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THE FALLACY OF TONICS.

J. H. KELLOGG, M. D.

A SO-CALLED medicinal tonic is nothing more or less than a nerve fooler. It makes a man feel better when he is not better. It stimulates an activity of the nerves which is mistaken for an increase of strength. If men and women really understood the pernicious character of tonics,—that the continued use of them means the ultimate certain bankruptcy of health,—thousands of people might be saved every year from complete physical ruin.

A tonic is a whip. Under its stimulus a man is compelled to do more work than he has the spontaneous ability to do. When a person feels that he is all tired out and that his nerves are weak, and asks his physician for a tonic, it is the same as if, when his faithful horse shows signs of weariness, he should say to his neighbor, "Come and whip this horse for me. Get a rawhide or a goad,—anything that will make him work." Many a fine horse, under the sting of the whip, has been spoiled in twenty-four hours; and many men and women, under the stimulus of tonics, have been spoiled for life in one season of business stress or social dissipation.

Fashionable people who come home from summer resorts in the autumn with rosy cheeks and snapping eyes and plunge into the whirl of society, often find their strength failing at the height of the season. The bloom is gone from their cheeks and the sparkle from their eyes. They go to a doctor for a tonic. The business man, in the rush of the winter trade, begins to find himself lagging behind. His brain refuses to do the work necessary if he would keep up with his competitors. He goes to the doctor for a tonic. The teacher, in the midst of the winter examinations, feels that it is impossible to bear the routine another minute. She goes to the doctor for a tonic. Physicians are constantly beset by the entreaties of the people for something that will spur up their flagging energies.

If strength and energy could be concentrated into pills, what a convenient power we should have with which to run trains of cars or mills, to dig mines, to pull wagons over mountains. Such an idea is the sheerest nonsense. There is only one source of energy in this world for man, and that is food. He must get energy from the same source that the engine does,—from food, *i. e.*, fuel. You would not expect to increase the power of an engine by putting some little strychnia or quinine pills into it. From a physical standpoint the human body is simply an engine,—a machine for taking the energy of food and converting it into the energy of muscle, brain, and gland.

In taking sugar-coated "tonic" pills, a man derives just as much benefit as there is in the coating, and just as much harm as there is stimulus in the tonic. Why do

the pills do mischief? Because it is not the design of nature that man shall be able to exhaust his supply of energy. It is as if the energy of our bodies were stored in a tank, the outlet of which is toward the top instead of near the bottom. This special provision has been made so that it is impossible for us to run our tanks dry. We can not get all the energy out of our bodies, no matter how hard we work. When the tank is full, we feel the joy of living. We are able to supply ample power to the wheels of the machine. But if the water sinks in the tank, it flows with less and less force, the wheel turns more and more slowly, and when the water reaches the level of the wheel, it ceases to flow and the motion stops. This is exactly the provision that nature has made for us; our activities should stop before our store of energy is gone and the tank is empty.

There are a great many wheels to be fed by this current of energy,—the brain wheel, the heart wheel, the lung wheel, the stomach wheel, the liver wheel, the muscle wheels, and various others. All these wheels are run by pipes that tap the tank in different places. If the heart wheel drew its energy from the same point as the brain wheel, then, if the brain were overworked, we might use up so much power that the energy could not run the heart work. So with the muscles. If the muscles could draw upon the store of energy to the same degree that the heart can, we should soon exhaust the power that supplies the heart, and it would cease to beat. Nature has provided that the voluntary activities shall cease long before we reach the point at which the heart and lungs would fail. When our energy is consumed down to a certain point, we can not control it further. It is as if the brain were the dynamo of the body. Every brain cell is a little storage battery. It has numerous tiny filaments, or fingers, by which it communicates with other cells. In consequence of the expenditure of the energy in these cells, the nerve fingers are retracted to such a degree that they pull apart; the cells shrivel and shrink, and nature demands sleep. When the fingers separate completely, the current is broken, consciousness is gone, we are asleep. Then our vital tanks begin to fill up, and the stores of energy are gradually replenished from the food we have eaten. It is by assimilation that the food is deposited in the blood, causing a replacement of the energy in the cells.

What does all this have to do with tonics? What is the effect of a tonic? It adds nothing to the store of energy in the tank. It deposits no energy granules in the nerve cells. It can not in any way replenish energy to the slightest degree. This is what it does—it enables us to tap our tanks a little lower down. It irritates the nerve cells, rendering them more sensitive, so that they are more ready to throw off their energy. The consequence is that, under the influence of the tonic, a nerve cell that ought to have perhaps five hundred granules may be reduced to one hundred. A larger dose of the tonic may make it possible to squeeze out fifty more, to strain the cell, and compel it to throw off more energy than it can afford to lose, possibly to throw off so much that it can never build itself up again.

An illustration in point is the case of a man whom the writer knew, who was persuaded to take a powerful medicine that was guaranteed to cure every kind of stomach trouble, without loss of time in taking treatment, and without attention to diet. The first dose was taken after a heavy dinner, and did compel the stomach to digest it. The man was so pleased to think he could eat what he wanted and not suffer afterward, that he took the medicine to his physician, vaunting its

AS ANIMALS EAT, SO ARE THEY.

wonderful properties. The physician examined it and found that it was a double distilled extract of cayenne, capsicum, mustard, and pepper. It was simply a tremendous whip. It forced the stomach to digest foods that it was not able to digest. But that was the last meal this man's stomach ever digested. The next day he took a second dose of the medicine, and it set up an inflammation of the stomach that in a few weeks caused his death.

This man's experience was perhaps unusually severe, but it was the same in kind as that of thousands of others. The reaction is always equal to the stimulus. What is tonic to-day is inadequate to-morrow. The size and power of the dose must be constantly increased, just as the horse must be whipped harder and harder to get the same amount of speed. The man who goes to a new doctor and tries a new kind of tonic, is simply getting a new kind of whip that excites and irritates him in a different way from that to which he has been accustomed. By and by he exhausts the last resource, and then he is told that he has "nervous prostration or nervous exhaustion." That is exactly the case. His nerves have been exhausted.

What the tired man, the man whose nerves are worn out, needs, is physiological rather than pathological treatment. He needs, not to be "*toned* up," but to be *built* up, to be charged with more energy. Tonics not only drain the system of its vital reserves of strength instead of renewing its vigor, but they are also poisons. The better the tonic, the worse the poison. There is no such thing as a harmless tonic. If it were nothing else that is bad, it would always be a deceiver. It makes the weary business man think he is strong and vigorous, so that he goes on toiling, toiling, long after he ought to have had a vacation, until he is past all permanent benefit from any rest or treatment. The tonic simply hides from him the fact that he is weak and nervous, and that his store of energy is low; but his best interests demand that he know the truth, that he stop turning the wheels so fast, and let his store of energy accumulate. Those who go on recklessly until every vital organ is out of repair, fall into the condition patly described by the man who declared that what he needed was "a whole new set of works." There was nothing good left but the case. The doctors must put in a new pair of lungs, a new stomach, a new liver, a new heart.

But all this takes time. It is like tearing down a house and building it over while still living in it; pulling out one old brick at a time, and replacing it by a sound one; taking out a bad wall here and putting a new wood work there, until the entire edifice is reconstructed. This is what Swedish movements, electric baths, massage, diet, and all the different rational treatments prescribed for chronic invalids, are able to accomplish. They rebuild and renew the body. Rational treatment aims to cure the patient, not his malady, in the knowledge that if the patient is cured, his disease will vanish away, and he will need neither tonics nor medicines of any sort.

THE CAMPAIGN IN THE TROPICS.

FELIX L. OSWALD, M. D.

III.

THE siege of Santiago has furnished a long-desired opportunity to study the effects of long-range rifles, and the reports of General Shafter's surgeons incidentally elucidate several important points of the germ theory of disease, including a fact which bids fair to become the corner-stone of the medical science of the future; viz., the circumstance that microscopic parasites can be lethargized, or even permanently destroyed, by appliances which the human organism can resist with ease.

COUNTRY ROAD NEAR HAVANA.

As a rule, the danger of gangrene, for instance, increases with the degree of temperature, and it was feared that under the burning sun of the tropics every scratch would fester, and severe wounds prove far less curable than in the higher latitudes; but the antiseptic contrivances of modern surgery more than counteracted that difficulty. Even saber cuts and "scrape shots," lacerating surface tissues in a manner to give septic germs a perilous chance, healed readily, in spite of a temperature often exceeding a hundred degrees Fahrenheit in the shade. Inflammation was kept at a minimum, and very few fatal issues of more severe injuries were reported in cases where circumstances permitted prompt surgical attendance. Antiseptics and poisons, it is true, are almost synonymous terms; but the risk of their application to open wounds seems to be diminished by nature's efforts to protect injured tissues by a non-organic tegument — a surface film of coagulated blood, that coöperates with the palliating effects of medicated bandages.

Minute traces of morbid matter may nevertheless get absorbed in the circulation, and the fever which generally accompanies the first reaction against serious wounds, appears to lessen the injurious tendency of drastic drugs, just as the fever strug-

gle against such blood poisons as the virus of serpents and venomous insects, makes the system for a while almost alcohol proof.

In the military hospital of Medellin, near Vera Cruz, I once caught one of our Mexican assistants plastering a flayed man with handfuls of common kitchen salt. The patient, a young half-breed, employed in the quartermaster's department, had been thrown by a vicious mule and dragged by the stirrup-strap through a thicket of prickly-pears (the tunas cactus) that had horribly scratched his left side from the shoulder to the ankle of his naked feet, and would have torn off his face like a mask if the plucky fellow had not kept his grip on a midway buckle of the strap. The parts of his body that had come in contact with the thorns were ripped almost to the bone, and these wounds the local expert was now padding with chlorid of sodium.

CATHEDRAL IN HAVANA.

"Say, steward, are you not torturing that man?" I asked. "Ask him yourself," he replied in Spanish, braving the test of a public discussion, "Say, Joe, have I made things worse for you?"

"I did think so, first," said the patient, "but I declare, I feel all numb now; I'm glad *now* I didn't let that mule get away."

Such microbes as might have tried to effect a lodgment in his sores did not get away, either; they had all been pickled beyond the hope of resurrection, and the inflammation soon subsided.

Two years ago a French physician reported his success in curing dyspepsia and chronic catarrh by inhaling the preternaturally cold air in the chemical vault of an ice factory. The prescription seemed a little heroic, but was as strictly rational as the specific of my Mexican colleague: the catarrh microbes succumbed to a remedy that did barely affect the comfort of the respiratory organs; and I will here venture the prediction that within fifty years inhalation of artificially cooled air will have been recognized as the panacea for lung diseases.

When the highly improved small-caliber repeating rifles were generally adopted by the militant states of Europe, it seemed doubtful if the innovation would tend to make war more murderous. The old surgeon-general of the Austrian army thought it would, while a staff officer of Marshal Canrobert emphatically dissented from that opinion. "The little projectile," he said in a communication to the *Revue de Deux Mondes*, "will serve its purpose

with the least possible amount of permanent damage; it will temporarily disable a soldier — disqualify him from fighting for the rest of that day or campaign — without endangering his life. He may live to fight some other day, but before that time the swift methods of modern warfare will have decided matters and the victor will be none the worse for having failed to diminish the population of the enemy's country to an exasperating degree. The very velocity of the improved bullets operate in the interest of mercy; they pierce a human body as they would pierce a pane of glass, clean and without splinters, and obviate the trouble of surgical operations."

CUBAN SENTINEL.

But the reports from Cuba appear to imply that the Austrian veteran may have been right, after all. At short range, it is true, the bullets of a Mauser rifle perforate human bones with an ease and dispatch that simplifies remedial operations. From a distance of two hundred yards the sharp-pointed projectile (just about the diameter of a cigarette and half the length) will pierce a four-inch plank of hard oakwood in a line of transit as straight as an augur hole. But its range of flight varies from two to three miles, and a "spent bullet" at last ceases to obey the rotary impulse of the rifles; it begins to whirl, and striking lengthwise, may inflict as ugly a wound as the bolt of the clumsiest medieval crossbow.

And then no earthly joys are ever unalloyed, and the pleasure of a "clean, straight perforation" is somewhat modified if the bee-line of transit happens to take in the lungs or the stomach.

As a net result of the change from muzzle-loaders to magazine rifles the percentage of fatal shots has without doubt been considerably increased.

About the more horrible destructiveness of improved bomb-shells there has been no question whatever. With telescope sights and ingenious methods of adjustment the target practise of the gunners has been brought to a marvelous degree of perfection, and the fragments of an

exploding shell are hurled about with a violence unknown to the artillerists of the Napoleonic campaigns.

The Spanish gunners, both of the armada and the harbor forts, blundered miserably, but Spain would have held out for better terms if it had been known how promptly the climate would answer her prayers for an interceding ally. About the end of July, *i. e.*, less than two months after the landing of the first invaders, the flames of climatic fevers broke out like a smothered fire, and the American public then began to understand the meaning of Colonel Roosevelt's remark that "the early conclusion of the Santiago campaign would save the army from fatal calamities."

Yellow fever, it seems, had been flickering here and there ever since the capture of Caney, but the fact was wisely concealed, and the Spaniards probably began to fear that the unaccountable champions of Yankeeland might be fever-proof as well as bullet-proof. Events, thus far, had upset all orthodox calculations; eleven good ships, armor plates and all, had been knocked into scrap iron.

But about the middle of July the swamp hags of the West Indies began to prevail against the wizards of the North, and within a week after the surrender of Santiago the commander of the victors admitted the fact that another month of hardships in that hades of mosquitoes and malaria would have turned every U. S. camp into a lazaretto. And it was perhaps more than an accident that soon after a hint on the real state of affairs, the Spaniards expressed the hope that the conquerors would decide to annex the island of Cuba, rather than leave it in the hands of the semi-barbarous insurgents. If the Madrid patriots could have induced Americans, of all races, to chase each other through the fever swamps of Pinar del Rio, they could have left this world content, satiated with the sweets of vendetta. The rainy season, indeed, had set in a few weeks earlier than usual, but the real tug of war against the fever would have begun in September, when the rain-soaked coast forests reek under the glare of returning sunshine.

At that time, too, the harbor towns are visited by spells of *ahogassos*, or sweltering weather, whole days, or still oftener nights, without a breath of life-air and with a temperature ranging from Turkish-bath heat to up above the fever point.

The naturalist Buckland mentions a British skipper who bought a dozen ferrets to rid his ship of rats; then tried traps, and all sorts of poison; but at last hit upon a more effective expedient. After removing all the perishable portions of his cargo, he pumped the hold of his cutter full of superheated steam, and that time the rodents did recognize the advantages of a general exodus. They came darting out of every aperture, squeaking and bristling with horror; and with a similar suddenness a Cuban *ahogasso* is apt to dislodge the tenants of a boarding-house, and send them swarming up the ladder of the flat roof-top, a sort of skyward fire-escape. But American victims of the night-air superstition might refuse to stir before the arrival of a yellow-fever commissioner or coroner's deputy.

September, thus, is the fever month for all Spanish-America of the northern hemisphere; and about the end of August, wealthy creoles remove their families to one of the numerous upland sanitaria. In Mexico the vast central plateau is considered safe anywhere above an altitude of three thousand feet, and health-seekers can simply change from city to city, passing the winters in Vera Cruz and the midsummer months in aristocratic Puebla or the luxurious metropolis. In Cuba, on the other hand, the great back-

bone range culminates in a sharp crest, leaving little room for tableland towns, and refugees have to content themselves with a sojourn on an *estancia* of some midway glen, or "cove," as our Tennessee mountaineers would call it.

Sportsmen, too, are better off on such hills of refuge; the waters of the rainy season run off as from a roof, and a hunter can venture to camp without risk of being left *exsanguis* by the insect torments of the first bivouac. But for all that the paterfamilias of a native household often prefers to stick to city amusements, allowing the youngsters and females to enjoy country life the best way they can — sometimes till long after the middle of November, when the coast plains are still mildly broiling under the sunlight of a West Indian summer.

Foreigners are mostly advised to join the Sierra-ward migration, but it is no wonder that General Shafter's surgeons, were disappointed in their hopes of relief on the low shore hills of Santiago harbor. Those hills, with few exceptions, are as treeless as those of Velez Malaga, and only about five hundred feet above tide-water. During a calm the heat on those sun-blistered ridges is as insupportable as anywhere in the coast swamps, and in night time, when nature tries to make amends, prejudice-blinded man refuses to meet her advances even half way.

THE LOUVRE IN HAVANA.

The cooling night wind from the Sierra Maestra is felt very early on isolated hills, and three hours after sunset the mercury has generally dropped below sixty degrees Fahrenheit; but long before that time hospital-steward Hearsay has closed down the wind doors of mercy on mankind, and keeps his patients sweltering in the accumulated heat of the tropical afternoon. The cooling showers of the rainy season offer another pretext for the enforcement of the early-closing law, and the refugees

of the hilltops thus come in for all the grievances, without the natural advantages, of their situation.

Much luckier, every way, were the garrisons of the floating citadels, the ironclads and supply ships of the American navy. Throughout the campaign of four summer months, — May being the beginning of the tropical sunstroke season, — our boys in blue flannel kept disease at bay in a surprising manner, and, if the truth were known, even in spite of the aforesaid blue flannel. An artificial tegument of wool is an absurdity in the neighborhood of the equator. The men would have been better off in the triple linen blouses of the Netherland tars, who change their woven skins with every fluctuation of the mercury. Woolen underwear, added to woolen jackets, must have provoked profanity in the latitude of the Philippines, and the old salts felt dampened from being refused shore-leave of absence; but the sensible bill of fare and the system of night-watches offset all that. Both sailors and marines get a liberal supply of canned vegetables, besides baked beans and peas, and plum pudding, or some equivalent "raisin-dough," every once in a while, — no grog, nowadays, and fresh water as often as it can be procured. Thrown on their own resources for weeks or months, ships escape the vicious commutation system of the army commissariat. Sailors in the service of Uncle Sam can rely on getting what soldiers might get if it were not for imprudent option rules and dishonest middle-men. The apparent grievance of intermittent night watches, too, is a blessing in disguise. If sailors had a casting vote on the subject, a considerable plurality would choose longer watches, followed by a chance for undisturbed slumber, and in an airy highland camp, or that problem of the future, a thoroughly ventilated ship, that plan would have undeniable advantages, but given closed hatch ways and stifling cock-pits, the alternative is, on the whole, hygienically preferable.

PINEAPPLE FIELD.

The air of the forecastle dormitories is often worse than that of a Neapolitan slum tenement, but before the floating disease germs get a chance to strike root, the sleeper is summoned on deck, and, at the rate of ten per minute, 2,400 repetitions of the respiratory process expurgate the lungs with as many doses of anti-microbe specifics in the form of cold pure air.

Within ten minutes after the stroke of the next relief bell, the catarrh motes of the cock-pit will recommence their at-

tacks, but the disease-resisting power of the organism, too, has been reconfirmed for hours to come, and the air-cure opportunities of the following day at last turn the scales in favor of continued health.

CUBAN HUT.

(Concluded.)

THE STOMACH AN EVOLUTIONAL AGENT.

MARY HENRY ROSSITER.

IN "Credidimus Jovem Regnare" Lowell says: —

> "Our dear and admirable Huxley
> Can not explain to me why ducks lay,
> Or, rather, how into their eggs
> Blunder potential wings and legs,
> With will to move them and decide
> Whether in air or lymph to glide.
> Who gets a hair's breadth on by showing
> That Something Else set all a going?"

This sentiment appeals to the busy man. His mind immediately applies the same principle to other great subjects of speculation. Whether his ancestors rose from the ape or descended from God he may not be sure. One thing he does know — that the present generation is a long way from either. It is more agreeable to believe that we have gradually made our way up, by sheer force of merit, from an inferior state, than to confess that the early image of the Creator has been so disfigured and dishonored by centuries of neglect and abuse that it is no longer unmistakable. Whichever be true, "it is a condition, not a theory, that confronts us." Considering the breakneck speed with which the majority of the human race are traveling the downward road of disease, it is a necessity, and not a speculation, to seek that Something Else, whether it be new or old, that will set us all a-going the other way. And we must "get on" more

than one "hair's breadth," and that very quickly, if we would make our search anything more than a vain inquiry.

When a man has Bright's disease, neurasthenia, rheumatism, or the gout, he does not care much about evolution. His one anxiety is to get rid of his physical ills. Generally, also, he demands immediate relief from suffering, and if this be obtained, concerns himself not at all with its primary causes. But if it could be shown that man is what his stomach makes him, that from the beginning the digestive organism has had more to do with the evolution of both body and mind than the most perfect Darwinian law, perhaps even the people who have twinges in their joints, as well as the vast army of those who would believe almost anything of their stomachs, would be glad to join in the study of a new evolutionary theory.

Is it, however, difficult to prove this? The very earliest picture of human life presents a garden, a woman perfect in body and pure in heart, and a tempter appealing to her senses by something to eat. It is not too much to say, then, that the first stomach trouble originated with the first pair, and was the direct result of yielding to appetite. We are fond of thinking how beautiful and how comfortable the world might always have been if Adam and Eve had not sinned. Let us fancy for a moment what perfect digestions we might still have if no one had ever eaten anything that did not agree with him.

From the standpoint of hygienic philosophy, it is far more reasonable to conclude that man has descended rather than risen from his first estate. Dietitians have proved that from the beginning of civilization there has been a steady departure from the use of natural foods. Primitive man lived upon simple grains, raw fruits, and nuts as they grew on bush and tree. He did not know how to make mince pie and plum pudding, or the later *paté de foie gras* and chafing-dish dainties. Primitive man was strong, full of vital power, commanding in stature, and lived to a good old age, untroubled by tuberculosis, appendicitis, nervous prostration, toothache, headache, locomotor ataxia, and a thousand other ills which shorten his life to-day. Every indication goes to show that while the race has been gradually advancing in knowledge and experience, it has just as surely been degenerating physically.

All through the ages the progress of the human mind has been checked by the weakness and disease of the body. Are there any who doubt that if the design of nature had been followed, if that noble and giant physical dwelling that was intended to be the first inheritance of every man, had been preserved and transmitted in all its perfection and its wonderful adaptability to the infinite and varied needs of the mind the evolution of the civilized man from the early savage would not have reqnired such tremendous sacrifice of health and vigor, and what we call advancement and "the higher life" to-day would have been immeasurably eclipsed by the brilliant glory of the perfect man — the developed mind in the natural body?

And the stomach, the digestive organism, which includes hunger and the appetiie for food, has been the most active agent in the painful and perverted evolutionary process which has brought us where we are. This is easily demonstrable. It is universally known as a fact, although not much considered, that bone and blood, brain and brawn, are directly manufactured from food eaten. It is now beginning to be discovered that for centuries people have not eaten the right foods to make the best bodies. They have been ignorant of the physiological laws of nutrition, of the proper

combinations and proportions of essential elements, of the vital importance attaching to such knowledge. They have cultivated artificial and abnormal tastes, sought momentary gratification in eating, and gradually demoralized their natural instincts. The influence of heredity, good or bad, is cumulative, and tends to increase in geometric proportions. It is hardly credible that beginning with the mind of a monkey, man could have attained his present intellectual eminence, while all the time, in his physical life, consciously or unconsciously at variance with the vital principles upon harmony with which all individual progress, whether mental, moral, or physical, depends. On the other hand, if there had not been added to his animal faculties and characteristics something of a higher order,— a divine spark, an intelligence, a moral power superior to that of any other creature,— must he not long ago have sunk below the ape, the horse, the dog, which, if they can not liquefy air or pacify Europe, do at least obey the laws of their physical nature, and are never individually responsible if they fail to reach the acme of ape, horse, or dog character? The fact that, notwithstanding the eternal warring of his members, man still preserves so much of goodness of heart and strength of mind is the best evidence there is of the constant indwelling of the divine life in humanity.

A specialist in nervous diseases once remarked that mind is a secretion of the brain; that it is the function of the brain to secrete mind just as it is the function of the liver to secrete bile. But all secretions depend upon the activity and soundness of the secreting organ. The healthy action of any organ depends upon the quality of the blood supplied to it. The quality of the blood is chiefly determined by the food eaten and the nature and extent of its assimilation. In one sense, then, man is absolutely what his stomach makes him. In another he is what he makes himself; for while the stomach acts upon the man, the man also acts upon the stomach. The man compels his stomach to receive certain foods, the stomach works out the man's body and character from these materials. Therefore, if a man eats wrong foods, the result is manifested in his whole being. If he overeats, his stomach makes him sleepy, dull, and cross. His mind is confused and sluggish. If he habitually overeats, this condition becomes chronic, his entire body is poisoned, his brain secretes an inferior quality of mind, and he transmits to his children a constitution and an intellect weaker than his own. On the other hand, if he does not eat enough, or if the food that he eats is not sufficiently nourishing and does not supply all the needed elements in the right proportions, the man becomes anemic,— impoverished in blood and brain. Again, excessively stimulating food brings about a condition of the blood still more potent in changing and modifying character than eating too much or eating too little. The man who swallows spices, condiments, pickles, or other irritating, hot substances, is almost certain to think irritating, hot thoughts, and to speak hot words. The constant use of animal foods and of stimulating drinks, like tea and coffee, gives rise to a dangerous accumulation of poisons in the system, and sometimes leads to melancholia or even insanity. One of the poisons commonly resulting from the use of flesh foods and stimulating drinks is known as uric acid, and is coming to be generally recognized as one of the most powerful factors in the causation of diseases. A distinguished English physician, Dr. Alexander Haig, has written a remarkable book, showing the relation of this formation of uric acid in the system to various mala-

dies, including hysteria, mental depression, Bright's disease, gout, and rheumatism. He makes the following strong statement: "Clear the blood of uric acid, . . . and the mental condition alters as if by magic, ideas flash through the brain, everything is remembered, nothing is forgotten, exercise of mind and body is a pleasure, the struggle for existence a glory, nothing is too good to happen, the impossible is within reach, and misfortunes slide off like water off a duck's back."

The influence of the stomach upon character has always been recognized by religious sects, especially in monasteries and nunneries. It has been recognized by thinkers and philanthropists, as scores of illustrations could testify. It has been recognized by schemers and plotters, who have used its agency upon their victims. But its constant and inexorable power, from the earliest ages, in causing the permanent modification of the entire human race, has been little considered.

It would be interesting to go back to the origin of man's divergence from a natural mode of living and to trace the influence of appetite, food, and digestion upon the differentiation and development of separate peoples; to make finer discriminations than the common association of the term "beef-eating Englishman" with the idea of aggression and conquest, or of the Chinaman's diet of rice with his lack of energy and enterprise.

It is more important, however, to consider the present and the future, to study how we may not only improve our own inheritance of blood and brain, but also how we may provide for generations to come a healthier beginning in life, better conditions in which to grow, and a more scientific knowledge of the relations of habits of life to character, and to physical well being. This is no vain inquiry for the mere pleasure of speculation. It concerns the permanence and perpetuity of the whole human family. Only when the evolutional power of the stomach is fully recognized and respected are we ready to work effectively for individual or public health.

An Important Article of Dress.

Van is four years old, and very proud of the fact that he can dress himself in the morning — all but the buttons "that run up and down behind."

Van isn't enough of an acrobat yet to make his small fingers do duty between his shoulder-blades, so he backs up to papa and gets a bit of help.

One morning Van was in a great hurry to begin some important work he had on hand, the marshalling of an army, or something of the sort, so he hurried to get into his clothes, and, of course, they bothered him because he was in a hurry and didn't take as much pains as usual. Things would get upside down, "hind side 'fore," while the way the arms and legs of these same things got mixed was dreadful to contemplate. So I am afraid it was not a very pleasant face that came to papa for the finishing touches.

"There, everything is on now!" shouted Van.

"Why, no, Van," said papa soberly, "you have n't put everything on yet!"

Van carefully inspected all his clothes, from the tips of his small toes up to the broad collar about his neck. He could find nothing wanting.

"You have n't put your smile on yet," said papa, with the tiny wrinkles beginning to creep about his own eyes. "Put it on, Van, and I 'll button it up for you."

And, if you will believe me, Van began to put it on then and there! — *Sel.*

CHILD LIFE IN A CROWDED CITY CENTER.

KATHARINE LENTE STEVENSON.

"THEY look up with their pale and sunken faces,
And their looks are sad to see,
For the man's hoary anguish draws and presses
Down the cheeks of infancy."

So wrote Mrs. Browning a half century ago, of child life in the mining districts of Great Britain; so might she write, were she with us to-day, of some of the aspects of child life in a crowded city center.

It is but fair, however, to emphasize the fact that there are other aspects. The prematurely old child, the one whose eyes fill you with haunting memories of the sphynx, and who looks into your face with a kind of elfish wisdom, of all things most unchildlike, is by no means an unknown quantity in settlement life. It is, perhaps, the saddest thing we meet in that life, and the most hopeless. A man may get very far away from God and righteousness; yet, if there are sweet memories of childhood in his heart, there is always a leverage that may be used to bring him back to that childhood of which the other is but the type — that childhood which is the one essential prerequisite to entrance into the kingdom of heaven. But God pity the man or woman who never knew a childhood! How hardly — with what sore difficulties — shall they enter into that kingdom!

But there are real children in crowded city centers; even the slum is not without its sprinkling of them. Strange flowers for such arid soil, they look up into your face with all the witchery of a child's smile, and twine themselves about your heart with the blessed confidence which belongs, as a special inheritance, to those whose angels "always behold the face of our Father." Happy-go-lucky little men and maidens, they show a most philosophic contempt for the small inconveniences of dirt, poverty, unpleasant surroundings, and the like. Indeed, they afford the most striking proof I have ever met of man's ability to overcome environment. To hear a child's laugh ringing out from a filthy back alley as merrily as it could from a blessed sun-kissed hill-slope is to have one's faith in God strengthened and one's hope for humanity renewed. How truly must the human life be made in the image of him who sees the end from the beginning, if, under such untoward circumstances, it can still know joy!

Surely, there is nothing that of itself would tend to joyous-

ness connected with the child life of a crowded city center. Whatever else may be provided for in that life, the child, in any true, normal conception of the needs of childhood, is entirely ignored. There is no place for a child in a slum or in a workingman's district. He is manifestly regarded by our wise political economists as a luxury which only the very rich should afford. Those who work for daily bread at the bidding of their masters — what have they to do with children?

It is true that the children of the slums are many and that those of the boulevard are proportionately few, but this fact by no means alters the wise rule which prevails in the economic world. If the poor choose to have children when no provision has been made for them, why, they must suffer the consequences, and suffer the consequences they do.

Imagine a family of three, four, five, or even eight and ten children, packed away in two, three, four, or five small rooms. Could anything be more conducive to immorality, or less conducive to a wholesome self-respect? The vast majority of these tenements have no bath-rooms, some even have no water in the house. Is it any wonder that the children are untidy — at times even filthy? Since living in Chicago Commons I have ceased to wonder at the filth of the very poor. The wonder is, rather, that under such unfavorable circumstances any cleanliness is possible.

But when the children are released from their homes, where may they go? There is but one place, and that is not theirs by right; indeed, it is theirs hardly by sufferance. The street receives them simply because it is a law of nature that, having come into being, they must *be* somewhere; but if one would realize on what a precarious hold they tread the street, he has only to watch the swift dispersion of a crowd when the blue uniform of a policeman turns the corner. I have seen the merriest kind of a game going on in front of Chicago Commons, with perhaps twenty or thirty children taking part, when — presto! there was a swift scudding of feet, and in the twinkling of an eye not a child would be in sight. Where they went I could never make out, but the distance could not have been great, for hardly was the "Cop" again out of sight when they were back at their game, as if there had been no interruption. A sense of humor caused a smile at the situation, but a deeper, philosophic sense could not forbear a sigh.

What kind of training is this for the men and women of the future? Shall we wonder at lying and deceit and hypocrisy as phenomena of total depravity, when, by such an elaborate system of civilization, we foster them in a child's mind? The child criminal is as purely a natural product of existing conditions as is typhoid fever. When even one tenth of the money that is spent for reformation shall be spent in the normal processes of formation — in parks and play-grounds, in healthful, clean amusements, the street arab will disappear by the process of a natural evolution, and with him, very largely, if not wholly, will go the youthful criminal.

The social settlement appeals, first of all, to the child life of the community. The children are its natural, inalienable allies. It comes to them with all the surprise of a place to which they are really welcome. They take possession of it as by a kind of divine right, — indeed, I am not sure that it is not theirs by the divinest of rights, that of need. The kinder-

garten is the basis of operations in every settlement of which I have any knowledge. Around it the life of the residents and, in time, of the community, comes, in a sense, to revolve. Mothers' meetings grow out of it as an inevitable result. Boys' and girls' clubs come by natural evolution, and the *crèche* makes the final link that binds the settlement to the home life of the neighborhood — through its childhood.

All these specific lines of work are carried on at Chicago Commons. In the kindergarten nearly one hundred children, chiefly Italians, are gathered every morning. The various clubs count four or five times that number, and the *crèche* accommodates fifteen or twenty children, with great demand for immediate enlargement.

The sweet amenities of the kindergarten are already making themselves manifest in many of the children. They love it with a devotion that is touching in the extreme. With the vast majority it is the only bit of brightness their lives contain. They look with worshipful admiration upon the pretty dresses and bright, animated faces of their sweet girl teachers. They touch the pictures and games with a reverent awe. The house is a revelation to them of a kind of life of which they never dreamed. The Chicago Commons kindergarten makes practical housework a part of its training. The children are taught to wash and iron; to make beds, set the tables, clean vegetables, etc. One little girl, when first taken by her teacher into our bright dining-room, burst into tears upon the threshold. "Oh, I can't go in there," she said, "I never was in no such place. My mama would whip me if I did." Little by little the thought of cleanliness and brightness outside of the kindergarten enters their minds. One mother said, "My boy, he give me so much troubles. He's all the time got a rag and cleaning up."

When the kindergarten bathtub was first put into the building, there was fierce opposition to it on the part of both mothers and children, but it has come to be regarded as a blessing by many, and clean hands and faces are by no means so rare as aforetime.

Perhaps in no other way does a social settlement minister quite so fully to the child life of a community as in its picnics and fresh-air work. Many of the children had never seen a flower or even a blade of grass growing, until taken to the parks by their teachers. The first time they were taken, two or three of the little creatures threw themselves upon the grass and kissed it in a passion of delight. They pluck the green blades to carry home with them, and show as genuine an appreciation of nature as if they had always known her fostering care. The flower-mission work is a bit of settlement activity which is as trying in some respects as it is charming in others. The joy of the children in receiving the flowers constitutes the charm, but to find one's self followed for blocks by a mob of eager suppliants, each madly vociferating, "Please give me a flower," is somewhat of a trial. When once the flowers are received, they are most tenderly cherished,

and sometimes the wee ones will bring to their teachers, as an especial boon, a withered bunch of posies, which had been given them days before.

The work of the Boys' Club is one of the most encouraging things connected with the settlement. From a company of wild, unorganized hoodlums they have become a self-governing organization, with self-imposed rules, more strict than any we would ever have ventured to suggest. This summer a boys' camp in the neighborhood of Elgin has been the haven of their hopes and the reward of their good behavior. There they have learned gardening, cooking, and the care of their tent-home, and have also had the blessed privilege to which every boy is entitled, of a free country life, with swimming, fishing, and other natural sports. Their fear of the dark and quiet of a country night was, at first, most pathetic, but they are gradually becoming accustomed to it, and dread their return to the din of the city.

In several respects the child of a "slum" neighborhood is better off than his brother or sister upon the boulevard. He is far more self-reliant, and as a rule, infinitely more unselfish. The devotion with which the elder children of an Italian household give themselves up to their younger brothers and sisters is a revelation of sweet. unselfish helpfulness.

I have in thought a little brown-eyed maiden of about ten years of age, who seems to have no life apart from her two-year-old sister. She takes her with her constantly, carries her in her arms whenever her royal highness — who rules with a rod of iron — objects to walking; shows off all her baby tricks with a fond pride that is delightful; pets her when cross and nurses her when tired; in fact, wherever "Baby Lazia" sets up her court, — and it is set up wherever the small personage happens to be, — there is always Annie, her worshiping subject. I have never seen Annie manifest impatience; never known her to speak a cross word or give an unkind glance, and I have often wondered how many ten-year-old maidens of the "better classes" (!) would care thus tenderly and unselfishly for a baby sister.

The family tie in such a neighborhood as ours is close and, on the whole, tender. I have been surprised at the small amount of quarreling one hears; surprised at the brightness and sunny good humor which pervades many of the faces; surprised above all by the delicate, sympathetic kindness these children of the poor show to one another. Little Annie, for

example, reminds one constantly of Mrs. Wiggin's sweet story of "Timothy's Quest." She is a veritable girl-Timothy, and I rarely see her tripping through the streets and flashing one of her irresistible smiles, that I am not forcibly reminded of certain sour, selfish little maidens I have seen in homes of ease and luxury.

If there could be a plea for a slum, it would be found in the characters of some of the children who live there. Annie's teacher asserts that the child is absolutely without a fault; that she can not think of one characteristic in which she could be improved. When one has made all due allowance for a teacher's fond partiality, the fact remains that she is as rare a little human soul as ever blossomed on this earth, and that, despite the fact that her home is hardly better than a pig-sty, that she knows nothing of a life outside the streets and alleys of the seventeenth ward.

And yet, granted that this is true, is it therefore an argument for the slum? God forbid. "Shall we continue in sin that grace may abound?" The Annies are, alas! the exception to the rule, and for them there are the long years of inevitable coarsening, the hardness, the ignorance, and often the sin and crime which such a life entails.

The child life of a crowded city center has taught to me three lessons which stand out above all others: First, how much of the divine inheres in the human, even under most adverse circumstances; second, how man's bungling ignorance mars God's work; and third, how small an effort it would take, after all, to bring this world back to God and to gladness if only the effort were really made. When Christianity shall become Christianized, and each shall esteem other better than himself, then the slums themselves, and the child life in them, will be redeemed to health, to cleanliness, to happiness, and to righteousness.

WOMEN know
The way to rear up children (to be just);
They know a simple, merry, tender knack
Of tying sashes, fitting baby shoes,
And stringing pretty words that make no sense,
And kissing full sense into empty words;
Which things are corals to cut life upon,
Although such trifles: children learn by such,
Love's holy earnest in a pretty play,
And get not over early solemnized,
But seeing, as in a rose-bush, Love's Divine,
Which burns and hurts not,— not a single bloom,—
Become aware and unafraid of love.
Such good do mothers.

— *Elizabeth Barrett Browning.*

THE HYGIENE OF THE VOICE.

F. MAGEE ROSSITER, M. D.

If half the care were exercised to keep the voice in tune that is given to an inanimate instrument, the world would be full of melodious tones and beautiful songs, and we should be spared the almost universally harsh, high pitched, rasping sounds that now greet our ears on every side. The human voice is the most wonderful instrument in the world. The tremulous, subdued tones of a pipe organ, or the sweet, delicate obligato of the violin, appeal to the inmost emotions; but the cultivated human voice, with a tender sympathy behind it, whether it be in song or in the entreaty of a friend, touches the deepest heart of man, and affects his entire life.

The voice, above all instruments, should receive care and attention. We can lay down as a broad and general rule, that whatever promotes the maintenance of robust health serves as an invaluable agent in the development of the voice.

The first thing necessary to the hygiene of the voice is correct breathing. All bands, constrictions, and tight clothing must be removed from the waist and chest. There should be an unobstructed passage for air from the diaphragm to the lips.

How shall one breathe? What is the correct way? These are questions that many are asking, and that many have attempted to answer, often doing much harm. Cities and towns are full of "professional" voice trainers, who do not know the first principles of natural breathing.

There is only one right way to breathe. We hear much about chest breathing, diaphragmatic breathing, and abdominal breathing; but none of these methods is correct; all are incomplete, and any one of them, if practised alone, will result in harm. If those who are in doubt as to the natural method will watch a little child breathe, the question can be settled beyond controversy. The entire front of the body moves forward, and there is also a slight lateral movement. It is a false conception of respiration which says that the chest shall not move at all, but that all the movement should be confined to the waist.

The base of the lung should fill with air first, as a result of the contraction of the diaphragm, which is a cone-shaped muscle forming a separation between the thoracic and the abdominal cavities. This muscle flattens out during inspiration because of the contraction of its muscular fibers; at the same time, the ribs to which it is attached rotate outward and a little upward. The latter action tends still further to flatten this muscle. The downward movement of the diaphragm presses upon the stomach and liver, and produces a slight forward movement of the abdomen. As the lungs fill with air, there is a gradual expansion of the chest forward and laterally, which completes the movement of inspiration. So, during the entire period of breathing in, there is a rhythmical movement of the front of the body, beginning with the abdomen, and quickly passing up to the throat. In inspiration the abdominal muscles are perfectly passive, but they are active in expiration. This action is an important factor in voice production. The same principle holds good in the breathing of the lower animals. When a cat mews, a dog barks, a cow lows, or a horse neighs, the abdominal muscles contract and become tense, the diaphragm relaxes slowly, and some of the little muscles between the ribs become tense.

Speaking or singing from the throat not only produces an irritating tone, but also a chronic state of irritation of the larynx and pharynx, causing some of the most obstinate forms of catarrh. These parts are often kept in a continual state of disease by speaking rapidly and in a high-pitched, unnatural tone of voice. One who speaks thus is not only doing himself an injury, but is also injuring those who are compelled to listen.

Since voice is the result of vibrations of air and can not be produced without it, we should first see to it that there is always an abundance of pure air. Rooms should be thoroughly ventilated night and day. The voice is quickly affected by a vitiated atmosphere, such as is found in poorly ventilated churches, houses, public halls, and in large gatherings. The air which is laden with the poisonous exhalations of the lungs, organic matter, and carbon dioxide gas, together with the germs that are floating about, affects the vocal organs and also poisons the body. Singing in poorly ventilated rooms will rob the voice of its freshness and purity of tone. A heavily laden atmosphere is a bad conductor of tones, and an impure atom of air will destroy the purity of a tone.

Climate has much to do with the voice. No doubt the peculiarities of the language combine with the favorable climate to make the Italian voice sweet and smooth. An extremely cold or a very hot climate is not conducive to a clear, musical voice.

It is a bad practise to sing out of doors in the cool, damp air of evening. One should avoid breathing damp air after any prolonged use of the voice. The throat should be well protected, and the air taken in through the nose.

All forms of judicious exercise are good for the voice. Mountain climbing is especially recommended by some. A cool sponge bath every morning is excellent, as it relieves the congestion of the membrane of the throat, and stimulates every activity of the body. The sponge bath gives tone to the entire system. Hot baths and long-continued local steam applications before singing should be avoided, as these produce congestion of the mucous membrane of the pharynx and larynx.

No mouth breather can ever expect to have a musical voice. If one breathes through the mouth, the mucous membrane becomes dry and irritated because of the absence of normal secretions and the presence of dust and germs. It is just as impossible to produce good tones with a dry mucous membrane as it is to whistle with dry lips. Mouth breathing results in a thickening of the linings of the throat, and produces partial deafness. All the animals breathe through the nose, except the dog when panting. If the nose of a horse or a cat be held shut, the animal will almost suffocate before breathing through the mouth; animals do not seem to know how to breathe through the mouth. When the Creator made man, he breathed into his nostrils the breath of life, and he became a living soul. If man would always persist in breathing in this primitive way,—through his nose instead of his mouth,—he would continue longer to be a "living soul."

Attention to diet should have a very important place in the hygiene of the voice. A diet that affords an abundance of ripe fruits is beyond all question the best food for singers. With this can be combined grains and some varieties of nuts; however, the very oily nuts, those that are rich in fat, are not good for the voice or the throat, as the oil causes irritation. The diet should be simple and plain, excluding many dishes at one meal and also bad combinations. The juices of fruits, together with the acids which

they contain, have a cleansing effect upon the mucous membrane of the mouth and pharynx, washing off any thick, tenacious accumulations of mucus, leaving a smooth, thinly lubricated surface, which assists greatly in enriching the tones.

Fruits not only cleanse the mouth and pharynx, but cleanse the stomach also; the acids of fruits destroy germs in the digestive tract and increase its activity, thus keeping the bowels in a good condition. This is very important. Constipation is sure to cause more or less trouble with the pharynx. The vocal cords are likely to become congested, and the person is more subject to frequent colds because of the local reduction of vitality of the tissues. A very intimate relation exists between the different portions of the alimentary canal. Congestion of the lower end of the bowel is sure to aggravate and increase any catarrhal condition of the mucous membrane of the throat and larynx.

Observation, analogy, and science all conclusively show that meat is not a good diet for singers. The best diet is fruits, grains, and nuts. Nations that eat largely of meat and fish are not musical. The great masters of musical art in Germany appeared during the last century, when meat was considered a very great luxury because of its scarcity, and the poorer classes, from which most of the musicians came, rarely ever saw it. Italy, where the people subsist upon nuts, cereals, macaroni, and fruits, is a musical nation, and her masters and composers stand in the forefront.

If one desires to keep the voice soft, flexible, and sweet, he should avoid all condiments, candies, fried foods, fatty, greasy foods, eating between meals, and indulging in late suppers. The free use of butter should be avoided. One should obtain abundance of refreshing sleep. No difficult singing should be attempted after eating a full meal; however, many singers take a light luncheon one or two hours before going on the stage. An exclusive meal of fruits would be most excellent for this luncheon.

The "alcohol voice" and the "smoker's voice" are well known to physicians. Alcohol irritates the lining membrane of the mouth and throat, and produces congestion; in time these surfaces become hardened. The vocal cords are thickened, and become less flexible. Smoking causes muscular relaxation and a diminution of vigor of the tissues; both of these conditions produce hoarseness, doubtless due to continual irritation of the vocal cords. The voice becomes gruff and harsh. It loses its sweet resonance. The use of vinegar and pickles is also injurious, producing almost the same effect as the use of alcohol.

If one contracts a cold and is troubled with hoarseness, the voice should not be used either in singing or in speaking, for the inflammation that already exists will only be aggravated, and the irritation thereby increased. The hoarseness should be relieved before the voice is used; otherwise serious injury may result.

The voice should be exercised every day, as otherwise one soon loses all that he has gained by care and practise. A proper use of the voice, with strict attention to hygiene, is an important factor in the promotion of health.

A CROWD of Troubles passed him by
As he with Courage waited;
He said, "Where do you Troubles fly
When you are thus belated?"

"We go," they said, "to those who mope,
Who look on life dejected,
Who weakly say good-by to hope —
We go where we're expected."

— *Life.*

THE DIGESTION OF STARCH.[1]

J. H. KELLOGG, M. D.

BREAD consists, essentially, of two things,— starch and gluten. There is very little fat in ordinary wheat bread; the amount is so small that it may be practically ignored. Gluten is present in common wheat flour in the proportion of from twelve to fourteen per cent. Starch is present in the proportion of about fifty per cent. Bread consists of about fifty-five per cent. solid matter and forty per cent. water. About thirty-five per cent. of the weight of wheat bread is starch. It is very important to understand the digestion of starch, since it is so large a component of that particular article of food which has been designated, the world over, as the "staff of life." In every country and among every people we find that bread is the one indispensable article of food. When the people are hungry, the cry is, "Bread — give us bread!"

The first digestive fluid with which bread comes in contact is saliva. The saliva converts the starch into sugar, and the process of changing the starch into sugar is a complicated one. Saliva acts upon cooked starch, and as it does so, dissolves it. The insoluble starch, being rendered soluble by the action of the saliva, is converted into a dextrin known as "amylodextrin," or starch-like dextrin. This dextrin is further acted upon by the saliva, broken up more and more, and changed until it comes to the stage of "erythrodextrin," The erythrodextrin is acted upon until it becomes "achroödextrin." The achroödextrin, after passing through a number of further changes, is finally converted into sugar or "maltose;" so that there are four principal steps in the conversion of starch into sugar.

I will briefly illustrate these stages,— first, the change of starch into amylodextrin. I have in this tube a solution of amylodextrin; I put into it a little of this (Lugol's) solution, and it at once becomes blue, a dark bluish purple. This is the chemical test for amylodextrin. Erythrodextrin is so called because the addition of the iodine test, or Lugol's solution, produces a purple color. Achroödextrin produces no color with the iodine test. Maltose is also colorless with iodine.

Now I wish to prove that all these changes take place in the digestion of starch. First I will chew a little boiled rice for a few minutes. Now I swallow the food into this test-tube. I boil the solution for a moment, and then add the sugar reagent to it. The solution at first turns blue. Now it is a distinct orange-red. Here is an ordinary solution of cooked starch. I add a little of the test-solution. It gives a blue color. But, when I add the test to the chewed rice, you notice that the blue color does not appear; and under the test for sugar, the orange color appears instead. This is proof of the presence of sugar and of the complete digestion of starch, for the saliva converts starch into sugar.

It requires some time for this change to take place, and in raw starch the change does not occur at all, for the saliva has no effect upon raw starch. Before the saliva can act upon it, the starch must be cooked. Observe that when I put a little of this iodine solution upon a piece of bread, it produces a blue color. Now here is a raw potato. I cut off a piece of this potato, and apply the iodine to the cut surface. You see that the iodine does not act upon it, the blue color does not

[1] Abridged from an illustrated lecture before the patients at the Battle Creek Sanitarium.

appear. I hold the potato over the flame for a moment, and then apply the iodine test,— now you notice that the blue color appears at once. This is due to the fact that the potato has been cooked. The iodine acts upon cooked starch, not upon raw starch. The very same thing is true of the saliva. It will act upon cooked starch, but not upon raw; it converts cooked starch into sugar by passing it through the various stages which I have described, the final end of starch-digestion being sugar.

But the different changes of which I have spoken can be produced by other means than by the action of saliva. Boiling with sulphuric acid will convert starch into sugar — but not the same kind of sugar. This kind of sugar, or glucose, is the sort that comes from Illinois cornfields. Now we have a sugar factory in our own bodies, so that we do not need to patronize the glucose factories. Our home-made sugar is far better than any that can be manufactured in the chemist's laboratory.

In the ripening of fruit, starch is converted into sugar. Take an apple and apply the iodine test. Here is an apple that is not quite ripe, so there is a slightly blue tint. Here is one that is still greener. It gives a strong bluish color. This shows that there is starch in green apples. A perfectly ripe apple does not show a blue color, for the reason that there is no starch in it. In the process of ripening, the starch is digested — converted into sugar, acids, and dextrin. It is for this reason that some apples are so sweet when ripe. This same principle applies equally to other fruits. The same change takes place in the ripening of fruit as in the process of salivary digestion; the raw starch is first converted into soluble starch or amylodextrin, then into erythrodextrin, then into achroödextrin, and last into sugar,— some portions becoming malic acid.

Another method by which starch can be converted into dextrin is by the use of heat. By the application of heat, raw starch is cooked, and if it is cooked long enough, it becomes soluble starch. That is the reason why partially cooked flour or cornstarch can be used for paste. The paste owes its adhesiveness to the fact that the raw starch is converted into soluble starch. You would not think of making paste out of browned flour, because the starch has been cooked too much. In order to make good paste, it must be cooked just enough to carry it to the stage of soluble starch, or amylodextrin. This pasty starch is excellent for papering walls, but not for food, because it is only in the preliminary stage of digestion, and forms indigestible masses in the stomach.

Now if we expose this starch, by baking, to a higher temperature than the boiling point, by and by it passes through a further stage, that of erythrodextrin. Then if we expose it to a still higher temperature long enough, it will be carried to a further stage, that of achroödextrin, and so on, until it finally comes within a single step of maltose, or sugar. But starch can not be converted into sugar by any amount of boiling, because if exposed to a high temperature, it is converted into caramel; it must be baked in an oven.

I have stated that if cereals of any sort are cooked for a short time, the result will be a production of amylodextrin. I wish to prove this statement: I have here a dish of oatmeal mush, and I hope to convince you that oatmeal mush, porridge, and similar preparations to which we have been so much addicted for many years, are unwholesome. You remember that I had a solution of starch,— what color was produced when the iodine test was applied? It was blue, was it not? That starch was in the first stage of digestion — amylodextrin. Now I put into this oatmeal a few drops of the iodine solu-

tion. This oatmeal has been cooked twenty minutes, which is the "regulation time." I put in one drop and it becomes blue; another drop,— it remains blue; another,— it is still blue — it is blue all the time. This is twenty-minute oatmeal mush; we will keep that. Now we will try an experiment with some oatmeal mush that has been cooked for five hours. We will apply the test for starch. Notice the difference. Two or three drops caused the twenty-minute cooked oatmeal to become intensely blue; adding the solution to the five-hour cooked oatmeal gives a purple color. The difference is that the latter has reached the second stage of digestion, while the first was cooked only twenty minutes, thus reaching only the first stage. There is a great contrast between the five-hour oatmeal and the twenty-minute oatmeal. The difference is just this: the short-cooked oatmeal has entered only upon the first stage of digestion, and the saliva must do all the rest of the work of digestion; whereas, in the long-cooked oatmeal a considerable part of the work has been done by the cook-stove. It is much better and cheaper for the cook-stove to do a part of the work than it is for the stomach to do it all, because digestion exhausts much of the energy of the body, hence the energy that has been expended by the cook-stove may then be saved and put to some other useful purpose.

I wish now to call your attention to the effect of a few drops of starch test on this baked potato. It becomes intensely blue, as you see. Now contrast the five-hours-cooked oatmeal and this baked potato. Notice the difference; the potato has reached only the first stage of digestion, while the oatmeal has reached the second stage. Here you can see the reason why potato is less easily digestible than well-cooked oatmeal. Now we wi'l try some boiled potato. You see the very same thing that you saw in the baked potato — an intense blue color. The same thing is true of all vegetables. Vegetables, when cooked, are moist and soft, and enter the stomach in just that condition, without proper mastication. This objection applies also to mushes and other soft grain preparations, and especially to those which are imperfectly cooked. Mush is soft and pasty, and slips into the stomach without being properly mixed with the saliva necessary to act upon it so as to complete the digestive processes which might have been more perfectly performed by heat in cooking.

Again, I have here a granose cake. I put it into a glass of water, and in less than thirty seconds the granose completely fills the glass. This shows what takes place in the stomach when granose is eaten,— it is instantly softened and completely macerated by the digestive fluid. Now, I will turn off some water from the glass into a test-tube for another experiment, to which I wish especially to call your attention.

In another test-tube I place the solution of oatmeal, which has been boiled for twenty minutes, and in a third tube I place a solution of the five-hours'cooked oatmeal. Now I will add to each of these tubes the same number of drops of iodine solution, drop by drop, and let us notice the result. I have now added sixty drops of the solution to each tube. Notice the difference. One tube, which contains a solution of the twenty-minutes' cooked oatmeal, presents an intensely blue color. The next, containing a solution of five-hours'cooked oatmeal, is purple; while the third, containing a solution of well-cooked, slightly browned granose, is colorless, or a light straw color.

The difference in color is due to the presence in the first tube of amylodextrin, which gives a blue color with iodine; in the second tube erythrodextrin, which

gives a purple color with iodine; and in the third, achroödextrin, which forms with iodine a colorless compound. Here we have represented the first three stages of digestion.

If I should apply the same test to zwieback or to the outer crust of bread, the result would be the same as with granose. The same is true of any starch which has been cooked until brown. This is the reason why the baby can digest browned flour when it can not digest anything else. The cook-stove has done the work which the feeble stomach of the infant is not prepared to do.

It is a great advantage thus to lighten the labor of the stomach by the thorough cooking of cereals. Cook-stove energy is much cheaper than stomach energy; it costs very much less to maintain a cook-stove than a stomach. The most natural foods of the human family, fruits and nuts, contain practically no starch. The starch is, by the process of ripening, converted into dextrin, sugar, or acids, so that the blue color can not be obtained by the application of iodine. By the use of vegetables and cereals, which involves a large amount of useless labor in starch digestion and sugar-making, we impose an unnecessary task upon the digestive organs. This task is one which can scarcely be considered altogether physiological, and hence it may properly be lightened as much as possible.

A correct idea of the amount of labor which is saved by this preliminary heat digestion of starch, can be gained only by a consideration of the fact that the change from raw starch to sugar involves twenty-five or thirty different steps or stages through which the starch passes,— various forms of dextrin, of which the three dextrines mentioned,— amylodextrin, erythrodextrin, and achroödextrin,— are typical representatives. These dextrins, instead of being the only products formed in the transformation of starch into sugar, are simply landmarks along the road by which the insoluble and very stable carbohydrate of starch is converted into the extremely soluble product, sugar, which, through the readiness with which it is absorbed, passes quickly into the circulation and becomes a supporter of vital work.

What are the conditions which make it especially desirable that starch should be as perfectly digested as possible before entering the stomach? I think I may say that about one third of all persons suffering from stomach disorders have what is called "hyperpepsia," a condition in which the stomach makes too much hydrochloric acid. Hydrochloric acid, when present in the stomach in more than very minute quantities, completely paralyzes the action of the saliva. This an experiment will show.

There are various things which interfere with the action of the saliva. In order to present the subject clearly, I will make a few more experiments. I have here five glasses, containing a solution of boiled starch. I put a little saliva into each of them, and into one of them I put a little vinegar, into another, a little hydrochloric acid, and a little oxalic acid into another. We will examine the contents of the glasses from time to time and notice the results.

We see that when vinegar is mixed with the saliva and the starch, the action of the saliva is absolutely *nil.* One teaspoonful of strong vinegar is enough to spoil the digestion of a whole dinner, so far as the starch is concerned. One part of vinegar to five hundred parts of starch, as has been shown by experiment, will absolutely prevent the action of saliva upon starch.

We also see that saliva in the presence of hydrochloric acid (unless the amount is exceedingly small) has no effect upon

starch. The same is true with oxalic acid, or the acid of the pie-plant or rhubarb, which is a poison. One part in ten thousand of this acid interferes totally with the action of saliva. What, then, could be more absurd than to eat a pie-plant pie, which contains oxalic acid, an acid which paralyzes the action of saliva, which is needed to digest the pie-crust!

What an absurd thing, also, is the use of pickles, — a vegetable product containing starch to be digested by the saliva, and which is saturated with vinegar so that the starch can not be digested at all. How absurd also to put vinegar upon vegetables, or any kind of food requiring salivary digestion.

We will suppose now that here is a person who has hyperpepsia, his stomach making too much hydrochloric acid. Hydrochloric acid is not always present in the stomach; there is none present when a man first begins his meal; normally there is very little present for the first forty minutes after the meal. At the end of from thirty to forty minutes the action of the saliva ceases, because it is then checked by the gastric juice which is produced, so that no change ordinarily takes place in the starch digestion after the first forty minutes after the meal is eaten. This is the reason persons suffering from hyperpepsia get along very well for the first thirty or forty minutes after a meal, while the saliva is acting. Saliva added to granose or zwieback results in the instantaneous formation of sugar. It is only a slight step from achroödextrin to maltose. Now, while nature allows the saliva forty minutes to digest starch in the stomach, if a person has hyperpepsia the stomach secretes hydrochloric acid so fast that there may be only from ten to fifteen minutes for the completion of the work of starch digestion, the action of the saliva being checked by the production of hydrochloric acid. You see then, how important it is that such persons should take starchy foods in the form in which the digestive changes can be completed rapidly, having previously undergone heat-digestion in the oven before being taken into the stomach.

It is the failure to understand and make use of such important chemical and physiological facts that has led so many physicians to prescribe for patients suffering from hyperpepsia an almost exclusive meat diet, prohibiting altogether the use of starchy foods. With this knowledge in hand, it is possible to supply to persons suffering from hyperpepsia farinaceous foods prepared in such a way that even their crippled stomachs can deal with them without difficulty, thus avoiding the great evils which arise from the employment of an exclusive meat diet for any considerable length of time.

The majority of dyspeptics, especially persons suffering from hyperpepsia, should live upon a strictly dry diet, and all the bread eaten should be taken in the form of zwieback or granose. Granose is an ideal food for persons suffering in this way, for the reason that it is so easily disintegrated in the stomach that the saliva can instantaneously come into contact with every minute particle of food substance, thus quickly effecting the necessary change.

I will now make an experiment which will show you the difference between the outside and the inside of a loaf of bread: Here is a solution made from the outside crust. I put in a drop of the test solution, and it disappears. I put in another, and another, and another, and all disappear, proving that this part of the bread has reached the third stage of digestion. Now applying the iodine test to a solution of a portion of the inside of the loaf, we see that it becomes purple at once, having reached the second stage. But the bread of the inside of the loaf is better

than the twenty-minute oatmeal, which produced a blue color with the iodine, representing the first stage of digestion.

The same thing is true of "minute-puddings" and breakfast baking-powder biscuit which have been cooked for fifteen or twenty minutes. The same remark also applies to griddle-cakes and other foods which are not cooked more than fifteen or twenty minutes. They have reached only the first stage of digestion. Oatmeal must be cooked a long time, and it reaches the second stage of digestion only after boiling for five hours, whereas zwieback, when baked one hour, has reached the third stage, because it is perfectly dry and exposed to a temperature of 300° to 400° F.

According to these principles we must discard gruels, mushes, vegetable soups, and rice unless it has been thoroughly cooked and browned in the oven. We have found by experience that browned rice is digestible by people who can not digest rice in the ordinary form, for the reason that it has reached the third stage of digestion.

If we will confine ourselves to a diet of dry foods, we shall soon see how much more wholesome they are than are moist foods. Dryness of food stimulates the flow of saliva, whereas the salivary glands refuse to pour out their secretion upon moist foods. Fishes have no salivary glands. There is a stream of water running through the gills of the fish all the time and nature declines to throw saliva away. If a person makes a fish of himself, so to speak, and pours a constant stream of water through his mouth while eating, in the shape of ice-water, tea, coffee, soup, milk, he must expect that his salivary glands will retire from business, and that he will sooner or later become a victim of amylaceous dyspepsia.

The ideal bread is not a loaf with a brown crust on the outside and a moist crumb on the inside. It is possible to roll a moist crumb from the inside of a loaf into a bullet so hard that, if thrown at a person, it would hurt him. If a person sends such bullets as that into his stomach, he must not be surprised if his stomach is hurt by them. Many a stomach has daily toiled for hours to dispose of these dangerous bullets. There are myriads of germs inside each of them, which are capable of forming in the stomach butyric acid, acetic acid, oxalic acid, and a long list of poisonous substances. Some of these poisons produce drowsiness after meals; others cause pyrosis, or heartburn; some produce excitability of the nerves, making one cross and sour; others cause decomposition or decay in the stomach, others produce giddiness, biliousness, and other unpleasant sensations. The ideal bread is the wafer, a bread made so thin that the heat can penetrate every part of it, so that, when eaten, it is ready to be converted into achroödextrin in the stomach. Such bread, in my estimation, is as near the ideal bread as anything that you can find in the shape of breads made in the ordinary way. Of all grain preparations, however, I must commend granose as the ideal cereal food. It is twice cooked, and is disintegrated more completely and quickly than any other food. It can be easily chewed, even by a toothless person. In granose heat-digestion has been carried to the farthest useful limit. Although so easily masticated, granose is the very quintessence of crisp dryness, and withal is as palatable as the most fastidious could desire.

THROUGH THE GOOD HEALTH SPY-GLASS.

THE ladies of the Russian court were greatly excited not long ago because the czarina would no longer allow them to smoke cigarettes in her presence.

In a certain European city, says the *Youth's Companion*, a decree has been issued forbidding the granting of a marriage license to any person in the habit of becoming intoxicated.

Miss Susan B. Anthony says that she never takes a hearty dinner before public speaking or a fashionable supper after. A bath, a cup of hot milk, and a cracker, assures this venerable pioneer of woman suffrage her necessary nine hours' sleep.

The use of alcohol has increased twenty per cent. in ten years in this country, says O. M. Belfry, M. D., in the *Quarterly Journal of Inebriety*. Villard says its use has doubled in Marseilles in twelve years. Garnier asserts that in fifteen years, lunacy in Paris has increased thirty per cent., as the result of drinking alcohol.

Professor Vincenzi, of the University of Sassari, has discovered that the holy water used in certain churches is a favorite rendezvous of germs. A single drop taken a few hours after the water was renewed, and spread upon gelatin, yielded in forty-eight hours about two thousand three hundred and fifty bacterial colonies. This drop was taken Saturday evening. The next evening, after numerous and crowded services, each drop yielded numerous colonies. The most important germs found were identical with the germ of diphtheria.

A temperance man having some standing timber for public sale decided that he would not furnish any drinks to the bidders, as was customary. The auctioneer remarked: "I am sorry. You will lose a great deal of money, for the trees look much larger to men after they have had a drink."

"A peculiar thing about alcohol," says Dr. Quine, of Chicago, "is that while it lessens the speed of the brain in thought, a person under the influence of liquor invariably has the opposite impression. Every conception of himself is magnified. He is easy to offend; he thinks himself an important person."

The czar of Russia, according to the *Home Journal*, goes out every morning as soon as it gets light, and runs a verst (about three-fifths of an English mile) in order to keep himself in good form. He carries his watch in his hand all the time, so as to see that there is no falling off from day to day in the matter of speed.

In a discussion of the attitude of the medical profession toward alcohol, reported in the *New York Medical Journal*, Dr. R. C. Newton said he believed that the candy shops did more harm than the liquor shops, and he did not see why, if men were to be kept from drinking liquor, children should not be kept from eating candies. He thought the abuse of sugar blunted the sensibilities, and was very bad for the digestion. It was one of the chief troubles physicians had to meet in treating chronic diseases of children, and was a direct bar to the physical and moral well-being of growing children. The child who ate candy excessively might

develop into a man who would drink liquor to excess. Children, in his opinion, form the very bad habit of not eating plain, wholesome food, of "turning up their noses" at it, because it is not seasoned enough or sweet enough. He declared that no young man or woman could have a worse heritage than a finicky appetite, a desire for highly spiced and seasoned food; that this very craving was the foundation for an alcoholic appetite.

Statistics show that five billion cigars and three billion seven hundred and fifty million cigarettes were smoked in this country during the last fiscal year. Assuming that there are twenty-five million males of smoking age, this means two hundred cigars and a hundred and fifty cigarettes for each one of them.

A Southern medical journal calls attention to the importance of teaching children the nature of infection, stating that it has been estimated that ninety-seven thousand people were killed and fatally wounded during the Civil War, while infectious diseases during the same period carried off one hundred and ninety-four thousand.

A prominent Armenian physician of New York City, Dr. M. S. Gabriel, in a letter published in the *Union Signal*, speaks of the use of liquors in a way to show that although he represents an Asiatic people, he takes advanced views upon one subject at least. He says in part: —

"Dr. Lancereaux, one of the greatest medical authorities of France, says that peasants who make a moderate use of wine are often affected by liver disease. This is very significant. The beverage accused is wine, the best of beverages, the one which most approaches food, and is wine pure and unfalsified, made of good grapes by the peasants themselves. It is used by peasants who are most of the time in the open air, working in the field and leading a natural existence. They never abuse wine to the point of drunkenness.

"Now, the conclusion which logically forces itself on our minds is this: If even pure wine, used moderately, and used by peasants, is apt, in the long run, to develop liver affection, how much more injurious must be the use of various liquors and wines which are more or less impure, by people living in cities and passing a great part of their time in stores and factories! Such use is in itself sufficient to degenerate a nation in a few generations."

The *British Medical Journal* states that more adults now die of smallpox than in the last century. Then the children were unprotected, now they are protected by vaccination. Then the adults were permanently protected by smallpox, now they have exchanged this permanent protection due to their survival of smallpox for the less complete protection due to vaccination, a protection which lapses with time. *Revaccination is absolutely necessary* to renew this protection. In England vaccination is a thing to be disputed about by local authorities. In Germany it is a serious matter which admits of no parley. Not only are negligent parents punished, but negligent public vaccinators are heavily fined, with the alternative of three months' imprisonment, and if their negligence is proved to have caused serious injury to the health of any child, the punishment is much greater. The report of the imperial health office in Berlin states that there should be vaccination in early childhood and again in early youth.

THE COCOANUT AT HOME.

NEXT to bananas the most important product of eastern Cuba is cocoanuts. The trees grow rapidly without cultivation, and every man's field is fringed with them. Fruiterers buy the nuts at the rate of eight dollars the thousand; and they are hulled on the island, ground in primitive mills, and pressed for oil.

The Cuban process of extracting oil from the cocoanut resembles that by which Texans make oil from cotton seed. The "cake" of solid residue is fed to the pigs — about the only "live stock" ever successfully raised in eastern Cuba,— and the shells are used for fuel in the sugar factories. So far the oil has been locally employed only as a lubricator for sugar-making machinery — a wicked waste of valuable material, it seems to those who are familiar with the splendid possibilities of the product. Here is an unequaled opening for the manufacturer of palm-oil soap, cocoa-fiber mats, hats, to say nothing of the hundred other uses to which parts of the tree, its fruit, and fibers, may be put. The saying goes that a cocoa-tree bears a nut for every day in the year.

In time of peace one might buy a dozen nuts for a twenty-cent coin anywhere in the rural districts of Cuba; and he who has never tasted the milk from one freshly gathered can have no idea what is meant by "a draft fit for the gods." In their proper state, however, the nuts are not brown and hard, as you see them in Northern markets; they look like enormous pale green apples, slightly elongated; for each still wears its Robin Hood jacket, which is removed before shipment. Being still "alive," as they say on the island, its shell is soft and easily cut with the machete, or long-bladed knife, which every countryman carries; or your own pocket knife may answer the purpose. Make a hole in one end of the nut about the size of a half dollar, and out gushes the milk like a living spring, not by any means such sour stuff as you have seen come out of cocoanuts at home, white as chalk and thick as buttermilk. Give an imported cocoanut to a monkey pining in captivity for its native food, and he will refuse it with scorn and indignation.

The trouble is that the cocoanuts of commerce are gathered before they are ripe, and are entirely spoiled in transit. The fluid within should have no suggestion of milk, but be colorless as water, with a slight sparkle like that from some clear mountain spring, except for a slightly sweet and most delicious flavor; and if freshly picked in the early morning, after the nut has been swinging all night in the cool breeze, the liquid is almost ice-cold. Where cocoanuts grow, you never see inside of their shells any of that hard, white layer which Northerners grate and "desiccate," or, as some one has pertinently suggested, "desecrate," for in its best estate the nut has no such substance; only a creamy white film inside of it, hardly thicker than your thumb-nail, which is scraped off with a spoon when eaten.

Before drinking the juice the novice generally pours it out into another vessel than that which nature intended; but the sophisticated epicure tilts the cocoanut at just the right angle to let the milk trickle gently down his throat. There is nothing in the world more nourishing or fattening, more health-restoring and youth-preserving. Emaciated invalids are recommended to begin on the juice of half a dozen nuts a day, the dose to be increased according to the patient's inclination. And the invalid is yet to be found who does not develop a taste for it so rapidly that in a week's time half a dozen nuts at a single sitting will hardly satisfy him.

Each full-grown nut contains nearly a pint of this true "fountain of youth," the same, perhaps, which the *conquistadores* sought vainly far and wide, expecting to find it gushing out of the earth in some sequestered spot, instead of hanging, green and beautiful, everywhere overhead.

The big nuts grow in bunches, five or six on a stem, away up near the top of the tall tree, just under its crown of plume-like leaves. A native, young or old, thinks nothing of springing up a smooth, branchless trunk, which looks like a telegraph pole, towering straight and slender from fifty to one hundred feet, knocking off the nuts with his machete, carried up in his teeth; and tossing them down with the ease and agility of his reputed ancestors, the monkeys. No cocoanut ever falls from the parent stem until it is too old and withered to be good for anything. The poorest denizen of the tropics would disdain to eat such windfalls, and so they are shipped to the North, to be eaten by those who know no better!

HYDROTHERAPY ONE HUNDRED AND FIFTY YEARS AGO.

J. H. KELLOGG, M. D.

THOSE who imagine that hydrotherapy, or the use of water, is a modern innovation, are certainly unacquainted with the history of that versatile, and, we may also say, most important and valuable of all therapeutic measures, common water. Water is, without question, the most ancient of known remedies. It was used by the early Egyptians, the Jews, the Greeks, the Romans, the Aryans, and their modern representatives, the Hindus and Persians; likewise by the Chinese and Japanese; in fact, it has been used by all primitive peoples, ancient and modern. The earliest physicians, among whom were Hippocrates, Pythagoras, and Asclepiades or Æsculapius, depended upon water more than upon any other agent for the treatment of fevers and other grave maladies.

While Europe slumbered in the darkness of the Middle Ages, the Arabian physicians, to whom we are indebted for much that is best in our modern system of rational and scientific medicine, were practising and teaching the use of water by methods as thoroughly scientific as any employed at the present time.

Medical history gives us very little account of the rise and progress of hydropathy, but from non-medical sources we have become acquainted with the fact that all along during the centuries, when European medicine had become almost altogether artificial and irrational,—a mere medley of maxims without even the semblance of systematic order, or of the logical relation between the remedies administered and the cures supposed to be wrought,—the common people still preserved, especially in out-of-the way country places, where the humble peasantry were rarely so fortunate, or unfortunate, as the case might be, as to be able to secure the services of a recognized physician, a knowledge of the use of water in the treatment of a great number of common ills.

Numerous writers within the last two centuries, among others, Floyer and Sir John Sinclair, have gathered facts which present indubitable evidences of the wide-

spread use of water in a great variety of ways by the laity, long before the time of Jackson, Currie, or Priessnitz, to whose efforts we are so largely indebted for the scientific knowledge of the value of this physiological remedy for disease.

Perhaps the most striking evidence of the existence among the common people of a great fund of information respecting the use of water is afforded by a unique work entitled "Primitive Physick," written by John Wesley, the famous founder of Methodism, in the year 1747. In this work, Mr. Wesley presents a considerable list of the popular remedies which he found in use. Many editions of this work were published during Mr. Wesley's lifetime. As illustrating the very practical character of his recommendations concerning the use of water, we quote a few paragraphs which we find scattered through the interesting work referred to: —

For Ague, or Intermittent Fever. — "Enter a cold bath just before the cold fit;" or, "drink a quart of cold water just before the cold fit, and then go to bed and sweat."

For a Tertian Ague. — It is recommended to "use light and sparing diet on the day between," or "use the cold bath (unless you are of advanced age or extremely weak), but when you use this on any account whatever, it is proper to go in cool, to immerge at once, but not head foremost, to stay in only two or three minutes (or less at first), never to bathe on a full stomach, to bathe twice a week at least until you bathe nine or ten times, to sweat immediately after it (going to bed), in palsies, rickets, etc." Before the cold fit begins, "go to bed and continue a large sweat by drinking lemonade for six or eight hours. This usually cures in three or four times. If it does not, use the cold bath between fits."

For Apoplexy. — "To prevent, use the cold bath and drink only water."

For Asthma. — "Take a pint of cold water every morning, wash the head therein immediately after, and use the cold bath once a fortnight. For present relief, vomit with a quart or more of warm water; the more you drink of it, the better."

For Dry or Convulsive Asthma. — "Use the cold bath thrice a week."

To Prevent Swelling from a Bruise. — "Immediately apply a cloth five or six times doubled, dipped in cold water, and new dip when it grows warm."

To Cure a Swelling from a Bruise. — "Foment it half an hour morning and evening with cloths dipped in water as hot as you can bear."

For a Burn or Scald. — "Immediately plunge the part in cold water. Keep it in an hour; if not well before, perhaps four or five hours."

To Prevent Rickets, Tenderness, Weakness (in children). — "Dip them in cold water every morning, at least until they are eight or nine months old."

For Whooping-Cough. — "Use the cold bath daily."

For Cholera Morbus. — "Drink two or three quarts of cold water, if strong, or of warm water, if weak."

For a Cold. — "Drink a pint of cold water, lying down in bed."

For Colic. — "Drink a pint of cold water or a quart of warm water, or apply hot water in a bladder, or steep the legs in hot water, a quarter of an hour."

For Hysteric Colic. — "Use the cold bath. The cold bath two and twenty times a month has entirely cured hysteric colic fits and convulsive motions."

For Nervous Colic. — "Use the cold bath daily for three or four weeks."

For Convulsions. — "Use the cold bath."

To Prevent Corns. — "Wash the feet in cold water."

For a Cough. — "Drink a pint of cold water lying down in bed, or use the cold

HEAD BATH.

SITTING BATH.

DOUCHE BATH.

HALF BATH.

SWEATING.

GOING TO THE BATH AFTER SWEATING.

bath, or wash the head in cold water every morning."

Blindness "is often cured by cold bathing."

For Weak Eyes.— "Wash the head daily with cold water."

For a Slow Fever.— "Use the cold bath for two or three weeks daily."

For Hectic Fever.— "Drink only thin water gruel or boiled milk and water."

For Intermittent Fever.— "Drink warm lemonade in the beginning of every fit. It cures in a few days."

Sitz Bath for Fistula.— "Have the vessel so contrived that he may sit with the part in cold water a quarter of an hour every morning."

For Flux.— "Drink two or three quarts of warm water."

For Bloody Flux.— "A person was cured in one day by feeding on rice milk and sitting a quarter of an hour in a shallow tub having in it warm water three inches deep. Drink water largely; take nothing else until the flux stops."

Leg Bath.— "At six in the evening, wrap yourself in blankets, then put your legs in water up to the knees, as hot as you can bear it. Keep in a sound sweat until ten, then go into a bed well warmed, and sweat until morning. I have known this cure an inveterate gout in a person above sixty."

For the Gravel.— "Drink largely of warm water."

For Chronic Headache.— "Keep your feet in warm water a quarter of an hour before you go to bed, for two or three weeks."

For Headache from Heat.— "Apply to the forehead cloths dipped in cold water, for an hour."

For Heartburn.— "Drink a pint of cold water."

For the Hiccough.— "Swallow a mouthful of water, stopping the mouth and ears."

For Hoarseness.— "Take a pint of cold water, lying down."

For Hypochondria.— "Use cold bathing."

For One Seemingly Killed by Lightning or Suffocation.— "Plunge him immediately into cold water."

For Mania.— "Apply cloths dipped in cold water, to the head, or pour cold water on head from a teakettle, or let the patient eat nothing but apples for a month."

For the Measles.— "Drink only thin water gruel, or milk and water, the more the better, or toast in water."

For Palsy of the Hands.— "Wash them often in a decoction of sage, as hot as you can bear."

For Palsy from Working with White Lead.— "Use warm baths and milk diet."

For Palpitation or Beating of the Heart.— "Drink a pint of cold water."

To Prevent Piles.— "Wash the parts often with cold water."

For the Plague.— "Cold water alone, drunk largely, has cured it."

An Easy Purge.— "Drink a pint of warmish water, fasting, walking after it."

For Rheumatism.— "Use the cold bath, rubbing and sweating."

For Rickets.— "Wash the child in the morning with cold water."

For Rupture.— "Foment the part for half an hour with cloths four times doubled, steeped in cold water, gently touching it with the fingers. Afterward keep on it, many times doubled, a cloth shaped like a triangle, wet in cold water."

For Sciatica.— "Use the cold bath and sweat, together with the flesh brush twice a day. Drink half a pint early in the morning and in the afternoon."

For Smallpox.— "Drink largely of toast in water."

For Sore Throat.— "Take a pint of cold water, lying down in bed."

For Stone.— "To prevent its occurrence, drink a pint of warm water daily just before dinner.

To Stop Profuse Sweating.— "Drink largely of cold water."

For Swelling Glands in the Neck.— "Pour on the part daily a stream of warm water or a stream of cold water one day and warm water the next."

For the Toothache.— "Keep the feet in cold water and rub with bran just before bedtime."

For Numbness of the Limbs.— "Use the cold bath, rubbing and sweating."

For "Swimming in the Head."— "Use the cold bath for a month."

For Ulcer.— "Foment morning and evening with a decoction of warm tea leaves."

Varicose Ulcer of the Legs.— "Cured by constant cold bathing."

Weakness of the Ankles.— "Cold water poured on morning and evening."

For Wounds.— "Keep the part in cold water for an hour."

Wesley recommended cold bathing for the cure of nearly all the affections of childhood, all chronic diseases, and many surgical cases.

Rain or soft water was considered the best, and water drinking was recommended as a means of preventing apoplexy, asthma, convulsions, gout, hysteria, palsies, and strong trembling.

The accompanying cuts are copied from old works on hydrotherapy, and illustrate the crude means employed in the early days of this science. In future numbers we will contrast with these, illustrations of the more convenient appliances employed in modern hydrotherapy. In our next number we will discuss the methods of Priessnitz and Pastor Kneipp, which are now coming to be known to some extent in this country as well as in Europe.

THE HYGIENE OF LOVE.—NO 3.

MRS. S. M. I. HENRY.

HOMESICKNESS and love-sickness are synonymous terms, or rather two names for the same disease, than which none is more fatal, for it possesses the power to make the most simple ailment malignant, and to give destructive energy to the disease germs that have lain dormant through generations of hereditary transmission. Love is the only home maker. Love can never be homeless, for where love is there is always home.

No one can be homesick who has love, for love is companionship. It is capable of annihilating space, and by its courageous faith bringing and keeping all who are dear to each other so consciously near that a sense of aloneness, homelessness, is impossible. It is love, imperfect love, broken down, that makes homesickness and love-sickness break out.

If those whom we love fail us, yet love never fails; and while sorrow and disappointment may befall because of the breaking of the beautiful globe of human friendship, which has surrounded the flame of our lamp, yet we shall find that the light remains, and is all the more clear because that which shaded it lies in fragments at our feet.

Shades are cheap, can often be bought for a song; but light is priceless, and love is light. In love there is no darkness and no loneliness at all.

The home of Love is always Eden; and to lose the one necessarily involves the loss of the other; while to regain the one inevitably restores the other; but the path to restoration must be backward over the way by which came the loss.

Self must surrender to God; faith must supercede questioning; social and domestic relations must be regulated according to the standards given in the word of God, as written in all nature, and confirmed by revelation; and the channels of thought must be cleansed by the processes of a true education. If men and women would know love and bequeath it to their children, every demand of appetite must be met, in harmony with law, and for the one only purpose for which it was designed.

The fleshly appetite, chastened, corrected, and reduced to its natural proportions, is intended to be the medium of the divinest possible ministry of God to man. Wouldst thou know love, that thou mayest be its blessed minister to thine own home and children? then in the language of the Book, thou must "loose the bands of wickedness," "undo the heavy burdens," "let the oppressed go free," "break every yoke," "deal thy bread to the hungry," "bring the poor that are cast out to thine house," cover the naked, hide not from the needs of thine own flesh. And, in the day that this shall be performed toward thine own soul and body,—toward those who suffer from thine influence, or those who are dependent upon thy safe leading,— then shall thine "health spring forth speedily" and the "glory of the Lord," which is his love, "shall be thy rereward."

We find the most perfect and beautiful representation of the Eternal One himself in that consecrated home life where the secret of love has been revealed. In such a home the members "submit themselves one to another in the fear of God" [*i. e.*, reverence for the life of God that is in one another]; for it is remembered by each that the other is a member of the body of Christ, is "of his flesh and of his bones."

Christ manifest in the flesh must always command reverence; while manifested in

theory only, his name provokes controversy. Even the avowed infidel has no quarrel with the principles for which Christ stands, when they are practically lived out by the people with whom he must have to do. One such said: "It is very comfortable living with a wife like mine; for she has the kind of Christ in her religion that will not allow her to talk back, and makes her take patiently all I give her; and the consequence is I have to be better to her than I would naturally be, for a man must be meaner than I care to be to crucify over and over that Christ."

A man whose life of soul and body is all lived according to hygienic principles will make a safe "head," and the woman, by the same token will be always the true and tender heart of the home, which the head, as well as the whole body, can trust.

Nothing in human experience can be so inspiring to energy and high endeavor as love; nothing can so nerve the arm and give wings to the feet. Its effect is always tonic; its manifestations clothe even small endeavors with sublimity; it has the power of making anything important, no matter how insignificant it may be in itself, of imparting grace to the most unlovely, and making the most contemptible worth dying for.

Contentment is everywhere recognized as necessary to health and vigor; and love is the greatest producer of contentment. In truth, there can be no contentment without love, and no discontent where love holds sway.

Love is the only healer,— the great physician before whose power all disease must sooner or later be swept away. Manifested in the flesh, Love walked up and down all Judea eighteen hundred years ago, and left the people whom he found sick and lame, blind and dumb, and possessed of devils, leaping and singing behind him, in the joy of perfect health.

This is the same Love that would take possession of the heart of man and woman in the pure vigor of their youth, and bind them into that one beautiful, symmetrical unit upon which the home depends, and which is demanded for the preservation of society, and the work of both church and state. Let it but have a chance in the heart of humanity that is breaking under the burden of many sorrows, and strength for every emergency will develop.

Mental disorder exists because love is lacking, and fears which have torment abound in proportion. But fears can not exist in the presence of love. A bogus love is the witch-mother of useless terrors, but perfect love casts out every fear of forgetfulness or disloyalty, and gives that quietness and confidence that is strength.

Love makes no wrinkles; they are not the necessary products of years. Who can imagine the most aged one of all the heavenly hosts as furrowed and scarred by these misnamed "marks of time"? Shall the inhabitants of the New Earth put on wrinkles by which to count off the eternal ages of an immortal life?—Nay, verily. Every wrinkle is left to mark the track worn by the wheels of war and worry, and the teeth of the harrow of remorseless lust. Love would forever keep the beloved all glorious, without blemish, "not having spot, or wrinkle, or any such thing." He is "the Saviour of the body." When Love finds wrinkles that must wait for the resurrection touch to smooth away, he will make them so luminous that they shall be recognized only as waves of light and channels of consolation. Upon the same principles by which a crown of glory can be made out of gray hairs, love will glorify all wrinkles, which for the time being must be worn, until they have told their story, taught their lesson, and can be put away with all the other reminders of the presence of the destroyers in the earth.

Jealousy is a necessary ingredient of love, but everything depends upon the end which it is made to serve. Lust is jealous for its own gratification alone; love, only for the highest happiness of another. Lustful jealousy is a fever that burns the life out, while the jealousy of love is an ambition to serve which imparts almost limitless powers of endurance, and gives a joy in sacrifice such as no libertine ever realized in the most coveted indulgence.

It was the greed and discontent of lust that divided the social and domestic world into hemispheres, and which set men and women to looking at each other only as male and female of the species, than which nothing has ever been more productive of misery to both mind and body.

"The unity of the Spirit in the bond of peace" is the only remedy for those conditions which have made the world like one great hospital or insane ward.

To learn how to love is to learn how to be in health; to be in health is to know how to love, and to love is to come back to Eden, and to hear again the voice of the Lord God walking in the garden in the cool of the day; not, however, burdened with reproof, as in that early time, but in fellowship, as friend would walk with friend. And that presence, that voice, that friend, would be the Spirit of God manifested in the flesh, your own flesh, who have learned to love. And now, "beloved, I wish above all things that thou mayest prosper and be in health, even as thy soul prospereth."

INFANT FEEDING—EXTERNAL INFLUENCES.

KATE LINDSAY, M. D.

"WARPED by colic and wet by tears,
Punctured by pins and tortured by fears,—
What does ail the baby?"

This cry is going up all over the earth from babies who make life a nightmare to mothers and nurses, because no one tries to find out what ails them, or to make them more comfortable by removing the causes of their restlessness.

The causes which produce indigestion in the adult are receiving attention through the medium of the press everywhere. The business man is warned that if he lives such a hurried life of worry, fret, and care, and does not take time properly to masticate his food, he will surely have dyspepsia, his life work will come to an end, and he will succumb to the weakness and disability of a stomach worn out prematurely because it was compelled to digest food when tired, to masticate as well as dissolve the food elements, to take care of more food than it was capable of holding, and to deal with poisons or foods in a form that it could make no use of, and which would only set up fermentation, thus feeding the tissues with poisons instead of with proper food elements.

We who are living in the latter end of the nineteenth century look back with complacency on the follies and superstitions of past ages; yet that very past broods like a grim specter over the present. Science, which professes to deal with facts, gives no better evidence for many of her so-called facts than the results of the bad habits of our ancestors

The most effective argument put forth for the use of alcohol and tobacco, opium, tea and coffee, and other stimulants and narcotics, is that mankind must need them for some purpose, because they have always been used.

The statement is made, and in good faith, in most physiologies, that boys and girls have the same type of breathing — lower costal — until the girls reach the age of twelve or fourteen years, when in them it changes to upper costal; therefore the supposition is made that upper costal breathing is normal for women and lower costal for men. But the fact is, both men and women have the same type of breathing under like conditions. The woman, untrammeled, in a state of nature, expands the lower part of her thorax, and the man in corsets uses the upper part of the chest most freely.

Many other points might be brought forward to show that what are called scientific facts are only precedents collected and clothed with the name of science. It is not to be wondered at if the helpless part of mankind has been made to suffer much from this cause.

The careful driver knows that if his horses are allowed to cool off too rapidly after hard driving, or are fed grain and watered at once, before they have had time to rest, he will have founder to deal with the next day, and the gallant steeds that were the owner's pride will settle down into a pair of stiff-jointed old hacks, crawling about with drooping heads and dejected mien.

Science and common sense have certainly done much in the selection of the horse dietary as regards external influences, and as far as adults are concerned, most people admit that good digestion demands not only proper food, but also a proper preparation of the body to enable it to take care of and make good use of the food.

Now if it requires rest of nerve and muscle for a man or a horse to digest food properly, and if there is danger if such precautions are neglected, how much more must the delicate, unstable constitution and structures of little human beings suffer, if fed at times when tranquillity of the nervous system and repose of the body are wanting.

To have all the organs of the body testify that they approve of the way they are fed, not only must the aliment be supplied, but the little organism must be put in the right condition to take care of the food. This is done by giving it the proper treatment both before and after eating.

In the case of infants and small children, it seems never to have occurred to any one, not even the doctors, to inquire whether the fretful, frightened, tired (for babies become tired very easily), sick, nervous infant can digest food. Is the little one angry? Is it purple in the face from an outburst of infantile fury? Take it up, while it is fighting and struggling, and force the breast or nursing bottle into its mouth to pacify it! Is it stiff and all cramped up with colic, screaming with indigestion, and fighting with all its little might for relief? Quiet it by holding its wriggling form still until it is compelled to nurse again! More milk in the stomach means more fermentation, more gas, more colic.

Every one knows that it is not well to eat a meal while the feet are cold, or when one is cold or damp and uncomfortable from any cause; yet all seem to forget that the baby can suffer from the same causes that afflict the adult. When the little one frets because it is wet and cold, or uncomfortable from soiled napkins or tight bands, the pricking of pins, or any other abuse infantile flesh is heir to, it is sure to have its sufferings increased by stomach cramming.

A short time ago the writer saw an infant crying frantically with colic pain. Upon investigation it was found that its band had slipped up until the lower edge came over the middle of the abdomen, and had formed a deep crease, while above and below this constriction the gas

had accumulated until the abdomen appeared as if it were blown up. When the band was unpinned and the pressure removed, the little one uttered a sigh of relief, and a gentle rubbing soon transformed it from a screaming, twisting bundle to a cooing, happy baby. The mother of this child professed to love her little one, yet no inquisitor of old ever put his victim to a more refined method of torture. Inquiry as to how the baby was fed elicited the remark from this mother, that when the baby felt well, it never nursed more than once in the night; but when it had the colic, she had to let it nurse so much that it had nearly worn her out, and it must have its bottle almost constantly when it was awake through the day.

It is best to feed a child regularly; and when its time for feeding comes, do not make it wait for anything. When a healthy baby begins to fret, it is uncomfortable, and should be attended to immediately. Do not wait until it screams before noticing it. It will soon learn to cry when it wants anything, as the surest means of getting it. If it is impossible to feed it promptly, and it becomes irritated and angry, try to divert it until it is quiet, and then feed it.

Bottle-fed babies usually eat too fast, because they are given the bottle while lying in such a position that they must either swallow or choke, the milk comes so fast. To feed a baby, nature should be imitated. The nurse or mother should take the little one into her lap, and feed it as the babe feeds from the breast, giving it frequent resting spells.

It is a well-known fact that at the end of three or four months most babies begin to have a more or less free flow of saliva from the mouth. This is supposed to be an indication of the approach of teething; it surely is an indication that the salivary glands have so far developed that they are capable of forming their secretion when excited by some stimulus. Now if chewing tobacco or gum will produce drooling in the adult, why should not the stimulus of continued suction incite to excess of saliva in the infant? The writer has often seen what was called a teething baby with a wet, cold, dirty bib under its chin, and has come to the conclusion that this state of affairs, like crying, vomiting, or the colic, is useless. It is simply a sign of abnormal excitation of the salivary glands, and is caused by the almost universal habit of teaching the infant to put everything in its mouth, and to keep up the action of suction after the demand for it has ceased with the taking of the meal. This habit also uses up the blood and the nerve energy needed to keep up the digestive work in the stomach, to say nothing of the dirt and germs that are put into the mouth with articles gathered from the floor. It also creates a perverted appetite, to satisfy which something is demanded that will call for constant chewing. The demand for the dumb nipple creates a demand for chewing-gum, the cigarette, the cigar, the pipe. These in turn beget a demand for strong drink.

Besides the overaction of the salivary glands induced by constant suction, there are many conditions of the mouth which tend to produce excessive salivation, and which should be treated and the causes removed. It is just as important to keep the baby's mouth free from foul germs as it is to have the milk clean and aseptic.

I hear some mother say, "Well, what are we going to do? Baby will chew or suck something, even if it is only his fingers." Of course he will, when everybody is encouraging him to do it. But, on the other hand, just try the other way: As soon as he begins to notice things, remove all articles that will remind him of suckling as soon as he has finished his meal, and set before him some object that

will attract his attention, as a bright-colored ball. It will amuse him just as much if it is placed out of reach of the eager hands. You will be surprised to find that instead of going into the mouth, the little hands will reach out after the bright object.

Teach him to use his mouth only for eating when he needs food, and by no means to misuse it by useless work. If he still persists in putting the little fist in his mouth, gently restrain it until he forgets about the nursing, which he will soon do if he is made comfortable and given something else to think about. You will be surprised to find how soon the habit is formed of desiring to nurse only when normally stimulated by the demands of the body for food, and the natural stimulus of the nipple.

It will be found an easy task to prevent the formation of the bad habit of finger sucking, compared with the fight and the suffering for both mother and child which follow the attempt to break up this filthy, disease-producing habit. Think of the scoldings, the whippings, the tying up of hands, the smearing of the fingers with bitter-tasting drugs, which are resorted to, and often without accomplishing the desired result. The disturbance of the nervous system caused by the breaking up of the habit indicates how much it has been deranged by the unnatural habit. The writer has seen a five-year-old child unable to sleep for hours when trying to overcome the habit of going to sleep with the fingers in the mouth. Children often become as nervous and irritable as a toper leaving off his accustomed night-cap, or a nicotine victim his favorite cigar.

All this distress may be avoided if pains is taken not to let the child form the habit of sucking its fingers. A few days ago the writer saw a nine-months-old baby playing with a newspaper, and it never in any way offered to put it in its mouth. On inquiry it was learned that the baby had from its birth been taught to use its mouth only for eating, and now it fully repaid the care thus given it by the sense of security on the part of its parents that it would not be likely to poison itself to death.

"It is too much trouble to mind all these things," say so many mothers. But let these remember that such work once well done is done forever. Not only will this painstaking save the infant much suffering, but it will be a safeguard of its morals in after life. The old story of the fall of man is only a story of useless eating. The little one restrained from needless suckling will not be tempted to put everything into its mouth when older. May we not hope that in after life this habit formed in youth of eating for strength and not for drunkenness may be a safeguard against strong drink, tobacco, and other evils?

Not only should the little ones be in proper condition to take food before meals, but they should also be properly treated after meals, in order that the food may digest. When the mouth has gotten through with its task of suction, which in the adult is equivalent to chewing, it should be allowed to rest. Do not think you must have some convenient dumb nipple or other rubber contrivance, or a sugar-teat, or anything else to induce the baby to keep up the nursing movement after its stomach is full and its hunger satisfied. Nor should you think it necessary to rock or trot the child. Every one knows how the rocking of a boat often deranges the digestion of adults; rocking the cradle or trotting the baby has the same effect on the little one. After you are sure it has forgotten its desire for useless suckling, make it comfortable, and leave it alone. Being clean, dry, and warm, the little one will soon drop off to sleep.

Seasonable Bills of Fare.

MRS. E. E. KELLOGG.

BREAKFAST NO. 1.

Pears

Granose Flakes with Grape Sauce

Corn Dodgers

Hot Malted Nuts with Zwieback

Stewed Nuttose with Tomato

DINNER NO. 1.

Vegetable Pea Soup

Baked Sweet Potato

Cauliflower with Tomato Sauce

Green Corn on Cob, with Nuttolene

Celery

Whole-Wheat Bread

Toasted Granose Biscuit with Nuttolene

Sliced Peaches

BREAKFAST NO. 2.

Grapes

Wheatose with Cream

Potato Cakes with Broiled Nuttose

Water Graham Puffs

Sliced Tomato

DINNER NO. 2.

Corn Soup

Mashed Potato

Sliced Tomato Savory Lentils

Pearled Wheat with Grape Sauce

Zwieback

Whole-Wheat Bread with Nuttolene

Stewed Fruit

Apple Tart

Corn Dodgers.— Scald one cupful of best granular corn-meal, with which a teaspoonful of sugar and one fourth of a teaspoonful of salt have been sifted, with one cup of boiling milk. Beat until smooth, drop on a griddle in cakes about one inch thick, and bake slowly one hour. Turn when brown.

Into one cup of very cold water — in which are lumps of ice, if obtainable — beat one egg, a pinch of salt, and two cups of sifted graham flour. Continue beating until the batter is full of air bubbles, then drop into warm, not hot, gem-irons, and bake in a rather hot oven about forty-five minutes, or until dry inside. By varying the flour, whole-wheat and corn puffs may also be made. For the corn puffs use one half white flour. A small amount of it may be used in the graham puffs.

Potato Cakes.— Make nicely seasoned, cold mashed potato into small round cakes about one half an inch thick. Put them on a baking tin, brush them over with sweet cream, and bake in a hot oven till golden brown.

Broiled Nuttose.— Cut nuttose into slices about one third of an inch thick, and broil in a wire broiler over a fire not too hot, until of a delicate brown on both sides; serve at once. The nuttose may be spread with nut butter and sprinkled with salt after broiling.

Vegetable Pea Soup.— Cook a pint of split peas until dissolved. When nearly done, put to cooking one and one-half pints of sliced potato and one medium-sized onion, sliced thin. When tender, rub all through a colander, add water to make of the consistency of thin cream, and salt to taste Reheat and serve.

Cauliflower with Tomato Sauce.— Boil or steam the cauliflower until tender. In another dish prepare a sauce with a pint of strained stewed tomatoes heated

to boiling, thickened with a tablespoonful of flour rubbed smooth in a little water, and salted to taste. When the cauliflower is tender, dish and pour over it the hot tomato sauce. If preferred, a tablespoonful of thick sweet cream may be added to the sauce before using.

Apple Tart.— Mix together one and one-fourth parts flour to one part nut meal. Make into a dough with cold water. Knead only just enough to form; roll out lightly about one fourth of an inch thick, and shape over sliced tart apples spread two inches deep in a pudding-dish. Bake until well done in a moderate oven. Serve with almond cream, sweetened, or with malted nut cream.

BATTLE CREEK SANITARIUM QUESTION BOX.

ANSWERS BY J. H. KELLOGG, M. D.

1. PLEASE give your opinion of vaccination as a preventive of smallpox.

Ans.— Vaccination unquestionably has a controlling influence over smallpox, for if a person who has been exposed to smallpox, and has really been infected with the germs of that disease, is immediately vaccinated, and the vaccination "works," as it is termed, the vaccination gets the start of the smallpox so that it will not appear. This has been shown in a great number of cases. It is generally true that when a person has been exposed to smallpox and is immediately vaccinated successfully, he does not have the smallpox. Vaccination is a good protection against smallpox, but not a perfect one. A better way is to keep away from it. The best protection against smallpox is to live above it. I believe it is possible for a human being to be kept in such a perfect state of health that no disease can successfully attack him.

2. Is it right to be vaccinated, thus polluting our bodies with disease?

Ans.— If we were all living in a state of immaculate purity and innocence, if we never violated the laws of nature, it would be a gross insult to nature to be vaccinated. But when we live largely upon offal and corpses, and that is about all you find on many tables, I think we ought not to be squeamish about vaccination, because vaccination is simply infecting ourselves with a very mild and harmless disease for the sake of avoiding a dangerous one. Vaccination with human virus, however, was long ago universally condemned, because the human family has become so thoroughly infected with disease that it is not safe for one human being to mix his blood with that of another. Even the virus of children is not safe, because human blood is so thoroughly infected with disease. But the infection from the vaccine of a healthy calf is simple and harmless when perfect asepsis is secured. Before we knew anything about asepsis, there was danger of producing infection by vaccination. It was supposed that if the arm swelled and the patient was sick after vaccination, it was "working" very well, but this was simply the result of blood poisoning from an old scab; we have now found that it is a most heinous thing for a physician to use an old scab in vaccination. One should be vaccinated with pure lymph, which is almost as colorless as water; then there will be no swelling and no abscess. I mention these facts so that you will see that the prejudice which exists against vaccination is not caused by vaccina

ting in the right way, but applies to the old method of vaccinating with human virus, and the modern method of vaccination by the use of dirty bovine virus, which is full of poisonous germs. There is no objection to vaccination when properly performed with the use of pure vaccine virus.

3. What are the symptoms of and the cure for intestinal indigestion?

Ans.— This, I think, refers to what Dr. Oliver Wendell Holmes called "peristaltic woes." One symptom is the crying of a baby that keeps everybody in its neighborhood awake; this is a very common symptom. Intestinal indigestion affects the nervous system in an emphatic manner; that is why a baby having intestinal dyspepsia can not keep still. Older people who have it can not keep still; they keep crossing one leg over the other, and shuffling their feet about on the floor, — they have the "fidgets." There are many other symptoms, among which swelling of the abdomen is common. Intestinal indigestion is caused by fermentation produced by germs in the intestinal canal; they pass into the alimentary canal through the mouth. A baby at birth has no germs in its stomach or intestines, and if he could always live so that no germs could get in through the open door of the mouth, he would never have intestinal indigestion. The baby has no indigestion the first day of its life. It is only after the nurse begins to feed it sugar and water, fats and milk, that its "peristaltic woes" begin. The germs which are thus brought in, in addition to those contained in the air that is breathed, mingle with the contents of the alimentary canal, and then the trouble begins. If a child could be brought up in an atmosphere entirely free from germs, it would have no intestinal indigestion.

Since intestinal indigestion begins at the mouth, it follows that the way to cure it is to begin at the mouth. One should eat things that do not contain germs and that do not encourage their growth. One of the things that encourage the growth of germs is a compost-heap, and if we make compost-heaps of our stomachs, germs will multiply there; people sometimes make compost-heaps of their stomachs by the kind of food they swallow, such as meat, cheese, decomposing fruit, oysters. If the stomach is already clean, we must live so as to keep it clean; if not, it should be washed out, cleansed, and then kept clean.

4. Is an undersized liver common? Does it imply the retention in the body of an unusual amount of poisons? Would it throw extra work on the kidneys?

Ans.— Yes, it is common with some people, especially hard drinkers. Sometimes a small liver is the result of indigestion. It has been found in modern times that the drunkard does not have a monopoly on diseased liver; the chronic dispeptic is just as likely to have a small liver as the drunkard. If the liver were diseased, the natural poisons would accumulate in the body; hence a person with a small or diseased liver must be very careful with his diet. This condition throws extra work upon the kidneys, because when the liver is weak, it does not thoroughly oxidize the uric acids and urates and reduce them to a harmless form, in which they can be eliminated by the kidneys.

5. Is Bright's disease caused by stomach trouble, or vice versa?

Ans.— It results from indigestion in many cases, and also from the long-continued use of tea, coffee, and alcohol. Dr. Haig, of England, and other investigators have studied this subject with great care, and state positively that tea- and coffee-drinking and meat-eating are the great causes of Bright's disease, as

well as of rheumatism, gout, nervousness, nervous dyspepsia, premature old age, and a good many other diseases.

6. Is it harmful just to taste of fruit and other trifles between meals?

Ans.— I suppose if one should only take a "taste" between meals once a year, it would do him no harm. But the difficulty is that one gets in the habit of nibbling at something between meals, of having something in his mouth all the time. So I think it is better to adopt the rule, "taste not" of food, except at mealtime and at the table.

7. Do you consider the mushroom a good food?

Ans.— It is not good, and it is not extremely bad; but the mushroom grows in an unwholesome place, and the associations are not appetizing, so I think, upon the whole, it should be discarded.

8. What causes almost continual sharp pains across the upper part of the abdomen.

Ans.— This person may be suffering from hyperpepsia. Perhaps the best thing would be to apply a hot spray followed by a moist abdominal bandage to be worn during the night. Probably the diet is also incorrect.

9. What is the cause of, and what is the cure for, hay fever?

Ans.— Hay fever is due to germs. But here again the germs are perfectly harmless, provided there is not a weakened condition of the tissues. The real cause of this trouble is chronic catarrh of the nasal cavity. Through the action of germs which have lodged in this part, causing irritation, the tissues have lost their power of resistance. Cure the catarrh by proper treatment and diet, and the germs will have no power for mischief.

10. Please tell us how you secure wholesome food in place of the ordinary menu at hotels while traveling.

Ans.— I have adopted several plans. One plan is, to keep away from hotels; that is the safest way. I patronize my own lunch-counter. I start on a journey with a full lunch-bag, and when I come to depots of health foods, I replenish it. When I stop at a hotel at night, I pay a dollar for my bed and breakfast, and furnish my own breakfast. I would rather pay for my breakfast at a hotel and have that breakfast go into the garbage box, where it belongs, than to have it go into my stomach. Some people pay a dollar to get a hotel breakfast into their stomachs, and then pay another dollar to get it out. It is better to keep it out. In several of our American cities there are very sensible hotels conducted on the European plan. Not finding these, you can stay at a hotel and board at a restaurant, where by care you can select comparatively wholesome food.

11. Will you please tell us if a chicken raised in an incubator and fed on granose has germs?

Ans.— I am glad to find that some one has a sensitive conscience on the subject of germs,— so much so that he proposes to have chickens raised in incubators and fed on sterilized food. If he would have them hatched in an incubator and feed them by hand every morning, by the time they are large enough to eat, I do not think he could be induced to kill and eat them.

12. What is the cause of dizziness in an otherwise healthy elderly person?

Ans.— It may be due to a shriveling of the arteries,— the result of advanced age. It may be due to a weak heart. It may be due to indigestion resulting in an irritation of the sympathetic nerves.

How Pope Leo Lives.

That the present pope has lived almost to his ninetieth year and has remained equal to the great demands of his office, is due to his close regard for the most exacting laws of health and hygiene. When he was elected to his office in 1878, he was almost seventy years old. Although neither robust nor strong, he instantly began to astonish the world by his great capacity for work. But in spite of the most exacting demands of his responsible position, he has persistently observed the most simple and commonplace rules in his every-day life.

His rooms are few and severely plain. His life is methodical and his meals, according to the law of the church, are eaten alone. His library, with its bookcases of white and gold, its pillars and screens, and its outlook upon the piazza of St. Peter, is his favorite room. He rises regularly at seven o'clock, and makes his toilet with the help of his valet.

After he has put on his pure white vestments and his heavy gold cross studded with diamonds, he says mass in his private chapel and then listens to mass himself. Then comes the reception of the pilgrims who may be awaiting him. Promptly at nine o'clock he takes a cup of broth, and at ten o'clock receives Cardinal Rampolla, his secretary of state. At this audience are discussed the weighty and perplexing problems of the government of the church and its relations with the temporal powers of the world. In addition, he personally superintends the expenditures of the Vatican, which amount to almost four thousand dollars a day. It is interesting to note in this connection that the pope's personal expenses amount to less than two francs (about forty cents) a day.

At noon Leo receives the notable visitors to the Vatican, such as ambassadors and princes. If he has any spare time, it is devoted to literary work, in which he still takes the greatest interest. At two o'clock he dines, simply and abstemiously. Later he goes into the gardens of the Vatican, where he finds recreation and seclusion in a picturesque wilderness. He gives considerable attention to horticultural affairs, and apparently enjoys this diversion. At nine o'clock he recites his rosary and goes to bed, after partaking of a light supper of fruit.

This simple routine of Pope Leo's life has been followed with almost absolute exactness for twenty years. To his own abstemiousness and exactness, together with the watchful attention of his attendant, Pio Centra, the long-continued health and vigor of the pope are generally attributed.

Violations of Visual Hygiene.

Some abuses of the laws of visual hygiene are considered by S. Busby Allen, M. D., in the New York *Medical Journal*. He shows that many people suffer from using the eyes with incorrect and insufficient illumination, from too prolonged use of the eyes, and from reading bad print. Upon the latter point he says: —

"'Marcella' and a cake of soap for five cents' was the sign displayed in a basket containing these articles in one of our department stores. Fiction, history, poetry, biography — all the standard works may be purchased at fifty cents a volume or even cheaper. To a man who loves a book there is something excessively offensive in these reprints; to the ophthalmologist they are simply vicious. It is not the price we quarrel with, but the excessive demand upon the accommodation and convergence required in reading them. The paper in these reprints is of a poor quality, too, transparent and yielding, so that the print shows through from the opposite side; while frequently it is embossed, and, owing to its porous quality,

the strokes which compose the letters are not clearly defined, but shade off with a blurred, irregular edge. The ink is usually pale or of a poor quality. The paper is apt to have a yellow tinge. At least, it is not of the dead white that is most desirable. Another grievous fault is the crowding of the letters and the closeness of the lines so as to save space. These qualities all make for cheapness, but violate the hygiene of vision."

As to proper illumination he gives the following directions: —

"The light should come from the rear and over the left shoulder. To secure this amount of daylight, the window area will require to be at least one fifth the floor area; but if the room be oblong, with the window in the end, it is evident that greater window space will be required, as the illumination diminishes as the square of the distance. If artificial illumination is used, the incandescent electric light, with highly ground glass globes, is by all odds the best. There should be at least a candle and a half to each cubic meter. The light in all instances should be well diffused. Working by direct rays should not be permitted. The tremendous absorption of diffused light by the dark woodwork and blue wall-papers and broad cornices of dark blue or brown or chocolate color, by yellow-tinted ceilings and gray-tinted walls, especially when these become soiled with smoke and dust and age and have irregular surfaces, can hardly be overestimated. They absorb immense quantities of the diffused light, and nullify the preceding calculations. Of course, we are considering workrooms, not parlors, reception-rooms, or bed-rooms. In such rooms these colors are soothing and restful to the eye. But in offices, workrooms, and schoolrooms the ceiling, wall, and woodwork should be light. To appreciate rightly the amount of light these colors will absorb, glance at the following list, showing the proportion of light reflected from the various substances as compared with that which falls upon their surfaces: Yellow wall-paper, 40 per cent.; blue paper, 25 per cent.; dark-brown paper, 13 per cent.; dark chocolate paper, .04 per cent.; white blotting-paper, 82 per cent.; white cartridge paper, 80 per cent.; white tracing cloth, 35 per cent.; white tracing paper, 32 per cent.; ordinary foolscap, 70 per cent.; newspaper, 50 to 70 per cent.; dark-brown paper, 13 per cent.; clean planed deal, 40 to 50 per cent.; dirty planed deal, 20 per cent.; soiled yellow paneled wall, 20 per cent."

The Cure of Laziness.

That indolence is not an isolated phenomenon, but a weakness prone to accompany other symptoms for which one consults a doctor, is argued by a prominent French physician, Dr. Maurice de Fleury, in the *Fortnightly Review*. The author undertakes to show that a person may be cured of indolence by observing certain hygienic, corporal, and psychological exercises, provided, however, that he feels the remorse of indolence. There are a great many indolent persons who are happy only in remaining so. Of course there is no cure for them, for they do not wish to be cured. But those who feel tormented by their inability to work on account of weakness of will, and are haunted by the cruel fear of slipping aside, can be saved.

Dr. Fleury maintains that indolence is nearly always due to bad cerebral habits. The majority of indolents are not necessarily lazy; the will of many of them is subjected to oscillations quite comparable with those of the mercury in a manometer; especially is this true of the indolents in the liberal professions. From time to time they put their shoulder to the wheel,

and make a short effort. This is the point at which a cure can be effected. The aim should be to convert the sudden fits of industry into regular, moderated work without fatigue.

In prescribing a treatment for cases of indolence, Dr. Fleury considers it important, among other things, "to impose an alimentary regimen, in order to suppress the sluggishness and congestion of the stomach, somnolency after food — those alternatives of exaltation and depression of the brain, produced by difficult digestion. People with a weak will very often have a tardy digestion; from another point of view, our mind is very poor, and hazy when we rise from table with flushed face and short breath, in spite of the loosened waistband, while a burning sensation, the 'hot coppers,' as it is called, rises and falls within our chest."

Ether Tippling.

The prevalence and the dangers of drinking ether are discussed in the *Scientific American*. The vice prevails among the peasantry in north and northwestern Ireland, and exists to some degree among the higher as well as the lower classes of England. Recently a medical officer of health in Prussia drew attention to the fact that ether tippling is excessively prevalent there, and is constantly increasing. It is added that the vice is an importation from Russia, it being in some districts of the Muscovite empire "perniciously prevalent." "Mere children," it is declared, "often come to school exhibiting signs of having imbibed ether before leaving home; mothers give it to their offspring to relieve abdominal pain; and on market days the odor of the drug is perceptible everywhere in the respiratory exhalations of the peasantry of both sexes, and when a vehicle occupied by them is encountered on the highway, a cloud of ether seems to float along."

Says the *Scientific American*: "That ether as a beverage and intoxicant is much more pernicious than alcohol, may be imagined; it is also much more seductive in its influence, once the individual is habituated thereto. The injuries accruing to the habit are more rapidly induced, and generally further reaching than those derived from beverages of a purely spirituous nature; chronic catarrhs that are absolutely irremediable, fatty degeneration of the heart, calcification of the great blood-vessels, 'hobnail' liver, — a cancerous condition, — softening of the brain and other cerebral troubles leading to great mental debility and even to complete idiocy, are the common sequels claimed to obtain to this vice." Our contemporary also mentions "the startling, increased, and general consumption of substitutes for alcoholic beverages," as well as the increase in the consumption of spirits proper, saying that in Great Britain the consumption of spirits has increased far beyond any ratio of increase in population; that more public houses are in existence; and that cologne drinking, chloral and cocaine taking, ether tippling, and the consumption of narcotic drugs generally, are in common vogue and daily, almost hourly, assuming enlarged proportions.

A Remedy for Ingrowing Nails.

A practical method of curing ingrowing nails is suggested as follows: With a flat probe or a match slip a bit of cotton between the edge of the nail and the inflamed flesh. Apply a strip of cotton along the outer margin of the ulcerated area. Powder the sore place between with nitrate of lead. Cover the whole with cotton and bandage the toe. Repeat the dressing daily until the edge of the nail is visible. Then carefully lift the edge of the nail away from the flesh, and put a piece of cotton under it

EDITORIAL.

A Test of Endurance.

The *British Medical Journal*, a leading medical authority of the world, publishes the following interesting item from its Berlin correspondent: —

"The Berlin vegetarians have a fine new feather in their caps. In a walking match of fifteen German miles (about seventy English miles) all the six vegetarians who started, passed the goal in perfect condition, showing no trace of excessive fatigue; while of eleven non-vegetarians, only one was able to hold out to the end, and he arrived long after the others, and very weary. The vegetarian victor did the distance — comfortably from his account — in fourteen hours and a quarter. He was sent for next day by the medical department of the Prussian War Ministry and interrogated as to his training, diet, etc."

It is to be hoped that the information given by the vegetarian pedestrian to the German War Department may lead them to supply their soldiers with something better than the salt pork and other disease-producing stuff furnished by the United States government to its soldiers during the late war. The lack of food adapted to the season and the climate must be held responsible, to a large extent at least, for the immense amount of sickness which has developed among the United States troops. The fact that the mortality has not been greater must be attributed to the fortunate termination of the war, thus giving our worn-out soldiers an opportunity to obtain supplies of more wholesome and seasonable food.

Pork is bad enough under any conditions, but pork and beans under a tropical sun has proved a death-dealing agency not much less powerful than Mauser bullets. The soldiers of ancient Rome, whose endurance has not been surpassed by that of any modern army, maintained splendid health on a diet consisting almost solely of barley; and when, under stress of circumstances, they were once compelled to subsist in part upon flesh, they made a bitter complaint against their commanding officers because of the wretched diet provided for them.

The world seems to be moving, just now, a little in the direction of rational diet reform. Such a feat as that performed by the vegetarian pedestrians referred to ought to be an eye-opener to a great multitude of people.

The Philosophy of Forgetfulness.

Forgetfulness is passive, not active. The nerve cells of the brain send out long feelers ending in tiny tufts by which they come into contact with other nerve cells. Thinking is an active process. When one tries to think, some of these little feelers begin to reach out and touch the filaments of other feelers. In the act of remembering there is an active process by which the filaments feel about until they touch the thing that is wanted. It is the same as when you run your fingers up and down the key-board of the piano until you strike the familiar chord which brings the tune back.

Forgetfulness is simply the lack of ability to do this. It may be caused by different things,— for instance, by the use of whisky. All irritating poisons have the effect of shortening the feelers. They exercise a paralyzing influence. Fatigue also causes an accumulation of poisons in the brain so that when a man is very tired he can not remember well, — the filaments of the nerve cells become paralyzed by the poison, and can not reach out to find the pictures or impressions necessary to memory. This is the philosophy of forgetfulness. That man can remember best whose blood is the cleanest and purest, who lives upon the best diet, who burns up the poisons in his system by fresh air and exercise, who takes natural and adequate sleep, so that the pores of his body are cleaned out, the cobwebs of his brain brushed down, and the dust and other débris swept away.

Am I My Brother's Keeper?

It is astonishing how little people concern themselves to take even the commonest precautions for the protection of their fellows against contagion of the dangers of which they are necessarily ignorant, and from which a little care would save them. The Secretary of the State Board of Health of Michigan has been calling the attention of the public to the spread of consumption caused by the non-enforcement of law. He gives the following letter from a prominent physician in the State, as illustrative of the almost criminal carelessness of the public as well as of some physicians:—

"Is there no way by which physicians are compelled to report to the health officers contagious diseases occurring in their practise? I know to my certain knowledge of a young lady, at present a victim of pulmonary phthisis, who contracted the same by her parents' moving into a house in which a young lady had, six months before, died of consumption. The girl occupied the same room as the deceased, which had not been disinfected or even repapered. The girl was in a debilitated condition, and, as the result, she now has tuberculosis. This is a case about which there is, in my mind, not a vestige of doubt."

Such cases are numerous. We have in mind a house in which six successive individuals, one after the other, fell victims to this dreadful malady. A thorough disinfection at the start might have saved five valuable lives.

Nothing Like Habit.

A certain man is said to have fainted on reaching the outskirts of the city of Chicago where some fresh air fell upon him. He was only restored by a smell of decay which reached his nostrils. When a person has become accustomed to air infested with germs and microbes, he develops a kind of resistance to them so that he can live in illy ventilated rooms under circumstances which would kill a South American monkey or a North American Indian in six months. It has been observed that people accustomed to living in a town infected with typhoid fever are likely to escape the disease, while a stranger soon comes down with it. Nature to a certain extent accommodates the system to microbes as well as to poisons. A man who is in the habit of smoking cigars may smoke enough in a day to kill a man who had never smoked. A man who is used to drinking whisky will easily drink enough to kill one not used to it. Nevertheless, all these poisons received from without or generated within, steadily undermine the system, and some day there will be a fearful reckoning, for nature is a strict accountant; and though a temporary settlement may be made by a mortgage on the future in shape of a tonic or a stimulant, so-called, sooner or later there will be a foreclosure, and the debtor will be turned out of house and home

Intemperance Among Women.

The Registrar General's statistics show that in England, while the death-rate among males has been increased fifty per cent. by intemperance, it has gone up 116 per cent. in the case of women.

That drunkenness is increasing among the women of our own country no one can doubt. It is not in the great middle class that we find it most prevalent, but in the so-called "upper circles" and among the poor and wretched. Dr. Lawson Tait, an eminent English surgeon and specialist, says that a woman after a certain point is always a secret drunkard. She does not openly sit at the table and get the worse for what she is drinking, as men do, but she is solitary and cunning, and hides the details of her vice with indescribable skill. Dr. Tait thinks that misery, either mental or physical, is the cause of this habit in women, and not its result. He maintains the opinion that intemperance is the result of disease or mental suffering, usually the former, and that in the majority of cases it may be cured by proper treatment.

It must be conceded, however, that intemperance is a vice as well as a disease, a moral or mental perversion as well as a physical

infirmity. The whole man is sick, soul as well as body, and no method can succeed in effecting a cure which does not recognize this fact.

Domestic Science a "Fad."

There has been considerable agitation in Chicago recently over the so-called "fads" taught in the public schools. A member of the Board of Education began a much advertised attack on these "fads," by proposing to strike domestic science from the curriculum. It is comfortable, however, to note that only one other member of the board held the same medieval opinion. It was the general sentiment that if the boys were to be taught manual training, the girls should be instructed in sewing and cooking. It would certainly seem to be quite as important that the girls should learn how to prepare the food that is to build up bodies, as that boys should know how to make the table upon which this food merely stands for an hour.

Boiled Germs Unwholesome.

It is better that the germs should be dead than alive. But so far as possible one should choose foods and drinks that do not contain them. Especial care should be taken of drinking water. Cold water is not necessarily pure. Indeed, it is even more likely than warm water to absorb and retain poisonous gases and particles to which it has been exposed. Hence water that has stood uncovered all night is absolutely unfit for use. The water from faucets over sinks and basins should always be allowed to run some time before using in the morning. Even sterilized butter and cream are not the best foods, for the germs are only killed and not removed by the boiling process. In the case of boiled water, the germs, though dead today, are reproduced to-morrow, at least some of them, for new germs entering from the air soon multiply by feeding upon the dead germs contained in the boiled water. Boiled water soon becomes tainted unless hermetically sealed like canned fruit.

Ice-Cream to Blame.

Cases of ice-cream poisoning are becoming more and more common. An Ohio paper recently contained the following: "Great excitement rages over the threatened epidemic of typhoid fever. Twenty-two persons are sick, and with many of this number the attack is malignant. New cases are reported. It is believed that the epidemic had its inception in a church sociable two weeks ago, when seventy-five persons partook of ice-cream and lemonade. The twenty-two persons now ill with typhoid were of this number."

In this instance the ice-cream was not bought of an "itinerant vendor" who had kept it overnight in infected quarters. It was doubtless made of supposedly "good" cream from a reputable source. The greatest trouble with any ice-cream is that you can not tell just to what extent it is going to injure you. If you have typhoid fever in consequence of eating it, you realize that you have been poisoned. But if you have a bad tongue and breath, and a sick-headache the next day after indulging in the frozen delicacy, you consider it a trifling matter, and very likely never think of attributing it to the ice-cream. But the best ice-cream is unfit to be taken into even a perfectly healthy stomach. The combination of sugar and cream is exceedingly unwholesome, while the extreme cold paralyzes the digestive organs and in time works permanent mischief. Although you might eat ice-cream twice a week for twenty years without ever forming intimate associations with the typhoid bacillus, yet the poisons generated in your system during that time by such an unnatural and injurious food would certainly have done you as much harm as a run of fever.

TEA AND RHEUMATISM.

FIFTY years ago the great physiological chemist, Lehmann, pointed out, in his magnificent treatise upon physiological chemistry, the fact that the chemical composition of caffein, the active principle of tea and coffee, is very closely related to that of kreatin. He also, at the same time, proved by unanswerable arguments that kreatin is an excretory product, and in no sense a food, as has been claimed by certain of his contemporaries, and which, we are sorry to say, is still ignorantly maintained by some who have not made themselves as thoroughly familiar with the history of physiological chemistry as those who set themselves up as instructors in dietetics should do. The significance of the affinity between kreatin and caffein was emphasized by Lehmann in the following remarks respecting the poisoning properties of the active principle of tea and coffee:—

"A substance of which a quantity of from two to ten grains will produce the most violent excitement of the vascular and nervous systems — palpitation of the heart, extraordinary frequency, irregularity, and often intermission of the pulse, oppression of the chest, pains in the head, confusion of the senses, singing in the ears, scintillations before the eyes, sleeplessness, erections, and delirium — can scarcely be reckoned among articles of nutrition, even by the homeopathist, and certainly not by physiologists, when they learn how quickly caffein becomes decomposed in the organism, and gives rise to an increased secretion of urea.

"The above-named results were yielded by experiments instituted on myself and several of my pupils with pure caffein. Five persons (one of whom was Professor Buchheim, now at Dorpat), after taking from five to ten grains of this substance, were unfit for any business during the next day, while in an experiment which I formerly made on myself, ten grains scarcely produced any perceptible action. In all the cases there was found to be augmentation of the total amount of urea excreted in twenty-four hours."

Haig, who has devoted ten years or more to the close study of uric acid and the effect of all classes of food substances upon the formation and excretion of uric acid, points out, in his great work upon this subject, that thein, or caffein, when introduced into the system, produces precisely the same effect as does uric acid itself. Indeed, he insists that "it makes absolutely no difference whether we swallow a grain of uric acid, xanthin, hypoxanthin, thein, caffein, or theobromin; all alike produce, as a primary effect, clearance of uric acid from the blood, with free capillaries and general stimulation of metabolism and nutrition; all alike have also a secondary action or rebound, when the uric acid again passes into solution in the blood, with obstructed capillaries and general depression of nutrition and metabolism."

Haig observed also that guanin, kreatin, and other excretory substances, as well as various vegetable alkaloids and ptomains, have precisely the same effect as do uric acid and caffein. The effect of each of these substances, as Haig has shown, is to increase the acidity of the blood, thereby decreasing the absorption of uric acid from the tissues. Upon this point, Haig says:—

"The primary stimulant action of uric acid and its congeners being thus in evidence, and it being also clearly proved that this is due to their interfering for a time with the solubility of uric acid in the blood, we are in a position to explain completely the primary stimulating effects of tea, coffee, cocoa, guarana, beef tea, meat extracts, soups and thyroid extract, also the use of such things as pigeon's dung in ancient prescriptions, and a draught of child's urine as a stimulant by some nations at the present day."

It would hardly be maintained that tea is the only cause of rheumatism. However, the established relation of uric acid to rheumatism makes it clear that whatever increases the amount of uric acid in the tissues, either by diminishing its elimination from the body or by adding to the store of uric acid already contained in the body, must be at least a predisposing cause of this disease. The thein of tea, as Haig has shown, does both: it diminishes the elimination of

uric acid by increasing the acidity of the blood, and at the same time adds to the body a substance which is practically identical with the excretory substances of which uric acid is the representative.

Haig has shown a close relationship of migraine, Bright's disease, neurasthenia, melancholia, and other maladies, to rheumatism and gout. An experiment made by Haig with citrate of caffein showed that ten grains, given in three doses, raised the amount of uric acid excreted in twenty-four hours from thirty grains to seventy grains.

The habitual use of tea as a means of relieving headache is without doubt an efficient cause of rheumatism in numerous ways. The writer has met many persons who could not forego the morning cup of tea or coffee without suffering severely from headache and depression during the day. Haig has shown that a dose of uric acid will cure a headache, by driving the uric acid out of the blood. The day following, however, the reverse condition exists. The amount of uric acid found in the blood is increased, and a new dose must be given to protect the nervous system from the result of the contact of this nerve poison. The thein, or caffein, of tea has precisely the same effect as uric acid, and hence has come to be a favorite domestic remedy for headache. When used habitually, however, as will readily appear, the effect must be to cause a storing up in the body of uric acid and urates, thus laying the foundation for chronic rheumatism and the various allied conditions which have their foundation in the so-called uric acid diathesis, or lithemia.

This question, among others of the interesting problems which Haig has opened up by his elaborate and painstaking researches, is worthy of careful study and consideration.

INFANTILE SCURVY.

THE July number of the *Archives of Pediatrics* contains important information concerning the causes and treatment of infantile scurvy. This information is the result of the efforts of a committee appointed by the American Pediatric Society to obtain statistics concerning this malady, especially its causes.

The report of the committee embodies the work of nearly a year, and contains the report of three hundred and seventy-nine cases seen by one hundred and thirty-eight observers. The report shows that the majority of the cases were between the ages of seven and fourteen months. The youngest case reported was a child four weeks old, and the oldest, nine years.

The report shows that the most important factor in the causation of this disorder is diet. In the investigation the question was asked of each correspondent, whether in his opinion the disease depended on the nature of the food used. In two hundred and seventy-five cases this question was answered in the affirmative. In two hundred and fourteen of these cases, or sixty per cent., proprietary foods were used.

From a study of these facts, it will be learned that infantile scurvy is a disease in which the diet plays a very important part, and that in the larger number of cases proprietary foods are used. The objection raised against proprietary foods is that their chief element is usually starch, a substance which the digestive organs of the infant are unprepared to deal with. What the infant needs is an abundant supply of albumen, sugar, and salts, all of which are supplied in their natural state in the mother's milk. In order to produce a food which will meet the requirements of the infant, we must look for a whole food, that is, one in which we find all the original elements in as nearly as possible their natural condition.

It is largely for this reason that cow's milk diluted with water, or with very thin well-boiled barley or oatmeal gruel, is usually preferable to the great majority of the proprietary infant foods which are almost universally advertised in both the medical jour-

nals and the newspapers. Even the old-fashioned flour ball was, by its thorough cooking, better prepared for the use of an infant a few months old than the average infant food. No greater imposition has ever been perpetrated upon the American public than that which is now so extensively practised in the large number of proprietary infant foods advertised in papers and magazines of all sorts, and sold in drug-stores throughout the country.

Unfortunately, there is a large class of children who can not use cow's milk. The hard curds formed by the casein of cow's milk remain so long in the feeble stomach of the child that they undergo decomposition, thus forming poisons of an extremely irritating and disturbing character, and giving rise to intestinal and stomach disorders which sometimes lay the foundation of life-long dyspepsia. In these cases, especially in those that have not yet attained the age at which cereal foods can be digested,— that is, in children in whom the first teeth have not yet appeared,— it is necessary to supply some food that is adapted to the digestive organs of the child and is capable of being easily converted into blood and tissue.

Some efforts have been made to supply such a food. Unfortunately, these efforts have been for the most part unsuccessful. Those brands of infant food which can be thoroughly and unqualifiedly recommended can be counted upon the fingers of one hand. We have not space here to consider the merits and demerits of all the different kinds of infant foods on the market at the present time, and it is by no means the purpose of this article to attack any particular manufacture or any particular brand of infant food. We only wish to call attention to the matter in such a way as to cause parents to make a careful investigation of this subject before trusting the health and perhaps the lives of their little ones to a dietary which may be so lacking in useful nutritive elements as to constitute veritable starvation, resulting ultimately in disease, which, if not incurable, can only be eradicated by long and patient effort and the employment of expensive measures.

For more than twenty years the writer has been engaged in the study of this question, and has taken pains to investigate a great number of infant foods. Experiments with new combinations and new methods have also been made. The result of this study and experimentation has been to lead us to reject nearly all the so-called infant foods now offered on the market. A few only have in our hands stood the test of chemical investigation and clinical application. Among the few foods suited for the use of infants we will mention those that we have found the most serviceable. A number of these are not especially designated as infant foods, and yet have been shown by experience to be admirably adapted to the nourishment of infants, under appropriate conditions and circumstances.

Granola.— This is a farinaceous preparation which represents the whole wheat, lacking only the outer layers of cellulose, or wood, which covers the kernel,— that is, the coarsest bran. It represents the total nutritive elements of wheat, and has been subjected to a process of predigestion by heat, which brings it into a state readily soluble by the saliva and pancreatic juice. Granola, in the form of granola gruel or mush, is suited to the use of infants that have begun to cut their teeth. While not a universal food for infants, it can scarcely be excelled for those who have cut their first teeth.

Granola consists of a combination of the most easily digestible grains, mingled in such proportion as to provide the proper amount of each nutritive element and in the most digestible form. By the process to which it is subjected in manufacture, the starch is largely converted into achroödextrin, which is next to the last of the four stages through which raw starch passes in complete conversion into sugar. When the saliva or the pancreatic juice comes in contact with this partially converted starch, the process is completed almost instantly, so that the digestive organs are taxed to the smallest degree possible.

Granola may be eaten with milk, but it is better to take it dry or with a little fruit-juice, as in most cases in which artificial

feeding is required, there is considerable disturbance of digestion, rendering the digestion of milk of such character that it is not readily tolerated, giving rise, when taken, to foul tongue and breath, constipation, and other bad conditions.

The Battle Creek Sanitarium Infant Food is another article which can be safely trusted as a food, especially for infants who have begun to cut their teeth. This article differs from granola in several important particulars. It is prepared exclusively from wheat and oatmeal, instead of from a mixture of cereals, but has been enriched by the addition of a considerable portion of pure gluten, thus giving it high value as an albuminous food. There is no food element more easily digested than cooked gluten. When introduced into the stomach, it undergoes prompt and complete digestion. A considerable amount of easily digested albumen is supplied by the oatmeal, and also a large proportion of a highly digestible fat.

This article is a most palatable, nourishing, and assimilable food, containing an abundance of salts, and is valuable in cases of rickets and various exhausting diseases. It is especially serviceable during the hot months of the year, when milk is so likely to cause trouble because of the mischief-making germs which it is almost certain to contain. This food is very thoroughly cooked, and requires only to be mixed with hot water to be prepared for use. It may be employed either with or without the addition of the cream of cow's milk. If milk or cream is used with it, care should be taken to see that these are thoroughly sterilized.

Malted Nuts. — Another food which we have found admirably adapted to the dietetic treatment of emaciated infants and those who are unable to make use of cow's milk, is malted nuts. This article is also especially serviceable in cases in which the child has not yet reached an age at which the digestive organs are capable of transforming starch into sugar. In malted nuts the elements usually found in farinaceous foods are present, but in a state of complete digestion, ready to be absorbed promptly. In nuts we have the necessary supply of fat which is one of the most essential of all foods, especially for young infants, and which, though usually present to some extent in all dietaries, is very commonly present in insufficient quantity. Malted nuts supplies an adequate proportion of fat in the form of a delicate and easily digested nut oil, which is, moreover, present in the state of natural emulsion, having never been separated from the combination in which nature presents it in choice, edible nuts. Malted nuts also contains an abundant supply of nitrogenous, or proteid, elements. It is a complete food, and hence may be used to the exclusion of other foods. It is especially adapted to the use of bottle-fed infants, but may be employed with equal propriety and success by invalids of all classes.

Malted nuts is not a mixture of food elements, but is a preparation of natural food products, some of which have been predigested, while all have been prepared for prompt appropriation by the system. Malted nuts may be used either by itself, requiring no other addition than the right proportion of water, or it may be used in combination with milk and with other foods. It increases the digestibility of milk, and aids in the digestion of farinaceous, or starchy, foods.

A very important fact was brought out in the report referred to, which has a significant bearing upon the treatment of these cases. It was stated that in no case did recovery occur as the result of drug treatment only. The dietetic treatment applied resulted in a cure of more than two hundred and fifty cases, or more than two thirds of the entire number.

This question is one of an exceedingly interesting and practical character. The facts to which we have referred ought to be brought to the attention of every mother who has the responsibility of caring for small children.

ANSWERS TO CORRESPONDENTS.

Rheumatic Gout.— C. M. M., New York: "1. Should one troubled with rheumatic gout use nut foods? 2. What plan for meals would you suggest for a person whose business hours almost necessitate three meals a day?"

Ans.— 1. Yes.

2. We recommend such a person to arrange his business hours so that he can take his meals at proper times. If he can not do that, perhaps the next best thing would be to take a light lunch for breakfast, a substantial dinner at noon, and a little fruit at night.

Rheumatism.— Mrs. A. B., sixty-four years old, wishes to know the cause of prickling, smarting sensations in the lower limbs, with rheumatism and sleeplessness.

Ans.— Probably the uric acid diathesis. The patient should have a course of treatment at a sanitarium, as the difficulty is likely to become worse.

Scald Head.— G. W., Oklahoma, asks for a prescription for sore nose and eye, resulting from scald head in childhood. Would a Perfection vaporizer be of use?

Ans.— We should recommend the Magic Pocket Vaporizer, to be used as nearly continuously as possible.

Diarrhea.— C. G. asks what diet is best for one troubled with diarrhea.

Ans.— An exclusively fruit dietary consisting of peaches or grapes would doubtless be beneficial, if pursued for a few days. In the majority of cases a cure can be readily effected by this means. A buttermilk diet is also sometimes of service. Gluten gruel, the Battle Creek Sanitarium Infant Food, granola, fruit-juices, and boiled rice, with fruit-juice are also wholesome foods.

Ulcerated Throat.— E. G. S., Mississippi: "1. Please give a remedy for ulcerated throat in a girl of sixteen. The tonsils have been removed, but without relief. 2. What causes a tough, yellow phlegm to collect in the roof of the mouth?"

Ans.— 1. The Pocket Vaporizer should be used. It is very likely that applications by a specialist are also required. Try touching the ulcerated parts with tincture of iodine by means of a cotton applicator. Wind the end of a lead pencil with cotton, apply a couple of drops of iodine, and touch this to the ulcers.

2. Probably post-nasal catarrh. Use a Pocket Vaporizer for both throat and nose.

Cook Book — Cocoa.— Mrs. H. A. C. H., New Jersey: "1. Is there any cook book for a strictly vegetarian diet,— without milk, butter, and cheese? 2. Do you consider cocoa made from the unadulterated cracked cocoa bean, injurious?"

Ans.— 1. Yes, "Every-Day Dishes," by Mrs. E. E. Kellogg, published by the Modern Medicine Publishing Company, Battle Creek, Mich.

2. Yes, the cocoa bean contains theobromin, a poisonous substance similar to that contained in tea and coffee, and productive of the same injurious effects. The effect upon the system of these poisons is practically the same as that of uric acid, one of the excrementitious elements eliminated through the kidneys.

Distilled Drinking Water.— Mrs. W. G. Mac B., Ohio, asks: "1. Is distilled water the best drink that can be prepared at home? 2. If not, how can pure drinking water be prepared? 3. What is the best distiller?"

Ans.— 1. Yes.

2. Ordinary well water is generally entirely wholesome, if boiled for fifteen or twenty minutes. Distilled water is of course better, especially if the water is hard.

3. There are several excellent stills. The Sanitary Supply Co., of Battle Creek, Mich., is prepared to furnish a very excellent water still for $15.

Nut Butter — Root Beer — Cider — Drinking at Meals.— G. W. B., Michigan, asks: "1. Does nut butter tend to produce biliousness? 2. Does root beer made at home contain alcohol? 3. If so, about how much on an average compared with weak lager-beer? 4. If cider or grape-juice, fresh from the press, be boiled, say, fifteen minutes, and immediately bottled and sealed, will it keep without fermentation, and be perfectly wholesome when opened? 5. Do you advise a hot drink, as caramel-cereal or malted nuts, before or with meals?"

Ans.— 1. Nut butter made from roasted nuts, if eaten in considerable quantity, and especially in cases of hypopepsia, might give rise to biliousness. In the improved form of nut butter, known as nuttolene, the nuts are presented in a better state, and this difficulty is obviated.

2. Yes.

3. About one-half to three or four per cent. according to the length of time the fermentation continues. The amount of alcohol is about the same as that in lager-beer, after the fermentation is continued for a few days.

4. Yes, if sufficient care is taken to have the bottles sterilized and also the corks, and to seal

tightly. It is better to boil the juice after putting into the bottles.

5. No. It is better not to drink at meals. If liquid is needed, half a glass of water may be taken half an hour before meals, or two or three hours after. Malted nuts should be taken not as a drink but as a food. It is perhaps the most harmless of all liquid foods, for the reason that it does not require any action of the saliva for its complete digestion, but it should not be employed for the purpose of rinsing down other food.

Thick Saliva.— H. W., Illinois, wishes to know what causes the saliva from the glands at the base of the tongue to become thick and copious. He can eat the dryest food easily.

Ans.— The use of dry food promotes activity of the salivary glands. Dryness is a quality of food which stimulates the glands to the highest degree.

Chronic Diarrhea.— Mrs. A. A., South Dakota, writes that since she had malarial fever in Florida two years ago, she has been troubled with looseness of the bowels, bloating, and cramps. All food causes distress. She uses only the plainest food, and that wholly of grains. She asks if the climate of Boulder, Colo., would benefit her.

Ans.— The case is not one likely to be benefited by climate. A change of diet and proper treatment are the necessary indications. We should recommend a dry diet, consisting of well-toasted granose cakes (split and toasted until slightly browned throughout). Peaches, grapes, and baked apples may also be taken with advantage. At night apply fomentations to the stomach for fifteen minutes, and apply a cold moist towel to be worn around the abdomen during the night. The towel should be wrung as dry as possible out of cold water. In the morning bathe the parts with cold water. It is probable that some of the abdominal organs are prolapsed. These may be kept in place by an abdominal supporter. An enema should be employed daily. It may be necessary to employ tannin as an astringent enema, in the proportion of a dram to the quart of water. The bowels should be thoroughly emptied by a large enema daily. Still other measures may be necessary. The patient would do well to visit a good sanitarium for a few weeks.

Stomach Trouble.— H. S., Pennsylvania, writes of his wife, who has been confined to the bed for two years with pain in the back and heart: "What diet would be best for her? She is using granola."

Ans.— A diet of granose, granola, malted nuts, and fresh ripe fruits will probably benefit the patient. This case is too serious to be managed by home treatment. It should be placed under the care of an experienced physician in a good sanitarium.

Arrested Growth.— A reader in New York City, sixteen years of age, wishes to know what can be done to promote growth. He has not grown more than two inches in four years.

Ans.— Exercise, proper diet, and the morning cool bath are the most effective means for promoting growth. Height depends first of all upon the bones. As the bones individually increase in length, the height increases. The bones are made to grow by an increased supply of blood, which may be brought to them through the medium of exercise. A diet consisting of fruits, grains, and nuts is in the highest degree conducive to sound digestion and to healthy development of the body.

Stomach Trouble.— D. F., South Dakota, asks: "1. Can a person's stomach be in a bad condition while his tongue is clean? 2. Can a person have dilated or prolapsed stomach, and yet suffer no discomfort in that region? 3. What treatment would you recommend for such a case?"

Ans.— 1. Yes; he may have hyperpepsia, or even ulcer of the stomach.

2. Yes. The most troublous symptoms of prolapse of the stomach are the reflex symptoms which are experienced in the head, spine, and other portions of the body.

3. Prolapse of the stomach and dilatation of the stomach are very difficult to cure. Until very recently these disorders have been considered incurable. But by the combined employment of massage, electricity, exercise, and proper clothing, a large portion of these cases are curable. In many cases it is necessary for the patient to wear for a long time the abdominal supporter or the Natural Body Trainer, which will hold the prolapsed organs in position, while the muscles are trained to hold them in place.

Gastric Fever.— F. A. W., Washington, D. C., after having had a severe attack of gastric fever, finds these symptoms present in the system: a tired feeling, despondency, a tingling sensation in the head, resembling that of the foot when "asleep," great nervousness and general wretchedness. Is this the usual result of gastric fever?

Ans.— The symptoms indicate a serious disturbance of the abdominal sympathetic centers. This condition might be the result of a severe fever. Whether or not this is the cause in the present case we could not say without a more

thorough investigation. The case is one exactly adapted to sanitarium treatment. The patient needs a few weeks at a sanitarium to afford opportunity for careful investigation of the morbid conditions present, and training in the necessary regimen and treatment to secure a material and permanent improvement in health.

Defective Assimilation.— L. W. F., Massachusetts, finding herself in a "generally wretched condition" in consequence of poor assimilation, desires advice, and asks the following questions: "1. What fruits would you recommend for a person who hitherto has been unable to eat either sour or sweet fruits? Fruits seem to cause more trouble in the stomach and head than a meat diet. 2. Why does meat cause less fermentation and general disturbance than fruits, vegetables, and grains, taken separately or in the best combinations? 3. Is honey laxative? 4. Is it fattening? 5. Would you advise its use in the place of cane-sugar and butter, for one who can not digest either of these articles? 6. Where can banana and fig bromose be obtained? 7. If a laxative must be continued, what one would you recommend as harmless and effective for a case of obstinate, long-standing constipation?"

Ans.— 1. Chronic gastritis is probably present in this case. The acids of fruits sometimes disagree with the stomach in chronic gastritis in a peculiar, almost an unaccountable way. Strawberries, peaches, and grapes generally agree better in such cases than most other fruits. Baked sweet apples may also generally be recommended, also fresh figs and stewed raisins. A flesh diet occasions less discomfort than most other articles of food, but is nevertheless injurious.

2. Because it contains no starch. The germs which produce fermentation act upon starch and sugar, which are abundant in grains and fruits, but are absent in meat.

3. Yes.

4. Yes, to a high degree, when it does not produce indigestion.

5. Yes, if it produces no disturbance.

6. Of the Sanitas Nut Food Co., Battle Creek, Mich.

7. There is no medicinal laxative which is absolutely free from injurious effects when continued indefinitely. Granose and nut products are laxative foods, and may be used indefinitely without injury.

Rupture.— H. B., Illinois, asks: "1. Is the treatment of rupture by injection as sure or permanent as a surgical operation? 2. Is there danger of bad effects from such injections? 3. Is rupture treated by injections at the Battle Creek Sanitarium?"

Ans.— 1. No. This method seldom succeeds. The writer has had occasion to operate many times upon cases in which the injection method had been previously tried without other result than to complicate the case and make a cure by the surgical method much more difficult. The most approved surgical methods for the radical cure of hernia are ever safe and reliable. They rarely or never fail to effect a cure when in the hands of an expert and experienced operator.

2. Yes.

3. This method was employed for a time by the surgeons of the Battle Creek Sanitarium, but when its unreliable character was discovered, it was abandoned for other means.

Hydrocele.— W. O. B., Illinois, asks what is the best diet and treatment for a severe case of hydrocele in a boy four years old. He has been sick with lung trouble for four weeks.

Ans.— An operation is required. The operation is simple, and not dangerous. It can be performed by any good surgeon.

Bronchitis—Rye Bread—Fruit—Electricity—Massage—Pure Foods.— C. A., Rhode Island, sends the following queries: "1. What diet would you recommend for a sufferer from chronic bronchitis and dyspepsia? 2. Is rye bread healthful? 3. Are apples and dates easy of digestion? 4. Is it essential to health that one should drink a great deal of water? 5. Is electricity beneficial? 6. Does massage increase flesh? 7. Are the foods mentioned in GOOD HEALTH absolutely pure — without disease germs? 8. Can these foods be sent by mail?"

Ans.— 1. A diet consisting chiefly of granose, nuttolene, bromose, malted nuts, well-cooked rice, zwieback, and fresh fruit.

2. Yes, if well baked.

3. Ripe apples are very easy of digestion, especially when cooked. Green apples are highly indigestible. Dates are also somewhat difficult of digestion, for the reason that they are preserved in molasses or sugar. Almost all the dates to be obtained in this country are open to this objection.

4. The amount of water which one should take daily depends upon the quantity of fruit taken, the temperature of the air, the season of the year, and the amount of exercise taken. It is better to take an excess of water than too little. Probably the majority of people take too little water. A good plan is to take a glass of water on arising in the morning, and another on retiring at night. One or two glasses may also be taken during the forenoon, and a like quantity during the afternoon, in the intervals between meals.

5. Electricity may often be used advantageously in cases of pulmonary and intestinal disorders.

6. Yes, if properly employed. It may also be applied in such a manner as to reduce flesh.

7. Yes.

8. Yes, but the expense is rather great.

Stone in the Bladder — Kava-Kava.— Mrs. C. G. K., Kansas, is troubled with what the doctor calls stone in the bladder, the pain appearing in the left side over the kidney, and extending to the bladder. It lasts a few hours and then is over, the attacks occurring several weeks apart. The kidneys are more active just before an attack, and discharge some blood. 1. What treatment would you recommend? 2. Do you consider kava-kava good?

Ans.— 1. A good surgeon should be consulted. An operation may be needed.

2. There is no drug capable of curing stone in the bladder.

Creaking of the Joints.— A correspondent in Columbia asks: "1. What is the cause of creaking of the joints when the head is turned or the jaws opened wide? 2. What causes pain between the shoulders and at the lower part of the back? The lady is a dressmaker, and finds her back very painful on attempting to rise from a chair. 3. What is a good application for the hands after washing, to prevent stiffness and dryness?

Ans.— 1. The usual cause is slipping of the tendons connected with the joints.

2. Usually an irritable condition of the solar plexus.

3. Dip in cold water and rub with a very little vaseline, the smallest amount possible.

Constipation Following Dysentery.— H. N. C., Ohio, wishes advice as to treatment for indigestion and constipation, caused by a severe attack of dysentery nearly two years ago. Warm enemata are used daily.

Ans.— Adopt as staple articles of diet granose, malted nuts, nuttolene, and fresh fruits. These articles are all laxative, and afford an abundance of nutritive material of the most easily assimilable and wholesome character. The graduated enema should be employed, and a moist abdominal bandage. Other useful measures will be found described in our little work, "The Stomach," published by the Modern Medicine Co., Battle Creek, Mich.

Chronic Constipation.— Mrs. B. H., Kentucky, wants to know: "1. What diet is best for a long-standing case of constipation? 2. Where can the proper foods be obtained? 3. Can the Sanitarium Health Foods be obtained of Siegel, Cooper & Co., in Chicago? 4. Is Postum Cereal the thing to use?"

Ans.— 1. See answer to H. N. C., Ohio, in this number.

2. Battle Creek Sanitarium Health Food Co.

3. Yes.

4. With reference to this article, we can only say that it is a very poor substitute for a very poor thing.

Wrinkles.— A correspondent asks if the use of a "hot towel" after shaving will in time injure the texture of the skin, and cause wrinkles. He shaves six times a week.

Ans.— No, but it is well, to preserve the health of the skin, to follow the hot application by a short cold application.

Position in Sleep — Magnesia — Legumes — Nuts — Gas — Electric Belt.— Mrs. A. E. C., Texas, desires answers to the following questions: "1. Is it conducive to the health of an infant or child to sleep for hours lying on the stomach? Many seem to sleep better in that position. 2. Is magnesia a proper remedy for sour stomach? 3. If not, what is? 4. Do beans and peas combine readily with fruits in the dietary? 5. Can pecans or peanuts, ground in a nut mill, be eaten at the same meal with fruits? 6. What will prevent the formation of gas in the digestive tract, caused by eating peas and beans? 7. Is a common electric belt a benefit or a detriment to any one?"

Ans.— 1. There is no objection to sleeping in this position if it is found comfortable.

2. No.

3. If the acidity is due to germs, they should be removed by washing the stomach, or the employment of some antiseptic, such as charcoal tablets. If the acidity is due to excessive hydrochloric acid, it should be combated by proper diet and short hot applications over the stomach.

4. Yes, if properly cooked.

5. Yes.

6. The hulls or skins of the legumes should be removed by means of a colander. Peas, beans, and lentils are most easily digested in the form of a purée.

7. The majority of these contrivances are entirely inert.

Pain in the Back.— Mrs. L. S. B., Vermont, inquires: "1. Is it probable that severe pain in the back, about two inches to the left of the lower part of the spine, is caused by rheumatism, or may it be the effect of a strain received last haying season, in raking with a horse rake over rough ground? The patient is a man thirty-seven years old. The attacks occur every few days. 2. What treatment should be given? 3. Is it dangerous to neglect such a case?"

Ans.— 1. The pain might be due to either cause. It is probably neuralgic in character, due to chronic uric acid poisoning.

2. Large, very hot fomentations applied over the back will probably afford relief.

3. Yes. The disorder is at least likely to become chronic, and possibly incurable.

Roaring and Pain in the Head.— J. S., California, writes; "For a long time I have been troubled with roaring and gurgling sounds in my head, and at times pain in the head and back, with dizziness. I have consulted several doctors, but get no permanent relief. I take no exercise except a little walking, and am told my trouble comes from inactivity of the liver. The bowels are not regular, and at times I feel dull and sluggish. I would thank you very much to give me your views."

Ans.— The cause is doubtless chronic dyspepsia, and probably gastric neurasthenia. You ought to spend a few months in a well-ordered sanitarium for treatment and training. The case is not likely to be permanently bettered by such brief directions as can be given in these columns. A diet of nuts, fruits, and grains, an abundance of out-of-door exercise, with a cool morning bath every day, will doubtless prove helpful.

Catarrh.— D. B., California, states that he has been troubled with nasal catarrh for ten years, with soreness of the nasal passages and foul breath. The throat also seems to be somewhat affected. The writer has been a reader of GOOD HEALTH for three years, and is putting into practise all he learns from it. He desires suggestions as to treatment and diet. His diet now is mostly granose, zwieback, graham crackers, with plenty of fruit, and about three pints of milk a day.

Ans.— Discard milk, and use nuts instead. Take a cool bath every morning, fomentations over the region of the liver at night, followed by a moist abdominal bandage to be worn during the night.

Care of the Baby.— An anxious mother who has lost three children, desires advice in regard to her nine-months-old baby. Her children have all suffered from bowel trouble in hot weather, but she hopes to avert it this summer. The baby had a severe time with malnutrition and wasting disease of the bowels last season. The trouble seems to be hereditary. The father and mother live correctly, but the grandparents used tobacco, and had liver complaint and jaundice. The children all seem to do well as long as the mother nurses them. 1. What should be the baby's diet this summer? 2. Should the mother eat acid fruits? 3. How often should the child be fed?

Ans.— 1. We would recommend malted nuts and Sanitarium Infant Food.

2. There is no objection if they do not disagree.

3. Once in four or five hours, omitting one feeding during the night.

Feeding the Baby.— F. G. B., Illinois, asks: "At what age should a baby be fed food other than breast milk, when it is healthy and fat, and when plenty of milk is provided?"

Ans.— The child should begin to eat farinaceous food when it begins to cut its teeth. The appearance of the first teeth is an indication that the child is able to digest starch. Granose is the most suitable food for such a child. Bromose and malted nuts are also to be recommended.

Rough Spots on the Face — Canker Sores. — E. R. H., Ohio, writes: "For three or four years my son, aged fourteen, has been troubled with rough spots on his face, slightly inflamed at times, and sore to the touch. They are always worse in cold weather. 1. What is the cause and cure? 2. What is the cause of canker sores? and what will cure them?

Ans.— 1. The difficulty is probably acne; cause, indigestion. The stomach should be cured. The affected parts should be bathed in very hot water for five minutes three times a day. Two or three antiseptic charcoal tablets should be taken after each meal.

2. Indigestion. Wash the mouth with a saturated solution of boracic acid after each meal. If the sores do not heal, they should be touched with a forty-grain-to-the-ounce solution of nitrate of silver.

Wrinkles.— Mrs. E. B., Illinois, wishes to know: "1. Would you recommend having the flesh cut away to tighten the skin under the chin and on other parts of the face where it has become flabby? 2. What is the best preparation to use on a face that looks dry and wrinkled, especially under the eyes? The person is not yet forty-eight years old."

Ans.— 1. No.

2. Hot and cold bathing and massage

Substitute for Meat.— F. E. B., Massachusetts, asks: "If meat is excluded from the diet, what vegetable would you put in its place, so that the correct proportion of carbon and nitrogen may still be maintained?"

Ans.— Nuts and legumes.

LITERARY NOTICES.

The Investment of Influence, by the Rev. Newell Dwight Hillis, the noted divine of Central Church, Chicago, is a mine of beautiful and practical thoughts in regard to helpful living — living that shall aid in the uplifting of mankind as well as of ourselves. The book is made up of fourteen chapters, the title of each being the index thought of its contents. Among them are: "Influence, and the Atmosphere Man Carries;" "The Investment of Talent, and Its Return;" "Renown through Self-Renunciation;" "The Gentleness of True Gianthood;" "The Thunder of Silent Fidelity: a Study of the Influence of Little Things."

The title of the book gives one a fair idea of its contents, but it can convey nothing of its wealth of allusions, its aphorisms, its beautiful imagery. A few quotations will give a better idea of the book than can be gained from any description.

"Nothing is so easily wrecked as the soul. As mechanisms go up toward complexity, delicacy increases. The fragile vase is ruined by a single tap. A chance blow destroys the statue. A bit of sand ruins the delicate mechanism. But the soul is even more sensitive to injury. It is marred by a word or a look. Men are responsible for the ruin they work unthinkingly. To-day the engine drops a spark behind it. To-morrow that engine is a thousand miles away. Yet the spark left behind is now a column of fire mowing down the forest. And that devastating column belongs not to another, but to that engine that hath journeyed far. Thus the evil man does lives after him."

"Give thy body obedience, and it will return happiness and health. Give overdrafts and excesses and it will return sleepless nights and suffering days. Man's sins are seeds, his sufferings, harvests. Every action is embryonic, and according as it is right or wrong will ripen into sweet fruits of pleasure or poison fruits of pain."

"The throne of the universe is mercy, and not marble."

"What the man is determines largely what his intellect thinks about God. When the heart is narrow, harsh, and rigorous, its theology is despotic and cruel. When the heart grows kindly, sympathetic, and of autumnal richness, it emphasizes the sympathy and love of God. Each man paints his own picture of God. The heart lends the pigments. Souls full of sweetness and light fill the divine portrait with the lineaments of love."

(Three hundred pages, cloth, gilt top, uncut edges, price $1.25. Fleming H. Revell Co., Chicago.)

Four American Patriots, comprising the stories of Patrick Henry, Alexander Hamilton, Andrew Jackson, and U. S. Grant, by Mrs. Alma Holman Burton, issued under the general editorship of James Baldwin, Ph. D., is now ready. The book is adapted to the fourth, fifth, and sixth school grades, for supplementary reading. It contains 254 elegantly printed pages, and is neatly bound in cloth. Price, 50 cents.

The completion of this book adds another very desirable volume to the "Four Great Americans" series. These four famous Americans have been selected as subjects for this volume because their lives relate largely to the most pronounced military periods in our nation's history, up to the present war. In the story of Patrick Henry the author narrates in a most interesting way the events which led up to and immediately followed the Declaration of Independence. In the story of Alexander Hamilton is given, in a very happy manner, an account of the war for national independence and the framing and adoption of the Federal Constitution. In the story of Andrew Jackson, the development of the great West and the war for commercial independence, in 1812, are entertainingly treated. In the story of U. S. Grant, the author briefly but skilfully narrates the history of the expansion of territory to the Pacific Coast by the Mexican war, and concludes the volume by a sketch of the war for the preservation of the Union, in which General Grant was so conspicuous a figure. (Published by the Werner School Book Company, educational publishers, 378–388 Wabash Ave., Chicago.)

The September **Ladies' Home Journal** has an interesting article describing the daily life and training of the young girl who was crowned queen of the Netherlands in September. Her training has been closely supervised by her mother, who, though not a native of that country, has taken every pains to cultivate in her daughter those qualities most prized by the Dutch people. As a result, the Hollanders are looking forward to her reign with great joy, feeling that not only will she bring them a wise head to rule, but a sympathetic heart to guide. The same paper contains a report of an interview with Blind Tom, the famous negro pianist, who is still living.

The English Grammar of William Cobbett is issued in a revised and annotated form by D. Appleton & Co., New York. The book is unique in that it deals with the structure of the English

language by means of letters addressed by the author to his little son James, in which the subject is made very plain, and withal so entertaining that one reads for pleasure as well as profit. This grammar was written in 1817, but by the careful labor of Mr. Alfred Ayers, author of "The Verbalist," recently noticed in these columns, it has been brought down to modern usage — not by altering the original language, but by inserting the suggestions in brackets.

The book is neatly bound in cloth, embossed in jet and gold, with gilt edges. Price $1.

In **Mc Clure's Magazine** for September, Mr. George E. Graham describes the destruction of Admiral Cervera's fleet, as he himself had the good fortune to see the work done from Commodore Schley's flagship, the "Brooklyn;" and Mr. W. A. M. Goode describes it as he too saw it, from Admiral Sampson's flagship, the "New York." Together the two papers give a complete and most vivid account of what was undoubtedly the most picturesque event of all the war; and being illustrated with portraits of all the commanders, pictures of all the ships, and views of all the wrecks, largely from photographs taken by the authors, they leave nothing to be desired. Some very interesting reminiscences and letters of Mary Todd Lincoln, the wife of President Lincoln, are given in an article by her sister, Emily Todd Helm. The Indian chief Two Moon's story of General Custer's last fight, as taken down by Mr. Hamlin Garland, has, besides its value as being the Indian's version of a famous battle between him and the white man, that of a charming quaintness and ingenuousness. An exposition, by Mr. George B. Waldron, of "The Commercial Promise of Cuba, Porto Rico, and the Philippines," presents the possibilities of our recent conquests in most eloquent figures. Other features of the number — in addition to several short stories of unusual interest — are a fully illustrated article giving some marvelous facts regarding the action of volcanoes, by Cleveland Moffett, and an account of "How the News of the War is Reported," by Ray Stannard Baker. (The S. S. McClure Co., 141–155 East 25th St., New York.)

The Missionary Review of the World for September opens with a discussion by the editor-in-chief of the "Great Exigency in the Work of Missions." In this paper Dr. Pierson points out clearly the financial crisis through which missionary societies are passing, and then proceeds to indicate the causes and the remedy. Dr. George William Knox, formerly of Japan, contributes an article on "Events of the Past Year in Japan," and Rev. M. L. Gordon, of Kyoto, presents a full and able discussion of the "Doshisha" and the attitude of the Japanese Christians toward the action of the trustees. Two interesting descriptions of medical missions are furnished by Secretary Robert E. Speer, who tells of healing the sick in Persia, and by Dr. C. C. Vinton, who treats of the same subject in regard to Korea. Other articles are on "Christianity and Canteens in the Camps," "Fire-worshipers in Japan," "A Call from Chinese Christians," and "Some Recents Events in China." (Published monthly by Funk & Wagnalls Company, 30 Lafayette Place, New York. $2.50 a year.)

The September **Atlantic** contains a clear and concise editorial review of the international situation and the new duties and responsibilities devolving upon the United States in consequence of the restoration of peace.

Anything that is of practical benefit to mothers' clubs is, in this day and age, very welcome. The course of study published in the **New Crusade** for March and April, 1898, was received with much enthusiasm. The *Mothers' Club Helper*, issued monthly by the Wood-Allen Publishing Company, Ann Arbor., Mich., will be equally well received. It contains a well-directed series of questions upon the topics presented by the Course of Study, designates home readings, and presents a complete program for each meeting. It is the only complete guide for mothers' clubs yet published. It will be invaluable. (Price, 35 cents per copy for one year, $1.25 for 6 copies for one year, or $2 for 12 copies for one year.)

One hundred pages of reading-matter, with about seventy illustrations, make up the September Magazine Number of the **Outlook.** Half a dozen illustrated articles, a story, a sermon, war correspondence, and the usual full editorial and critical departments are included. Among the most notable of the articles are those on Bismarck, by Mrs. Susan W. Selfridge and the Countess von Krockow; Thomas Wentworth Higginson's "Anti-Slavery Days," illustrated by remarkably fine portraits from the collection of Mr. F. J. Garrison; Dr. Edward Everett Hale's "James Russell Lowell and His Friends;" Anna N. Benjamin's "Santiago after the Surrender," with photographs taken by the author; Dr. W. G. Frost's "University Extension in Kentucky," with unique pictures of curious phases of mountain life; and Alice Brown's story, "The Map of the Country." (The Outlook Company, 287 Fourth Avenue, New York. $3 a year.)

PUBLISHERS' DEPARTMENT.

THE members of the Michigan Press Association recently enjoyed the longest excursion trip ever taken by the association, and have embodied their thanks in the following resolutions, here printed in full: —

"WHEREAS, We, the members of the Michigan Press Association, have been so fortunate as to enjoy a pleasure trip of two weeks, extending nearly across the American continent — from Chicago to St. Paul over the Wisconsin Central, from St. Paul to Winnipeg over the Northern Pacific, thence west via the Canadian Pacific through the rich agricultural and grazing districts to the most northern railroad point on the continent — Edmonton; then through the grand scenic mountains whose beauty rivals the Alps, to the coast cities of Vancouver, Victoria, Seattle, and Tacoma: —

"*Therefore*, we take great pleasure in expressing in this feeble way our sincere sense of gratitude to those whose courtesy and hospitality have made it possible for us to make this annual excursion an educational trip which was one of the most important in the history of the Association.

"It is with especial gratification and pleasure that we acknowledge our indebtedness to the Hon. Clifford Sifton, Minister of the Interior of the Dominion of Canada, who last winter, as the representative of the Government, extended to us a most cordial invitation to take this trip as the guests of the Dominion and the Canadian Pacific Railway, and who, through his most courteous representative, Will J. White, of Ottawa, as Press Agent for the Dominion, has done so much to make our trip pleasant and memorable by antici pating our desires and providing every possible means for gratifying them.

"We are especially under great obligations to the Canadian Pacific Railway, the great trans-continental line, for its special train service for nearly 2,000 miles and return, and the many courtesies given us by its officers, President Sir William C. Van Horne, General Superintendent R. Malpole, General Manager William White; Robert Kerr, Traffic Manager; Arthur B. Calder, Traveling Passenger Agent; E. J. Coyle, District Agent; and Geo. Mc Laren Brown, Executive Agent. The Canadian Pacific is one of the world's greatest railway systems, and its officers we have found to be most obliging and courteous, giving every possible attention to our pleasure.

"We are also under great obligations to the Wisconsin Central for conveying our sleeping-cars from Chicago to St. Paul and return. Also to the Northern Pacific Railway for transporting our cars from St. Paul to Winnipeg, and for placing at our service the elegant steamer 'City of Kingston' for the enjoyable ride from Victoria to Seattle, and train service from Seattle to Tacoma; also to the Canadian Pacific Navigation Co. for the especial favors shown in transporting our party from Vancouver to Victoria; also to the Seattle and International Railway Co. for transporting us from Seattle to Mission Junction, and to the Soo Line for returning us from Moose Jaw to St. Paul — about six hundred miles. Also to the Chicago & West Michigan Railway, the Grand Rapids & Indiana Railway, the Michigan Central, the Grand Trunk system, and to other Michigan railroads for transportation to our homes.

"To the city of Winnipeg, which extended us such a cordial greeting on our entrance to Canadian territory, and which, through its mayor, Hon. A. A. Andrews, the city council, the board of trade, and its many public spirited citizens, gave us such a cordial reception and devoted every attention to us as the guests of the city. Also to the ladies who served us the elegant banquet at Elm Hall, and to the Nineteenth Battalion Band for the music provided on this occasion, and for the ball afterward, we are under lasting obligations. Also to the citizens of Winnipeg, Brandon, Souris, Griswold, Virden, Vancouver, Victoria, Regina, and other Canadian cities for the cordial public receptions given us, and especially are we grateful to them for the warm manifestations of friendliness and repeated assurances of interest and sympathy with the United States in the present war with Spain, and their enthusiastic endorsement of the proposed Anglo-Saxon alliance. Especially gratifying was it to us to have the cities we visited decorated with the stars and stripes and the Union Jack entwined, while the bands played our national airs. Especially will we remember with joy the greeting extended us at Griswold, where a hundred little girls, decorated with paper caps and red, white, and blue emblems, sang "America," "The Star Spangled Banner," and other patriotic airs, and presented us with bouquets of flowers.

"At Brandon we visited the government experimental farm, and were shown the great progress made in so practical a way in the development of the dominion, by experimenting with various products in the natural soil and climate in which they are to be grown. Also in their efforts to educate the young Indians of the country in a practical way at their mission school, thus fitting them to earn their own living instead of living as wards of the nation. We were also impressed with the rich, fertile agricultural resources of this vicinity. In this beautiful city, the home of Messrs. Sifton and White, our visit was made still more pleasant by the personal attentions of Mayor E. Evans and the city council.

"At Souris we shall ever remember the cordial reception by the mayor, council, and public spirited citizens, who, headed by the band discoursing patriotic airs, gave us a ride to the city park, where the ladies of the W. C. T. U. of the city had prepared us a most bountiful banquet, following which were warm welcomes from our Canadian cousins.

"To the citizens of Virden, who met us at the train with a band and escorted us to a near-by grove, where we were made to feel the enthusiastic welcome extended us all along the line.

"At Calgary we were addressed by the Governor-General of Canada, Lord Aberdeen, also treated to an exhibition by the wild Indians from a neighboring reservation.

"At Edmonton, the most northerly point that any railroad reaches, we were under obligations to the citizens for a drive about the city and a ride on the ferry over the rushing waters of the Saskatchewan River.

"To the superintendent of the Canadian National Park at Banff, Howard Douglass, we are under obligations for many favors, including a view of the only herd of wild buffalo in the northwest.

"At Vancouver, to Mayor Gordon, the city council, and board of trade for a delightful evening ride upon a steamer to the north inlet of the Sound, and for entertainment on board.

"At Westminister we were shown through the extensive salmon canneries, an interesting sight to us.

"At Victoria, where Mayor C. E. Redfern, the city council, and board of trade gave us a hearty welcome to the capital city of British Columbia. To the Marine and Fishery Department of the government for its use of their steam yacht for a delightful ride in the harbor, and to the Navy Department for the many favors shown on board the British man-of-war, 'Imperieuse.'

"To the citizens of Seattle for a ride about the city and on Lake Washington, and for the many favors shown us by the generous citizens.

"To the hospitable and public-spirited citizens of Tacoma, headed by our former Michigan resident, Orno Strong, and backed by Mayor Nickeus and the indefatigable Frank Cole, who had gathered the former residents of Michigan in this city, and induced the ladies to prepare an elegant lunch at the city park in the way of a clam bake, followed

by a steamer ride on the Sound, and a ride about the city, the prosperous appearance of which speaks volumes for the immense trade centering there.

"Also to the citizens of Indian Head, who on our return so hospitably entertained us with a dinner and a ride to the Government Experimental farm located there.

"To the royal entertainment accorded us at Regina on our return we are under lasting obligation, also for the warm words of friendship and brotherly affection shown, and the outspoken desire for a closer relation of the two great nations of the world. To the Commercial Club and the generous citizens of St. Paul and to their representative, H. B. Hall, who is endeared to Michigan editors by very many kindnesses, past and present, we tender appreciative thanks. Although arriving very late in that city, an elegant dinner had been prepared for us and was partaken of at the club rooms. We are also under obligations to the Western Union Telegraph Company for favors extended.

"We desire to return especial thanks to Will J. White, representing the Canadian Government, and to Arthur B. Calder, Traveling Passenger Agent of the Canadian Pacific, for their personal attention and supervision of the trip from first to last. It was owing largely to these two gentlemen that our trip was made so pleasant and profitable. We also wish to return sincere thanks to President H. R. Pattengill and Secretary H. C. Blackman for the painstaking care exercised in so successfully providing and arranging the details of one of the longest and most important excursions ever enjoyed by the Association.

"In conclusion, we would add that we recognize in the great agricultural resources of Northwestern Canada vast possibilities for its future. The expanse of territory between the Rocky Mountains and Winnipeg, reaching to Edmonton, and even beyond, is boundless in wealth for future generations, in grazing and raising all kinds of crops. It is but partially developed at present, and offers great inducements to homeseekers, and is destined to become one of the richest and most important sections of the North American continent. The scenery along the Canadian Pacific railway through the Rocky Mountains is grand and magnificent beyond comparison, and offers to the tourist greater delights than the Alps of Switzerland. It is also very rich in mineral wealth,— gold, silver, copper, and mica,— the development of which has but just begun.

"MARTIN E. BROWN,
"JAMES J. SAVAGE,
"FRANK N. GREEN,
"C. C. VAUGHAN,
"Committee."

THE OMAHA EXPOSITION.—When the World's Fair at Chicago ceased to exist, it was supposed that we should ne'er look upon its like again. However, the Trans-Mississippi Exposition at Omaha has effectively reproduced in similarity all of the buildings which made the White City so attractive in 1893. It does not now take weeks to wander through grounds and structures and then be compelled to go away with a jumble of ideas; for the Omaha Exposition people have profited by past experience, and have so improved the arrangement of exhibits that no more than two or three days of time need be consumed in admiration and inspection of the marvelous resources of the West, collected together in the chief city of Nebraska. Even the new Midway is a reproduction of the far-famed Street of All Nations of 1893, with many improvements upon the original. The electric lighting of the buildings, grounds, and lagoon at night makes a scene of enchanting beauty, alone worth traveling a thousand miles to see. The means of communication between the city and the grounds are ample, and the distance to be traversed is short.

The ways of reaching Omaha are innumerable, but chief among them is the direct Chicago and Omaha short line of the Chicago, Milwaukee & St. Paul Railway, with its electric-lighted, vestibuled trains, leaving Chicago every night at 6:15 p. m., and arriving in Omaha at 8:20 the next morning. Dining car service en route. Excursion tickets are on sale at every coupon ticket office in the United States over the Chicago, Milwaukee & St. Paul Railway through Northern Illinois and Central Iowa, as well as at 95 Adams St., and at the Union Passenger Station, Canal and Adams streets, Chicago.

A TWENTIETH CENTURY TRAIN. — Electric-lighted throughout (including lights at the head of each berth), the North Western Limited, which leaves Chicago daily at 6:30 P. M., and reaches St. Paul and Minneapolis early next morning, is regarded by the traveling public as the highest development in railway science. The train is equipped with buffet, smoking, and library cars, regular and compartment sleeping-cars, and luxurious dining-cars. The principal summer resorts in Wisconsin are most easily reached via the Chicago & North Western Railway, "the pioneer line west and northwest of Chicago." All ticket agents sell tickets via this popular route.