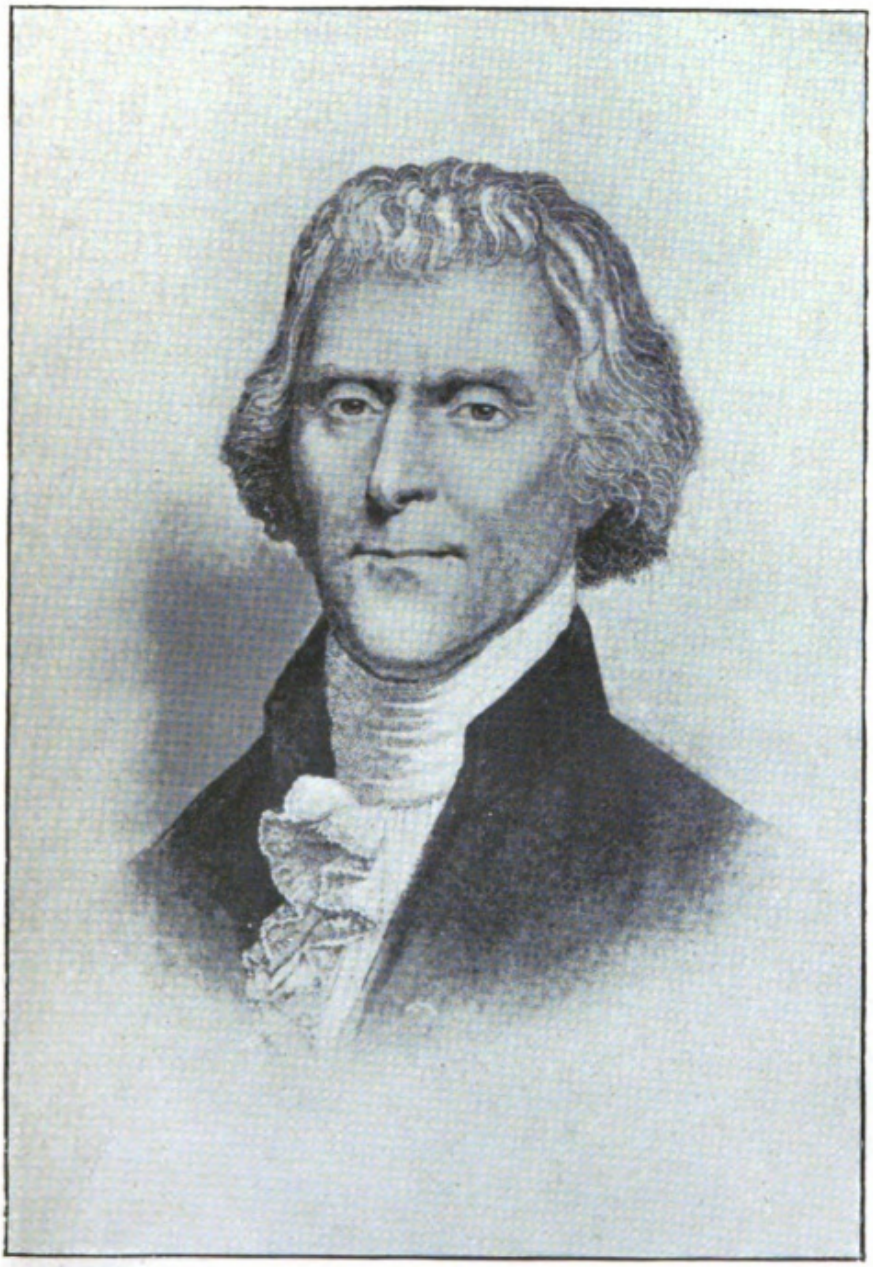

THOMAS JEFFERSON

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Jefferson labored zealously all through his busy life for the upbuilding of an American system of education which would teach men how to live in accordance with the laws of nature.

In all the teachings of the Old Testament, the care of the body was enjoined, in many ways set out under the form of religious duties, such as purifications and fastings, rules of sanitation and diet—duties which are observed with the greatest strictness by the members of the Jewish Church to this day. Moses, and after him, the priests of Israel, did not confine themselves to counsel or advice in these matters, but they commanded the observance of the rules and regulations laid down in the Mosaic law.

The Jews were taught to regard sickness as a punishment for deviation from the religious law in that regard. Good health was therefore a divine blessing, which they received as the daily consequence of their obedience. Regimen was enforced in a mandatory manner, and the Jews were a hardy and strong people, and are now regarded as exceptionally healthy and long lived.

In other religions, similar observances in the form of fasts and washing-rites are found, together with regulations in regard to the kind of food which is, or which is not, proper for man to eat, from a religious point of view. In primitive times as now, trouble came to those whose business it was to look after the weak ones of the community, chiefly in the shape of their hunger or of their sickness. A sick person or a weak person cannot do his part in the social system, or in a religious way, and the law-givers who were in those days the priests used

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the authority given them to promote the health of the people. The observances of the Greek Church are manifested especially in the way of fasts and ablutions. Also in the Latin Church such observances are commanded. The religion of the Brahman is replete with these rites, as is also that of the Mohammedan.

Is it not apparent, then, that the office of the preacher—the one who ministers to the spiritual needs of this imperfect being—is to teach him not only doctrine and forms of obedience, but also the way of bodily health and life?

Most people regard the blessing of good health as a consequence of a "good constitution", or "abstemiousness" or other good habit, and take little pains to preserve it; while if they were taught by their pastor or minister to look upon it in a religious way, their care of it would appear in the light of a sacred duty, not liable to be neglected. To the extent one's health is impaired so is his power to do his full duty to his fellow man impaired.

The priests of other religions recognize the potency of such ministrations, and are, in great part, even more strict in regard thereto than to matters of doctrine. The habit of the body becomes in time of itself a tie to the church, when such habit is brought about in the form of a religious duty, and as it is attended with marked beneficial effect on the health, the bond is very close.

Neither Franklin nor Jefferson was an atheist, as some may imagine, but both, and particularly Franklin, criticised the ministers and churches of their times because they did not show enough of the "workside" of life. Franklin held that what he taught respecting

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the diet of man in his almanac, the ministers should do in their pulpits, because such led to morality. It was the Franklin idea of spreading the gospel.

In the Bible are many passages which indicate the authority used in matters relating to the health of the people. From them have been selected some which would serve for texts as a basis for ministerial action.

BIBLE REFERENCES TO THE FOODS OF MAN.

Genesis 1: 29:

And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat.

Psalm 147: 14:

He maketh peace in thy borders, and filleth thee with the finest of the wheat.

I Kings 5: 9, last clause:

And thou shalt accomplish my desire, in giving food for my household (King Hiram of Tyre's appeal to Solomon).

I Kings 5: 11 (Solomon's response to above appeal):

And Solomon gave Hiram twenty thousand measures of wheat for food to his household, and twenty measures of pure oil; thus gave Solomon to Hiram year by year.

Job 20: 14:

Yet his meat in his bowels is turned, it is the gall of asps within him.

Proverbs 13: 23:

Much food is in the tillage of the poor; but there is that is destroyed for want of judgment.

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Proverbs 12: 11:

He that tilleth his land shall be satisfied with bread; but he that followeth vain persons is void of understanding.

Proverbs 13: 25:

The righteous eateth to the satisfying of his soul; but the belly of the wicked shall want.

Genesis 47: 12:

And Joseph nourished his father, and his brethren, and all his father's household, with bread, according to their families.

Genesis 47: 23, 24:

Then Joseph said unto the people, Behold I have bought you this day, and your land for Pharaoh: lo, here is seed for you, and ye shall sow the land.

And it shall come to pass, in the increase that ye shall give the fifth part unto Pharaoh; and four parts shall be your own, for seed of the field, and for your food, and for them of your households, and for food for your little ones.

Leviticus 19: 23, first clause:

And when ye shall come into the land, and shall have planted all manner of trees for food.

Nehemiah 9: 20, 21, 25:

Thou gavest also thy good Spirit to instruct them, and withheldest not thy manna from their mouth, and gavest them water for their thirst.

Yea, forty years didst thou sustain them in the wilderness, so that they lacked nothing.

And they took strong cities and a fat land, and possessed houses full of all good, wells digged, vineyards, oliveyards, and fruit trees in abundance: so they did eat, and were filled, and became fat, and delighted themselves in thy great goodness.

Proverbs 30: 8:

Remove far from me vanity and lies; give me neither poverty nor riches; feed me with food convenient for me.

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Isaiah 7: 15:

Butter* and honey shall he eat, that he may know to refuse the evil, and choose the good.

Ezekiel 16: 13:

Thus wast thou decked with gold and silver; and thy raiment was of fine linen, and silk, and broidered work; thou didst eat fine flour (not bolted or fine as the people of this day understand the word), and honey, and oil; and thou wast exceeding beautiful, and thou didst prosper into a kingdom.

Genesis 43: 11:

And their father Israel said unto them . . . . . take of the best fruits in the land in your vessels, and carry down the man a present, a little balm, and a little honey, spices, and myrrh, nuts, and almonds.

Deuteronomy 14: 3:

Thou shalt not eat any abominable thing.

Deuteronomy 12: 32:

What thing soever I command you, observe to do it; Thou shalt not add thereto, nor diminish from it.

Daniel 1: 8:

But Daniel purposed in his heart that he would not defile himself with the portion of the king's meat, nor with the wine which he drank, therefore he requested of the prince of the eunuchs that he might not defile himself.

Deuteronomy 34: 7:

And Moses was an hundred and twenty years old when he died; his eye was not dim, nor his natural force abated.

Joshua 5: 11:

And they did eat of the old corn of the land on the morrow after the passover, unleavened cakes, and parched corn in the self same day.

***Butter of Bible times was curdled milk.**

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Numbers 11: 33:

And while the flesh was yet between their teeth, ere it was chewed, the wrath of the Lord was kindled against the people, and the Lord smote the people with a very great plague.

Proverbs 23: 20, 21:

Be not among winebibbers; among riotous eaters of flesh, for the drunkard and the glutton shall come to poverty; and drowsiness shall clothe a man with rags.

Proverbs 23: 1, 2, 3, 6:

When thou sittest to eat with a ruler, consider diligently what is before thee.

And put a knife to thy throat, if thou be a man given to appetite.

Be not desirous of his dainties; for they are deceitful meat.

Eat thou not the bread of him that hath an evil eye, neither desire thou his dainty meats.

Ezekiel 4: 14:

Then said I, Ah Lord God! behold, my soul hath not been polluted, for from my youth up even till now have I not eaten of that which dieth of itself, or is torn in pieces; neither came their abominable flesh into my mouth.

Exodus 23: 25:

And ye shall serve the Lord your God, and he shall bless thy bread, and thy water; and I will take sickness away from the midst of thee.

These passages are not without weight in their indication of the special forms of food which were regarded best for the Jewish people.

In the Old Testament a pointed lesson is found in the book of Daniel, in the story of the children of Judah, who prevailed upon their Egyptian friend, the

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steward Melzar, to let them eat pulse instead of feasting on "the king's meat." Whereby, when they came before the king, they were found "healthier than those who did eat the king's meat," and "ten times better, in all matters of wisdom and understanding, that he required of them, than all the magicians and astrologers that were in his realm."

In eastern countries, nothing is known of the "fictitious distinctions which prevail among us between sanitary regulations and religious duties, but the one as much as the other is considered a part of the great system of obligation under which man lives toward God. What, therefore, health demands, religion is at hand to sanction. Cleanliness is in consequence not next to godliness, but is godliness."

In these countries the diet has been in all ages light and simple. Compared with our own habits, the chief points of contrast are found in the small amount of animal food consumed, the extensive use of the fruits, the variety of articles used as accompaniments to bread, and the substitution of milk in various forms for our liquors. They have always been very sparing in the use of animal food. Aside from religious reasons, heat soon renders it unwholesome, and it is to them very expensive.

The religions which have to do with the habits of the people in an authoritative way, include a great part of the population of the world. We are informed that the Christians of the Latin and Greek churches are about 300 million; of the Jewish church, 8 million; of the Mohammedan, 150 million; of the Brahman, 220 million; of the Buddhist, 200 million, and of the believers in Confucius, 200 million.

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The Protestant Christian churches do not regard sanitary observances as a part of their cultus, and they number only 140 million bodies, which are for the most part wanting in proper health—if we judge only from the number of drug-stores and physicians supported by them.

Luke 9: 2:

"And he sent them to preach the kingdom of God and to heal the sick."

This is what the great Exemplar said to His disciples whom he "sent" to preach, and we may assume that no more important duty was ever assigned to man. Another great work is found in the teachings—in fact mandatory directions—of Moses in commanding obedience to the dietetic laws of the land. The first, contemplated a work of help and mercy to the afflicted, while the latter contemplated obedience to the law—to live in harmony with which meant to be free from the afflictions which beset mankind. The preacher of to-day does not heal the sick, because his religion is mainly formal and theoretical; nor does he teach the law of diatetics as did Moses. In both instances he fails because he lacks the understanding, and he lacks the understanding through no fault of his, for he is but the product of some great university or educational institution which has licensed him to preach. All man is, is what he is educated to be, and the burdens of mankind in this age are mainly due to the accumulated errors of the ages gone by, transmitted and perpetuated with increasing ratio through the medium of the educational institutions of our country. While the preacher is enjoined to heal the sick, it is a fact that a great deal of his time is given to

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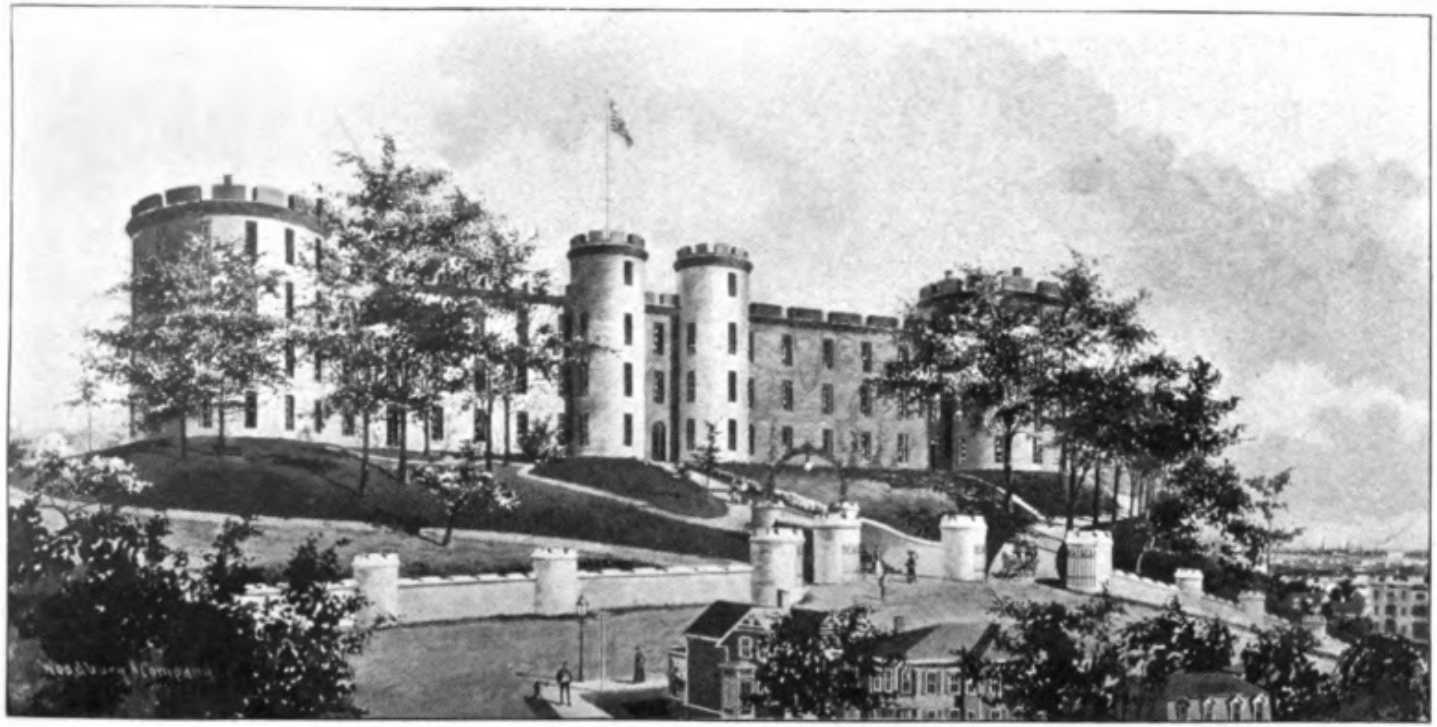

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preaching funerals of the prematurely dead, whereas had he "healed the sick," or had he taught the true domestic science of Moses, the occasion for burying one-third of all the children born under 5 years of age would not have come to cause the grief of bereaved parents; and the preacher would have been spared the further perpetuation of the error, if not offense, of declaring that the Lord had called these little ones away from heartbroken parents for some good and wise purpose.

It is a lamentable fact that the religion of today is too much like the food man has, for both are unsatisfying, and this is true for the same cause—each is but part of the perfect whole. The preacher gives us a part of the perfect Christianity of Christ, or adulterates it with some notion of his own, while the food-products of the tiller of the soil, perfect because a part of creation, are made unsatisfactory by disintegration, separation, disorganization and adulteration. No doubt the plan whereby man may be a man in fact, is right, and that abundance of material out of which to build him according to the plan is vouchsafed to him. How the preacher can escape preaching to his flock these truths and still accept the Bible as his text-book, is one of the problems it would be well to seriously consider. Were the A B C of proper food and a true domestic science taught in the schools of our country along with the A B C of our language and up through all branches, the handicap which now intervenes to prevent man being what he was intended to be would be removed. All this may be accomplished through a proper educational system. What we need in this country is relatively less book knowledge, less

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theory—and more intelligence, more of the practical. To-day we have too much knowledge. All knowledge is power; but power for good or for evil relatively as one has or lacks intelligence to direct the use of and enjoy this knowledge. The more knowledge one has, if unaccompanied with the intelligence to utilize it in the interest of mankind, the more dangerous is the possessor to society.

The schools, colleges, universities, and other educational institutions of the country can not escape responsibility for existing conditions. All a man is, is what he is educated to be. Man is built out of the material—food—he is, because that is the way he is educated. If his is an inharmonious structure with the propensities for wrong-doing, it is because that is the way he is built, and he is built out of the food he eats, and he eats what he does because that is the way he is educated. The preacher, like the prisoner in jail, is but a product of our educational institutions, in which both have been handicapped in the attempt at development of the real man—the highest expression of Supreme Intelligence.

We are not unmindful that the teacher is also a product of our educational institutions, and this suggests great difficulty, it would seem, in the discovery of a remedy. But the potency of truth is great. Error must yield when an earnest and intelligent effort is made. The remedy lies in a healthy public sentiment, which in great emergencies like these is best created through the homes—the mothers: Women are always responsive under such conditions if properly appealed to, and we have much to hope for through the mothers of the country. Both the teacher and the preacher may

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agitate the question with great advantage, and with concert of action accomplish much good. May we not suggest that every month the ministers preach from one of the many good texts found in the Bible on the food subject, or on domestic science generally, and insist on turning his church vestry into a cooking school? This would be practical Christianity, and the good fruits of such work would be appreciably felt throughout the land.

That there may be no misunderstanding as to the product of our educational institutions for which they are responsible, we may here in conclusion, make a brief summary. Statistics show that a large per cent. of all who go into business fail with all attending want, distress and misery, that the country is full of tramps and drunkards, that the jails are full to overflowing, that lunatic asylums decorate our hills, that institutions for the deaf, the dumb, the defective and the blind and halt are increasing, while in the great educational centers, there are more medicine-shops than food-stores, and nearly everybody is more or less sick, that 33 per cent. of our children, in process of building human structures succumb under 5 years of age; and the aged are decrepit, a burden to themselves and friends, taking years to die, instead of enjoying themselves as they should with increasing ratio until they "sleep."

We have not found a minister of the gospel, not one, when this subject was fairly presented to him, who did not agree, at least in the main, to the correctness of our position, and many are now studying the subject with earnestness, while some are preaching this gospel from the pulpits. Many are eager to dis-

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cover the cause of man's many infirmities and why the prayers of the church, in respect to the health of the people, are unanswered. What the world most needs is a practical as distinguished from a theoretical religion, and a natural and therefore perfectly practical food as distinguished from the disorganized stuff which man is compelled to eat in order to satisfy the greed of man whose work in the preparation of food-products amounts to robbing children of their birthright. No man sits down to a meal today without some element of fraud being present, and yet we boast of our great educational and religious institutions.

In respect to food the way is easy. You may accept with perfect confidence the proposition that naturally organized food makes possible natural conditions.

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