GOOD HEALTH

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THE PROGRESS OF MEDICAL KNOWLEDGE.

BY J. H. KELLOGG, M. D.

TWENTY-FIVE years ago we did not know much about the causes of disease. Dr. Oliver Wendell Holmes used to say that a medical consultation meant a gathering of doctors "to discuss questions about which none of them knew anything," and that was too true. Medical diagnosis was generally guesswork. I remember very well that when I first began the study of medicine, the stomach, the liver, and the whole abdominal region were a great mystery. Once, while delivering a lecture upon the diseases of the stomach, I had described seven such diseases. We describe twenty-six now. On this occasion, in the very midst of the lecture, a gentleman arose, pointed his long, bony finger at me, and said, "Young man, is that all you know about diseases of the stomach?" I repeated that there were seven kinds of dyspepsia. He said, "Young man, you don't know much about the stomach if you say there are only seven different kinds of dyspepsia, for I have had more than a hundred different kinds myself, so I know you have n't begun to study the subject yet." I felt considerably confused at first, but a happy thought struck me, and I explained to him that there are a great many varieties of diseases of the stomach arising from different combinations, and illustrated this by the law of permutations and combinations, telling him that by this law he would get several hundred varieties of the disease, and this satisfied him. But I went to my office and meditated upon the subject, and made up my mind that I did not know much about dyspepsia or indigestion.

What was true of indigestion in those days was true of almost every other malady. There was scarcely a disease which we could say we thoroughly understood, or concerning which we could give a confident opinion as to the quickest and best way to remove the cause, because we had not then the means of investigating these causes. Within the last twenty-five years, however, marvelous discoveries have been made in bacteriology, physiology, and other branches of medical science. Laboratory investigations and experiments have brought to light facts which are most wonderful and far-reaching in their influence, and of inestimable value in relieving human suffering.

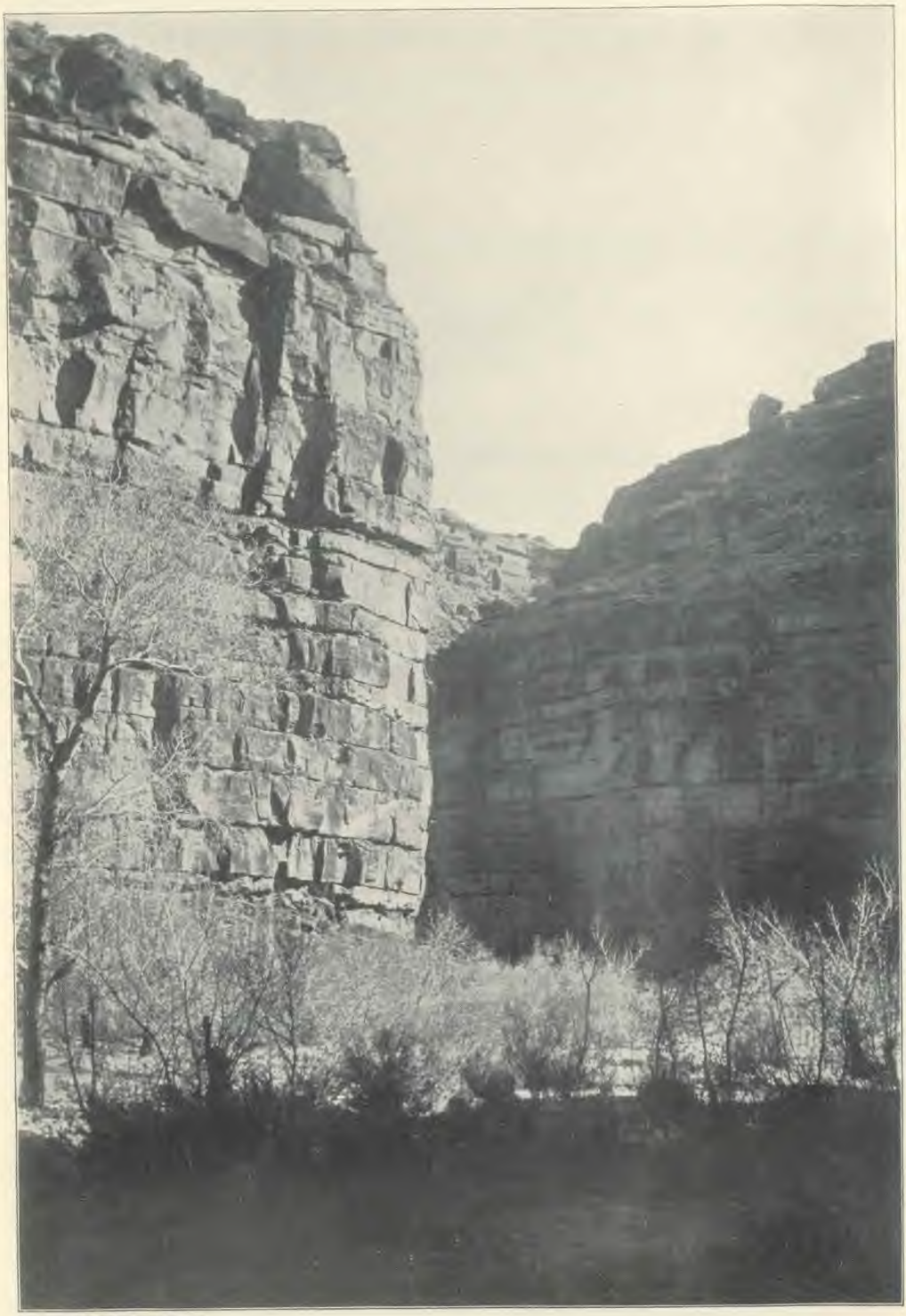
Probably the most important discoveries relating to germs and their influence and work have been made by Pasteur. About twenty-five years ago there was a discussion in the medical journals upon the subject of spontaneous generation. At that time, Professor Bastian and others claimed that plant-life and all the different species of animals, in fact, all living

creatures, were produced by an electric shock which caused protoplasm, this being afterward evolved, differentiated, and developed into various classes of animals, fish, and birds. Professor Bastian maintained that he had proved by experiments that germs originate spontaneously. He would boil test-tubes until, as he claimed, all the germs had been killed, and then would put them away for three or four weeks, when behold! he found germs in them. He thought that this proved his theory of spontaneous generation. But Pasteur found that if he boiled test-tubes long enough and hard enough, no germs existed in them after any length of time; not a germ appeared in the tubes if they were boiled at a temperature of 220° or 230°. Then he found that if he took these tubes up to the top of a mountain, having stopped them with plugs of cotton, he could remove these plugs for a time and then replace them, and no germs would appear in the tubes. But when this was repeated in the dense atmosphere of the lowlands, germs were found. This proved that Professor Bastian's tubes were boiled at too low a temperature and not long enough, so that the germs were not all killed.

When I was a medical student, twenty-five years ago, a story was told concerning an epidemic of typhoid fever — that people who drank water from the town well, which was filthy, died of the disease, while those who drank water from private wells escaped. About that time, Professor Tyndall made some investigations which proved that typhoid fever was due to the action of certain living germs. Others made further investigations to see if they could not find the unseen and mysterious cause of this disease. Doctors were extremely puzzled at that time to know where diphtheria, typhoid fever, and similar diseases came from. All of a sudden a healthy community would be alarmed by an outbreak of disease, by which hundreds of people would be stricken down; for example, in a little town in Pennsylvania, of some fourteen hundred inhabitants, nine tenths of the population were attacked by typhoid fever. About the same time, consumption was the subject of much discussion; it was believed to be a contagious disease, and Professor Koch claimed to have discovered the specific germ of consumption; he said that he had isolated it and could see it in a consumptive animal. Nine tenths of the physicians did not believe in this theory. When the State Board of Health of Michigan secured a law requiring physicians to report diphtheria as a "contagious disease," there was tremendous excitement. One doctor had a case of diphtheria, and, to show people how absurd this law was, he put a little patch of the diphtheritic matter from his patient's throat into his tobacco box, and used it with his tobacco, and within two weeks he died of the disease.

The investigation of germs has been going on during the last quarter of a century in every medical center in every civilized country, and physicians have been taking more and more interest in the subject from year to year, until now there is a large army of men who are devoting their whole lives to the discovery of these microscopic creatures, and their researches are every day bringing out new facts.

The number of different kinds of microbes and molds that have been discovered and analyzed does not begin to compare with the number of curious and interesting, and, in many cases, death-dealing classes of micro-organisms too minute for human power to recognize; there is an enormous amount of this kind of botany outside the range of our observation in the air we breathe, in the



SCENE NEAR CATARACT CAÑON SPRINGS AND YAVA SUPAI VILLAGE.

water we drink, and in the food we eat. This prodigious system of vegetable organisms outnumbers all the other organisms in the world put together. They are so minute that twenty thousand might be laid side by side, and the line would be only an inch long. Sometimes they are so numerous that half the mass of tissue which contains them is composed of germs. There are about one billion five hundred million people in the world, and about eight trillion germs in a cubic inch; so there are nearly six thousand times as many germs in a cubic inch as there are inhabitants on the face of the earth.

Physicians have shown us that these germs are the most important cause of all acute fevers, of infectious fevers, of eruptive fevers; all skin diseases; all catarrhs of the throat and stomach and other organs of the body; all catarrhal atrophies; all disorders of digestion; in fact, of the great majority of human maladies.

We are learning how to fight germs. Twenty-five years ago we did not know what to do with them. If we found a disease that other people were catching, we would simply shut up the sick to keep them away from the well, or keep the well away from the sick. If the well people were in the majority, we restrained the sick; if the sick people were in the majority, we restrained the well, so the method of proceeding depended upon circumstances. But we have found out, since the discovery of germs and the study of them, that Moses knew more in respect to germs and their habits than all his successors, and that the laws laid down by him are really the foundation of sanitary science. The investigations of the last twenty-five years have resulted in the building of an edifice of sanitary regulation, inspection, and disinfection based upon the laws of Moses. This is the reason that it has been possible to suppress the plagues which have spread over the continents of the world,—the black death, yellow fever, and other infectious maladies, some of which we never hear of nowadays. For instance, we seldom hear of typhus fever, except in Mexico. In the early part of the century hundreds of people used to die of it in this country and in England, especially in London. But now it is practically unknown here except on the southern border: it is not seen in England, France, or Germany; it is an unknown thing in these countries because it has been stamped out by a proper understanding of its causes and by the proper restricting of patients so that others may not contract the disease by contagion.

We have learned about disinfection. We have learned that germs can not live in the sunlight. We used to know that a house with no cellar and not shaded by trees was healthier than one with a cellar and shaded. But why? Now we know that the house needs sunlight to disinfect it and clean out the germs. We have found out that various substances will kill germs — that sulphur and formalin will do it without killing the people at the same time. We have learned that sulphurous oxide is a powerful poison, that formaldehyde is not so very irritating, and consequently not such a deadly thing to have about.

But one of the most interesting discoveries yet made with relation to germs is their bearing upon our lives. It has been found that they are the greatest cause of disease; and also that they act only in connection with bad habits — in connection with some injury to the body; that a perfectly sound body can not suffer from the inroads of germs. Hence we conclude that the greatest danger from germs is from a wounded or diseased body.

The discovery of germs has made pos-

sible marvelous strides in surgery. I remember with what awe I used to hear physicians talk about laparotomies, ovariotomies, removing tumors, and operating upon the stomach. These operations were not very common twenty-five years ago. If doctors performed operations of this kind upon patients in those days, they had a reasonable expectation that at least one out of every four of their patients would die. The profession was electrified when it was telegraphed across the Atlantic that Prof. Spencer Welles had operated upon one hundred cases, and not a single patient had died. In those days if a man had his leg cut off pretty close to the hip, there was at least one chance in four that he would die. When a doctor performed an operation, he scarcely expected that the wound would heal by immediate union; he expected some suppuration. In those days doctors called a discharge from a suppurating sore "healthy," or "laudable pus." Now we should say in such a case that it was a dirty doctor, and not laudable pus, that brought about that condition; for if the doctor's hands and instruments had been clean, and he had taken pains with his operation, he would have had no reason to expect "laudable pus" or any discharge at all from the wound. Doctors nowadays scout the idea of "healthy pus." All pus is the result of disease, of the infection of germs. Through scientific discoveries, physicians have now found it possible to avoid pus and to secure immediate union. The discovery of the proper means of disinfection has made it possible to perform operations upon the body that could not possibly have been undertaken with success twenty-five years ago — operating upon the abdominal cavity, for example. Sometimes tumors weighing one hundred pounds or more are removed. A kidney is sometimes removed, and the patient enjoys better health with one kidney than he ever did with two; the whole spleen has been removed, and sometimes several feet of the intestines have been taken out, and yet the patients recover and enjoy excellent health. Even the stomach is now removed with success. Not only has a portion of the liver been cut away, but the entire gall-bladder has been removed. When the lung cavity has been affected, portions of the lungs have been excised. There is now no part of the body that is absolutely sacred and secure from the surgeon's knife. The brain cavity has often been invaded, and tumors removed from it; deep cuts have been made in the brain, and bullets and other objects have been taken out, and still the patients have lived. It is only when germs follow the surgeon's knife into the wound that suppurations ordinarily result.

Germs can have no power over a human body except in conjunction with bad habits of life. The knowledge of this fact has led to the study of dietetic habits, which twenty-five years ago were almost entirely ignored. There has been a great revolution in the matter of diet. At the Philadelphia Centennial, there was a place called the Dairy, where they had a new food which was placarded all around as "Avena." It was nothing but oatmeal. Oatmeal was not popular then, but people would eat it under the name of "Avena," not knowing that it was nothing in the world but common oats, such as are fed to horses. But now oatmeal is very popular. I do not suppose you could find a hotel in the country but has oatmeal on its bill of fare. The making of oatmeal has come to be a prodigious industry.

The belief used to be almost universal that tea and coffee were strengthening foods, and substitutes for other foods; that they possessed some mysterious vim that made them wholesome. Any one who objected to the use of tea and coffee was considered a crank. But now

many argue against their use, and thousands of people refuse to touch them, knowing their injurious qualities. Twenty-five years ago such condiments as mustard, pepper, and peppersauce were used without thought of harm; to-day we find the text-books and physiologies which the children study and even the newspapers teaching the harmfulness of these things.

Twenty-five years ago a vegetarian was hissed. Now the progress that has been made in dietetics and in the knowledge as to the constituents of food is really encouraging. Twenty-five years ago nobody knew how much food to eat or what to eat. People did not know how much albumin or fat or starch they needed, while to-day physicians are teaching what proportion of food elements a person requires — seven parts of albumin, three parts of fat, and forty parts of starch and sugar put together, or about twenty ounces in all — to sustain health. There is a wonderful waking up all over the civilized world in regard to the importance of correct habits of life.

Twenty-five years ago, alcohol as a stimulant was considered a necessity. If a man had typhoid fever, he was to be virtually drowned in alcohol. Professor Austin Flint used to instruct medical students to give alcohol to patients who had typhoid fever, and to increase the dose until it was from two to three pints a day; the consequence of this treatment was that the patient was kept intoxicated all the time. The same thing was true in cases of consumption. If a man had a cough, he was made drunk.

Again, we do not hear so much as we used to about "antidoting bad habits." You might as well talk about curing a propensity to lie or swear or steal by hypodermic injections as to talk of curing a man of the results of his bad habits by swallowing a few drops of medicine. This idea is now considered by the profession as a fallacy. Men and women are finding that bad habits prepare the soil for the growth and development of germs, and that all diseases have their foundation in bad habits, in every-day bad habits,— at the dinner-table, in wrong dress, lack of exercise, lack of sleep, dissipation, and in trying to rob nature in different ways. It is these wrong habits that lay the foundation of disease through weakened vital resistance, and the body becomes an easy prey to the microbic influences which assail us on every side.

We have great reason to be thankful that we live in an age when doctors have found out that there is some relation between disease and wrong habits; that their attention is more and more concentrated upon this one truth,— that disease is founded upon wrong habits of life, and that the cure is to be sought in helping nature to build up a sound body by strengthening and elevating the vital functions and the living tissues.

LORD! all thy works are lessons; each contains
  Some emblem of man's all-containing soul;
Shall he make fruitless all thy glorious pains,
  Delving within thy grace, an eyeless mole?
Make me the least of thy Dodona grove,
  Cause me some message of thy truth to bring,
Speak but a word to me, nor let thy love
  Among my boughs disdain to perch and sing.

— *Lowell.*

A Portion of the Trail on the Way to the Yava Supai Village.

THE YAVA SUPAI INDIANS AND THEIR CATARACT CAÑON HOME.[1]

BY GEORGE WHARTON JAMES.

OF no tribe of Indians in the United States have more wild nonsense and foolish exaggerations been written than of the Yava Supais. Men who merely heard of but never saw them wrote outrageously false accounts as to their place of residence, their stature, their ferocity, their cliff-dwellings, and of a people whom they held in cruel slavery and degrading bondage. Such statements could not be controverted, as not ten white men could be found, fifteen years ago, who had ever visited the Yava Supais in their Cataract Cañon village, or knew anything whatever of their life and habits. Seventeen or eighteen years ago Lieutenant Frank Hamilton Cushing, of the U. S. Bureau of Ethnology, who was then prosecuting his researches in the ancient villages of Zuni, traveled across the desert to the Kuhni-kwe, as the Zuni called them.

Three hundred and fifty years ago they were first seen by white men. Coronado's great army, which had marched up from Mexico into what is now New Mexico, in search of the famed "Seven Cities of Cibola," had discovered Cibola in Zuni, but the Spanish gold hunters were disappointed in not finding there the gold their fancies had anticipated. So Coronado sent out forces in different directions, in quest of places and peoples that they might pillage. One of these parties reached the Grand Cañon of the Colorado River in Arizona, and there found a small band of the Kuhni-kwe, whom they termed Coconino (pronounced Ko-ho-nee-no), a name near enough to the Zuni name to show its origin.

Lieutenant Ives, who made an exploration of the Colorado River in 1857–58, also visited them in their cañon home.

These three visits are about the only known intercourse with the white man the Yava Supais have had in their own home, until, about three or four years after Cushing visited them, Mr. W. W. Bass, who had been a train despatcher on the New York Elevated Railway, and who had come to Arizona for his health, found his way into the heart of Cataract Cañon, and formed an acquaintance with the son of the chief of the tribe. Two or three years later Mr. Bass took me to see the people whom he had found so interesting, and from that time until now I have periodically visited them.

Cataract Cañon is one of the chief tributaries of the Grand Cañon of the Colorado River, reaching the main cañon in its most sublime portion. It more nearly conforms to the popular notion of a "cañon" than the great waterway itself, for, when one arrives within a few miles of the village of the Yava Supais, the opening between the walls becomes very narrow, while the walls themselves tower up two thousand and more feet in direct, vertical height.

To reach Cataract Cañon a wagon must be taken from Ash Fork, on the main line of the Sante Fé. Sixty-five or seventy miles across a portion of the forest that fringes the southern edge of the Painted Desert, then over that wondrous nature palette, on which miles of color have been squeezed from the Almighty's

[1] The illustrations used in connection with this article are all copyrighted by George Wharton James.

own tubes, finally reaching the western limit of the vast Coconino Forest — this is a good drive for two days, especially if undertaken in the hot summer months.

Coming at last upon an Indian trail, this is followed until a sheer drop into the cañon, nine hundred feet below, is reached. On either side the cañon walls are precipitous, so that not only does further descent seem impossible, but no means of egress is provided except to return the way we came. Had we been alone, there is little doubt that this had been our course of action, but having some Indians of the Supai people with us, the trail was soon pointed out, traversing horizontally the face of the bluff to the right. As Ives describes it: "A short distance off it seemed as if a mountain goat could scarcely keep its footing upon the slight indentation that appeared like a thread attached to the rocky wall, but a trial proved that the path, though narrow and dizzy, had been cut with some care into the surface of the cliff, and afforded a foothold level and broad enough for both men and animals."

Then follows Lieutenant Ives's description of the descent, which I think interesting and vivid enough to reproduce here: "I rode upon it first, and the rest of the party and the train followed, one by one, looking very much like a row of insects crawling upon the sides of a building. We proceeded for nearly a mile along this singular pathway, which preserved its horizontal direction. The bottom of the cañon, meanwhile, had been rapidly descending, and there were two or three falls where it dropped a hundred feet at a time, thus greatly increasing the depth of the chasm. The change had taken place so gradually that I was not sensible of it, till, glancing down the side of my mule, I found that he was walking within three inches of the brink of a sheer gulf a thousand feet deep; on the other side, nearly touching my knee, was an almost vertical wall rising to an enormous altitude. The sight made my head swim, and I dismounted and got ahead of the mule, a difficult and delicate operation, which I was thankful to have safely performed. A part of the men became so giddy that they were obliged to creep upon their hands and knees, being unable to walk or stand. In some places there was barely room to walk, and a slight deviation in a step would have precipitated one into the frightful abyss. I was a good deal alarmed lest some obstacle should be encountered that would make it impossible to go ahead, for it was certainly impracticable to return. After an interval of uncomfortable suspense the face of the rock made an angle, and just beyond the turn was a projection from the main wall with a surface of fifteen or twenty yards square that would afford a foothold. The continuation of the wall was perfectly vertical, so that the trail could no longer follow it, and we found the path descended the steep face of the cliff to the bottom of the cañon. It was a desperate road to traverse, but located with a good deal of skill — zigzagging down the precipice, and taking advantage of every crevice and fissure that could afford a foothold. It did not take long to discover that no mule could accomplish this descent, and nothing remained but to turn back. We were glad to have even this privilege in our power. The jaded brutes were collected upon the little summit where they could be turned around, and then commenced to re-perform the hazardous journey."

After another desperate attempt, in which one member of the party came near losing his life, Lieutenant Ives finally reached the village.

Prior to our visit the Supais had cut the trail down this vertical section of rock, so that, although it was dangerous and

GOVERNMENT HOUSE, YAVA SUPAI VILLAGE, CATARACT CANON, ARIZONA.

dizzy work, we were able to continue to the bottom.

That night I camped outside the *ha-we*, or wicker hut, of Yu-no-si, the eldest son of Kohot, the chief of this interesting nation. Was there ever before such a sublime place used by man as a site for his home? Travelers come back to their native land full of descriptions of the great temples of the Nile, and the wonderful ruins of vast structures found elsewhere in the world, but where has man ever contrived and erected dwellings between walls of rich red sandstone formed of layers so perfectly and harmoniously placed that they appear as if laid by a master mason, and that tower into the pure cobalt sky two thousand feet and more above? A sensitive soul is ever awed, a petty soul dwarfed, and a religious soul elevated by contemplation of them.

I was invited to share Yu-no-si's ha-we, but when I found that in that one hut, not only his own family,—himself, wife, several sons and daughters,—but also a number of relatives, male and female, were all to be accommodated, I declined the offered hospitality, with thanks.

BRIDAL VEIL FALLS, CATARACT CANON, ARIZONA.

Next morning I began my studies of the Yava Supais, which have afforded me much pleasure and gratification ever since. Not far away I saw an aged and almost helpless old man, perfectly nude, struggle under a wicker frame which his daughter then covered over with blankets. A basket, holding water, was placed inside, and then every few moments hot rocks were dropped into the water. Before long the old man was in a perfect

steam bath, in which he remained for almost half an hour. Then, hastily casting aside the blankets and wicker frame, the woman poured two or three large ollas full of cold water over her helpless parent, after which she wrapped him up in one of the blankets, and left him to dry in the sun.

This primitive Russian bath is largely used by the Yava Supais, and I have seen a score of men and women, after taking it, dash into one of the deep pools formed where their creek is dammed up for purposes of irrigation.

Most of these people are very fond of swimming, and especially during the summer can one see them disporting themselves in the water. Last year I saw about thirty young men building a ditch, and after they had worked until they were in a state of copious perspiration, they would jump into the water, swim for a few minutes, and then stretch out, naked, in the sun.

The food of the Yava Supais is neither epicurean nor widely varied. During the hunting season antelope, deer, and mountain sheep are brought in, the two former from the Coconino Forest and the mountain slopes both north and south of the Grand Cañon, and the latter from the deep defiles of the cañon itself. The meat they cut into strips and dry in the sun. It can then be kept indefinitely, and is used as a relish to vegetable food when flesh-meats can not be obtained. They will also eat rats, mice, gophers, and squirrels when other meat is scarce, but fish and any kind of pork they decidedly refuse. Their chief foods, however, are peaches, melons, corn, squash, the seeds of various wild grasses, roots, the fruit of the prickly pear, and the small but delicious edible nuts of the piñon, a species of pine.

Their peach orchards are scattered throughout the area of their village, which occupies the wider portions of Cataract Cañon, where much good sandy soil has become lodged. The *tha-pa-la* (peach) was undoubtedly brought to them by the Spaniards, or at least gained from those who had received it at the hands of the Conquistadores. Though they have no budded varieties,—for all their trees are grown from seed,—their peaches are of a fair quality both as to flavor and sweetness. Large quantities of the peaches are dried and stored either for sale to the white miners, prospectors, lumbermen, or others, or for their own winter use.

Corn has been their food for centuries. In the cliff- and cave-dwellings of their prehistoric ancestors, corn has been found, which, when planted, grows fruitfully. By irrigation good crops are produced, and, perched away up in inaccessible places of their two thousand-feet-high cañon walls, are several storage caves where it has been the custom of the "fathers of the people" to store a supply

CATARACT CREEK, BELOW YAVA SUPAI VILLAGE.

of surplus corn for cases of emergency, such as famine, fire, destruction of crops, or a siege. The means of access to these caves are secret, no white man having any idea how these aërial stores are reached. It should be noted that their corn is of a dwarf species, but very prolific, and is of variegated and different colors. These different colored corns are used in their religious ceremonials, certain colors having distinctive meanings, and being offered to the powers of the seven cardinal points; as, for instance, red to the north, blue to the west, black to the south, white to the east, gray up, pink down, and yellow for the "here."*

YU-NO-SI'S WIFE AND DAUGHTER.

Melons are generally eaten long before they are ripe. The digestive apparatus of a Yava Supai seems to be trained from childhood to bear the burden of such heavy loads. Squashes are not only eaten when ripe, but are cut into circular pieces, threaded on yucca fibers or thrust upon sticks, and dried in the sun. Thus provision is made, with dried meat, corn, peaches, and squash, for winter, when food is scarce and difficult to obtain. This displays a careful and provident disposition not generally associated with Indian character. But it is common with all the pueblo, or village, Indians of the Southwest as well as the Yava Supais.

The wild grasses used to give abundant seeds from which excellent and nutritious meal was made. When I first visited these people, before the cattle of the white men had so eaten down the natural pasturage that verdure became too scarce to allow time for seeding, it was no uncommon thing to see half a dozen women start out from the village, with their *kathaks* (or large baskets) on their backs, suspended by a broad rawhide band from their foreheads. Up the steep trails of the cañon sides they would climb with toilsome steps, and, arrived at the pastures, which in various places in the forest were very rich, would proceed, by means of a small flat basket held in the right hand, to strike the seeds into the *kathak*. The baskets full, the seed gatherers slowly, yet gladly, returned home, to add the unsown harvest to their store.

The prickly pear,— a species of cactus, — the amole, and other yuccas grow profusely in the Coconino forest region, and the fruit of these desert plants is eagerly gathered and used as food. The fruit of the amole is placed in the fire and the outside burned to a cinder. When cool, the burned portion is cut off, and a somewhat sickish-sweet, vegetable-tasting fruit

* I do not give these colors and points as accurate, for my note-book is not at hand, but as illustrative of the facts.

is the result. After a long, hot ride I have often eaten it, and found it both grateful and refreshing.

The nuts of the piñon are sweet and nutritious, and were it not for the slow process of hulling them, one could well enjoy a good meal of them.

Another distinctive Supai food is the mescal. This is the fiber of one of the yucca species, macerated, cooked on heated rocks, and flattened out into large sheets, which are then stored for winter use. It is a sickish-sweet food, not, however, unpleasant if one can compel himself to overcome the first sensations of its peculiar flavor.

Corn is cooked in a variety of ways. It is roasted whole, "roasting ears" being as great a delicacy among the Yava Supais as in New England. Indeed, the largest and finest roasted corn I ever ate was ten or twelve years ago at the ha-we of my friend Yu-no-si in Cataract Cañon. Parched, it is the standby of an Indian who wishes to make a long and arduous journey over the hot, sandy, and waterless desert. With a small sack of parched corn he will journey an incredible distance, where few white men could possibly live, and come back little the worse for his outing. During the time of corn gathering it is often stewed with those portions of the meat and the bones which are not suitable for drying.

Their mills for grinding are primitive mortars and pestles made of rough basic rock or fine-grained lava, with here and there a *metate* similar to those used by the Pueblo Indians or the aborigines of California. The metate is a flat rock placed in a sloping position, up and down which a narrow slab of similar rock is pressed. The woman kneels before and over the metate, takes the narrow slab in both hands, throws a handful of corn on the upper part of the slab, and then proceeds to rock her body back and forth or up and down, pressing the narrow slab upon the sloping metate, and thus grinding the corn. The dull monotony of the movement, the slowness of the process, and the steady strain upon the muscles renders this grinding an occupation more laborious than many white women would care to undertake, but there is little question that to this constant labor much of the sturdy pelvic development of the Yava Supai and the Pueblo women is due.

Until white men introduced that frightful source of destruction to the Indian — baking-powder — all bread was unleavened. It is still so made, though not as much as formerly, and generally in three ways, the commonest of which is the tortilla. A large, flat rock is placed over a fire, a piece of dough — simple flour and water — is flattened out by the fingers until it is as large as required, then thrown upon the heated surface. As soon as one side is baked, it is turned over. The same rock is used for the making of *piki*, but for this the corn-meal must first be prepared into a thin batter. Then the fingers are dipped into the mixture and hurriedly skimmed over the heated stone, so that a bread far thinner than the finest wafer is the result. These thin sheets are folded together, and make a by no means unpleasant food. The Supais learned how to make piki from their friends, the Moki. Unleavened cakes are made by placing them either in the ashes of a camp-fire — the only fires the Supais have — or on flat rocks which have been heated in the fire.

Mush is made by mixing the meal in hot water. Nowadays many of the Supais have copper or tin kettles and pans for this purpose, but when I first visited them, all water was heated in one of two ways. The only water utensils for cooking purposes that they had were made of wickerwork — saucer-shaped baskets in fact. These were so closely woven that they would hold water. The liquid was

made hot by dropping hot rocks into it. Soups were made and meats cooked in this way. Or, now and then, a woman would be found who would cover the bottom of her basket with a mixture of sand and clay, and then place it directly over the coals. This is undoubtedly the way in which the manufacture of pottery was discovered. Sometime or another the clay covering, hardened by the fire, fell from the basket, when it was found to be solid, and capable of holding water. With a bowl thus ready formed to hand it was no effort of the brain to imitate in clay the shapes the basket had already attained. I have found baskets still coated in the manner described, and seen them actually in use among the Yava Supais, and many a meal has been cooked in my presence by both methods here described.

KOHOT, THE LAST SUPAI CHIEF.

In physical development the Yava Supai men more nearly approach the Caucasian than the majority of North American Indians. They are seldom corpulent, but are athletic, muscular, full chested, broad shouldered, and well boned. Most of them are industrious, keeping their corn fields in good order, caring for their irrigating ditches, repairing the dams, hunting, etc., constantly. Up to thirty or thirty-five years of age the men look young,— their faces are round and full, and few lines of care are traced on cheeks or foreheads; but, generally, after that age they begin to grow old rapidly. They become wrinkled and care-worn, and while retaining a plumpness of form, an activity that is remarkable, and a vigor that years seldom diminish, they impress one as old men, instead of middle-aged and in the prime of life.

As a rule they are sociable, good-natured, hospitable, and peaceably inclined. Of course, childlike curiosity and inquisitiveness are dominant traits. Some years ago I had the misfortune to lose

my canine teeth on both sides of the upper jaw, and I supplied the loss, by the aid of the dentist, with false teeth and a gold plate. One morning when I was performing my rising ablutions at one of the pools in Cataract Creek, a number of the Supais came and watched me with great interest. The way I scrubbed my hands and then "soused" my hair and beard was evidently fascinating to them, but when I took my tooth-brush and began to use it, their curiosity knew no bounds. Suddenly, as the gleams of sunshine struck the gold plate on the roof of my mouth, one of them caught sight of it, and immediately told his astonished friends that I had a mouth of gold. First one and then another came and begged to be allowed to peer into my mouth, and see the wonderful and almost incredible thing. After I had enjoyed their astonishment for a while, I suddenly removed the plate, and held it in my hand. Such an uncanny thing they had never seen before, and some of them were really alarmed. The more curious, however, began to ply me with questions, and my guide jokingly told them that I was "built up all over in the same way; that if they should take hold of my arms and legs and fingers, they would all unscrew, and could be removed; my eyes were interchangeable — I could put the right eye into the socket of the left, and turn my nose upside down, etc., etc." For a while I was made miserable by the movements of my new friends, for as the news spread throughout the village, first one, then another, would come and endeavor to unscrew my arm or leg, twist my nose upright, or gouge out an eye. The guide and the Indians had more fun than I, and I vowed to get even with him for telling them such a yarn. As soon as they understood the hoax, the Supais had as good a laugh as we; but from that day to this

KOHOT'S ELDEST WIFE.

they have never forgotten the fun caused by my gold plate.

The last chief of the Supais, Kohot, died as recently as the fall of 1898. He was a sturdy old fellow, brave, dignified, and pathetically sad at the gradual decline of his people. Just a few months before his death I succeeded in obtaining his photograph, which he never before would allow. Then his oldest wife posed — they are polygamists — and laughed at my efforts to induce her to "spread her skirts," she having thrust them between her legs to make herself appear as much of a man as her husband.

The young men spend a great deal of their time during the season in hunting, in keeping their irrigating ditches in repair, and helping the cattle men of the plateaus above the cañon, and the mining prospectors who visit the Grand Cañon. The boys use the bow and arrow for a source of amusement as white boys use tops, and become expert in their use.

The young people of both sexes play a game called *hue-ta-quee-chi-ka*. The players sit on one side of a circle of stones, about forty inches in diameter, called *yam-si-kyalb-yi-ka*. There is a small opening in the circle to denote beginning and ending points. In the center of the circle a flat stone is placed, called *ta-a-hi-chi-ka*. The game is played by throwing three sticks — *toh-be-ya* (which are marked so as to represent dice) — upon the center stone, and scores are made according to the way the dice fall. At the time I made the accompanying photograph nine girls were playing, four constituting one side, and five the other. In their turns the girls threw the dice upon the stone, and the scores were counted on the circle of stones and marked by a stick thrust in the proper place. One side of the dice-sticks was red, the other white. If three whites came up, ten were counted; three reds, five; two whites and one red counted two, and two reds and one white counted three.

SCHOOLGIRLS PLAYING GAME OF HUE-TA-QUEE-CHI-KA.

THE EFFECT OF ALCOHOL UPON THE FUNCTIONS AND STRUCTURES OF THE STOMACH.

BY W. H. RILEY, M. D.,

Superintendent of the Colorado Sanitarium, Boulder, Colo.

(Continued.)

THIS series of experiments was also made upon dogs, for the purpose of determining the effect of alcohol and alcoholic liquors upon the digestion of food in the stomach of the animal. As in the other series, an opening was made through the abdominal wall and into the stomach, and through this a tube was placed for the purpose of injecting fluid into and withdrawing it from the stomach. The animals were fed fifty grams of finely chopped meat each time. A certain amount of fluid was then injected into the stomach through a tube. In some instances pure water was used in different quantities. In others a certain amount of fluid containing a definite amount of alcohol or alcoholic liquors was injected. At intervals of from one fourth to one half an hour, small quantities of the gastric contents were permitted to flow out of the fistula, and carefully analyzed. The time required for the stomach completely to digest the fifty grams of meat was noted in each case. This was really the particular thing that determined the effect of alcohol upon digestion. If, for instance, it took longer when a certain amount of alcohol was introduced than it did when alcohol was absent, the conclusion was that alcohol retarded the digestion of food. The following tables are given for the purpose of comparison: —

EXPERIMENT II.

9 : 10 A. M. 50 grams meat, 50 c.c. of water.

ANALYSIS OF CONTENTS.

Time.	Total acidity.	Loosely combined HCl.	Free HCl.
9 : 30	0.241	0.144	0.093
10 : 00	0.295	0.169	0.108
10 : 20	0.367	0.216	0.115
10 : 40	0.439	0.288	0.144
11 : 30	Stomach empty; end of gastric digestion.		

Time of digestion, 2 hours and 20 minutes.

EXPERIMENT IX.

9 : 15 A. M. 50 grams meat, 50 c.c. of 30 per cent. alcohol.

ANALYSIS OF CONTENTS.

Time.	Total acidity.	Loosely combined HCl.	Free HCl.
9 : 40	0.191	0.130	0.058
10 : 05	0.335	0.155	0.151
10 : 30	0.421	0.176	0.180
10 : 50	0.468	0.184	0.201
11 : 10	0.460	0.165	0.220
11 : 30	0.410	0.148	0.220
11 : 50	0.468	0.195	0.244
12 : 10	0.417	0.112	0.240
12 : 30	0.360	0.086	0.216
1 : 00	Stomach empty; end of gastric digestion.		

Time of digestion, 3 hours and 45 minutes.

In the first instance, fifty grams of meat were given to the animal, and fifty c.c. of water injected through the tube. The time of digestion was two hours and twenty minutes. In the second instance fifty grams of meat were fed the animal, and fifty c.c. of a thirty-per-cent. alcoholic solution was injected. In this instance it took three hours and forty-five

minutes to digest the same, a difference of one hour and forty-five minutes, or when expressed proportionately, one and one-half times the time of digestion when alcohol was not injected. And so it was found in the course of these experiments that the time required for the digestion of food was greatly prolonged in nearly every instance where alcohol was introduced into the stomach of the animal experimented upon.

That part of our subject which treats of the effect of alcohol upon the digestion of food in the stomach of the lower animals and man we shall deal with more directly under its proper head; and shall have occasion to call attention to the fact that almost without exception the investigators who have studied the effect of alcohol upon digestion have shown that alcohol retards it. Professor Chittenden, in his studies to "determine the effect of alcohol upon the secretion of the gastric juice," has emphasized the fact that although the secretion of gastric juice may be for a time increased by the influence of alcohol, yet this increased secretion is of no value, for instead of its hastening the digestion of food, as one might naturally expect, in almost every instance the time of digestion was lengthened by the presence of alcohol in the stomach.

More than this, the experiments made upon healthy young men with reference to the effect of alcohol upon the secretion of the stomach show conclusively that alcohol and alcoholic liquors diminish it rather than increase it. The experiments of Dr. Kellogg, of the Battle Creek (Mich.) Sanitarium, speak directly upon this point. His experiments are referred to in detail later in this article. We wish in this connection simply to call attention to the fact that these experiments of Dr. Kellogg show that the alcoholic liquors, such as claret, whisky, etc., diminish the secretion of the gastric juice, as well as of free hydrochloric acid and combined hydrochloric acid, in man.

THE INFLUENCE OF ALCOHOL UPON THE CHEMICAL CHANGES IN FOOD DURING DIGESTION.

We have already found that the purpose of digestion is to change food from an insoluble to a soluble form, and prepare it for absorption into the blood. We may now consider the effect of alcohol and alcoholic liquors with reference to those changes which take place in food whereby it is prepared for absorption. It must be evident to all that this part of our subject, which deals with the effect of alcohol upon the chemical changes taking place in food while in the stomach, is the most important of all these questions; for, if alcohol hinders or prevents the digestion of food in the stomach to any degree, it must be evident that it is a harmful substance.

With reference to the effect of alcohol upon the chemical changes in food during digestion in the stomach, experiments have been conducted by various investigators along three different lines; first, to determine the effect of alcohol upon the artificial digestion of albuminous or proteid foods. The writer has conducted a series of such experiments as follows: —

A certain amount of egg albumen was weighed and placed in a definite amount of artificial gastric juice; that is, a solution containing pepsin and .2 per cent. of free hydrochloric acid, which is the normal amount of acid in the stomach. To this a certain amount of water, or an equal quantity of alcoholic liquors, such as rum, brandy, or whisky, was added to each of the different flasks, and all were put away at the proper temperature for digestion. The flask containing water was used for comparison with the other flasks containing alcoholic liquors. The length of time it took to digest the egg albumen,

which was of the same weight in each of the different flasks, was noted. It was found that in the flask containing artificial gastric juice and pure water the digestion was complete at the end of the fourth hour, while in every case in which an equal quantity of alcoholic liquors was used in the place of water, the time required was prolonged. Experiments were made with nearly all the different kinds of alcoholic liquors, such as rum, sherry, wine, Holland gin, grape brandy, rye whisky, blackberry wine, etc. In some cases the time required was eight or nine hours, or more than double the time required for the digestion of the egg albumen where only pure water was used. The retardation of digestion was greatest when those liquors containing the greatest amount of alcohol, such as rum, whisky, etc., were used.

It is very evident to the writer that all the alcoholic liquors mentioned do retard the artificial digestion of albuminous foods to a very marked degree. More than this, we find that our own results are in perfect harmony with those of every other investigator with whose work in this line we are acquainted. For instance, Bikfalvi found that alcohol, even in small quantities, retarded to a marked degree the artificial digestion of albuminous foods. Kliklovicz found that alcohol and alcoholic solutions, when present in five-per-cent. amounts, and especially when ten per cent. was present, produced a marked retardation in the artificial digestion of albuminous food. The stronger the alcoholic solution, the greater was the retardation; and those solutions containing fifteen, twenty, and thirty per cent. of alcohol checked the digestive processes in a very noticeable manner. More recently, Roberts has conducted a series of experiments in artificial digestion in the presence of alcohol. As a result of his researches, he found that solutions containing ten per cent. or more of alcohol retarded digestion to a very marked degree.

(To be continued.)

PUBLIC BATHS.

BY KATHERINE LOUISE SMITH.

THERE is no reason why all American cities should not avail themselves of the very best experience of the world, adapting it to local conditions. One can hardly estimate the importance of a system of public baths in our large cities. By a public bath is meant an establishment where a hot or a cold water bath may be had the year round. No argument should be needed to prove the value of these institutions. They have been appreciated wherever they have been established, and have contributed to lessen the death-rate in large cities. Pliny wrote of Rome, "The city needs no medium but hot baths," and it is certain that they diminish disease among the lower classes.

Upon the well-being of the skin the health of the body largely depends. Prevention is more potent than cure. The relation between health and cleanliness must be firmly established in the minds of the people, to have cleanliness presented from the health side. People who are obliged to live under unwholesome conditions can not develop morally. How can they be clean when the water-supply is small and to be obtained, as in most tenement houses, from one faucet in a dark hall? When people learn that cleanliness of body means less discom-

fort from heat and cold, public baths will be maintained at municipal expense.

One must turn to the experiences of baths in Europe, for there is in this country no guide on a large scale. It has scarcely occurred to our cities that it is economy to wash, and that every person who bathes lessens the demands on the health department.

Liverpool in 1842 established a public bath- and wash-house. This city is the dirtiest in England, but has more varieties of baths than any other. The charges are from nothing and one cent up to a dollar.

In London more than 200,000 baths were taken in one year in one bath-house. The London baths have three features: (1) Private baths; (2) swimming baths; (3) and public wash-houses. Laundries, equipped with the best washing, drying, and ironing machines, have been combined with these baths. They are intended for the use of poor women. At these laundries two cents is charged for the first hour, three cents for the second, and four cents an hour for a longer time. The object in augmenting the charge is to exclude professional laundresses. In British towns, public baths have been regarded as a semi-philanthropic institution. They are public, but not free, and as a rule have been self-supporting. The most complete bath-houses in England are at Marybone. They comprise four swimming and one hundred private baths, a wash-house, and laundry for the accommodation of seventy-four women. A club-room is adapted for the use of the public-school children. Like many other bath-houses in England, the bath can be floored over and converted into a public gymnasium during the winter months. The charges are six and two cents. This last provides soap and towels. A swimming tank of 44,000 barrels is provided for women. There are twenty-one first-class private baths, and forty-eight second class. The public laundry comprises wash-house, drying-rooms, and mangling-rooms. The wash-house has two tubs, hot and cold water, pails, and scrubbing boards. The clothes can be dried in three minutes. The ironing-room has mangles, tables, and drying horse. All this can be obtained at the rate of three cents an hour. As the swimming tanks are emptied every night, sanitary conditions are observed.

It is not for the well-to-do but for the poor that we need these facilities. They should be available at all seasons and nearly all hours, and should be near the people. Many small baths have proved more beneficial than large establishments. Brighton has cottage baths in plain buildings simply arranged in the crowded tenement districts of the town. By placing baths at the very doors of the poor, and lowering charges, the object for which the baths exist is advanced. In Vienna the municipal baths are self-supporting. They have the Centralbad for those who can pay, and Volksbad where for two cents one can obtain a towel, soap, and forty liters of warm water, administered as a shower bath. The shower bath has been generally conceded to be the most satisfactory form for free and cheap public institutions. It cleanses, and at the same time economizes time, space, and water. In Europe this kind of bath is permitted in military barracks, factories, and schools. Under a rain of water, two hundred and eighty children can bathe in one hour, using one eighth as much water as with the bath-tub. France and Belgium are noted for their management of public bath-houses.

The first public-school bath in Germany was opened in 1883. It proved a great success. Except during the open bathing time of the summer months, by

far the greater portion of the children went unwashed except for face and hands. No compulsion was used, and only a few children bathed, but after two months seventy-five per cent. took part in the bathing. Each pupil who desires, receives a bath once a fortnight. The class which bathes, studies some lesson which does not require the whole class. From six to seven children go down at once. They step under douches ; the time occupied is small, and a class of fifty boys bathes in fifty minutes. Girls and young children take longer. The janitor and janitress who superintend the bathing state that pride induces the parents to dress their children better, and underclothes are mended and clean.

More than forty cities, among them Berlin, Munich, and Cologne, have placed baths in all new schoolhouses.

The development of the workingmen's bath has been rapid in Germany. As early as 1850, the question was agitated. In 1873 the firm of Krupp erected a bath-house at its steel works. Prior to 1896 more than two hundred workingmen's baths had been established in Germany.

The average cost of a warm shower bath has been found to be one fourth of a cent. Of the great importance of these baths in promoting hygienic conditions, it is hardly necessary to speak.

As a nation the United States is not fully alive to the demand of personal cleanliness. Frequently among the poorer classes of tenement buildings all the families on one floor are supplied with water by a single faucet. The extreme density of the population in many districts makes bathing imperative. There is not only a demand for places where people who have no chances at home for bathing can go, but where women can carry their clothes and do their family washing in a properly equipped laundry, instead of under difficulties in a tenement house. Massachusetts provides by statute for the erection of public baths.

Brooklyn has the honor of erecting the first municipal swimming-pool open the year round. It is near the high school, to enable the pupils to use the baths for recreation and swimming. This was erected at a cost of forty thousand dollars, is supplied with eighteen private baths, a swimming-tank eighty by twenty-six feet, and space for a gymnasium. The annual maintenance is five thousand dollars. New York City had the first public bath-house in the United States, open the year round for a hot or a cold water bath ; but the city, thinking the success problematic, allowed a private individual to donate the money. In 1849 the Public Bathing and Washing Association was incorporated. This continued two years, and in 1891 the People's Baths were opened by the Association for Improving the Condition of the Poor. Sixteen thousand baths were taken in this bath-house in one hundred and fifteen days. The bath in Center Market Place has twenty-seven sprays and three tubs; the fee is five cents, entitling bathers to two towels, soap, and the use of a compartment for twenty minutes. The Baron Hirsch Fund and Riverside Association also operate spray baths on the same plan.

When the Municipal Baths were planned, provision was made for the care of babies while their mothers took a bath or washed. The report of the People's Baths shows that 65,517 men and 12,800 women took baths in one year. A large per cent. of this difference between men and women is due to the fact that it is almost impossible for a tenement-house mother to take a bath away from home unless provision is made for her babies.

The proposal to introduce spray baths into a Boston public school came up in 1896. The idea was abandoned, but the

order to provide bathing accommodations in the Paul Revere schoolhouse passed by a vote of eleven to eight. In New York rooms have been planned to be left for bathing purposes in some of the new schoolhouses.

There are indications that all our large cities have begun to realize the necessity of these baths, and small establishments have already been built.

In 1896 a public natatorium was opened in Chicago. It is a building containing two swimming-tanks, one for men and one for women. The water is warmed. There are one hundred and eighty-six dressing-rooms. Bathers are requested to take a shower bath before entering the swimming-tanks.

In 1897 ground was broken in Philadelphia for the public baths. Half of the basement was planned to be fitted up as a laundry, where women could wash and the towels used in bathing be also cleaned. These towels are thrown down a chute into a disinfecting tank. Allowing twenty minutes to each bather, nine hundred baths can be taken in a day. It was planned to give shower-baths, and five cents was fixed as the price for a bath, soap, and towel. The bather enters a dressing-room, then through a swinging door an inner compartment, where the shower supplied with hot and cold water is located. The floor slopes inward, and drains into a gutter running along the back of the bath. One person in the office can overlook the waiting-room, take in money, and give out towels and soap to customers.

To sum up, it is the opinion of investigators both at home and abroad, and has been recommended —

That the spray or rain-water system is the best, as there is no waste of water, the cost of erection small, and cleanliness easily obtained.

That bath-houses at a moderate cost should be erected in the vicinity of those requiring them.

That bath-houses should contain proper and requisite division for the use of the cleanly and those not clean, and some system of fumigating clothes.

That public schools can be equipped with baths in basements at a small outlay.

That in tenement districts public wash-houses could be opened in connection with the baths, thereby relieving many homes of unhealthy conditions.

That a part of each bath should be free, in order that the poor may be helped.

MY LITTLE WHITE FRIEND.

BY ALICE MACGOWAN.

ONE summer I had such a pretty white friend,
Such a timid, small friend, but he came at my call,
As I lay with my book or the sheet I had penned,
Half awake, half asleep, on the gray meadow wall.

But I missed him one morn; he was gone from his place,
And his mother was crying; I heard her all day,
As I stared, with my hat pulled far over my face,
At the green sunny slopes where my friend used to play.

"Sure," I said, "some fierce beast must have slain him at night,"
And with wrath and with pity my bosom was filled,
And when I went asking, it proved I was right,
For my friend was a lamb that the butcher had killed.

EXERCISE FOR HEART DISEASE.

UNDER the general term "heart disease" is included a variety of maladies, differing very considerably in character. In general it may be said that there are two classes of heart diseases,— those due to organic changes in the organ, and those due to purely functional disturbance.

The most common form of organic heart disease is injury of one or more of the valves of the heart, as a result, generally, of rheumatic inflammation of its lining membrane. This valvular injury may be of such a character as to lessen the efficiency of the heart through the leakage of the valves, so that it is in the condition of a leaky pump; or greatly to increase its work by partial obstruction of the valve, so that it is like a pump working against an abnormal pressure through the obstruction of the outlet pipe. Both of these conditions may be combined. Fatty degeneration of the heart and changes in its arteries whereby the nutrition of the organ is impaired, are other forms of organic disease.

In organic affections, in which the heart is compelled to do an unusual amount of work, nature endeavors to adapt herself to the situation by increasing the strength of the organ, by increasing its size through development of its muscular walls, just as the biceps or any other muscle of the body is made to grow and increase in size and strength as the result of vigorous exercise. This enlargement is termed hypertrophy of the heart. Under certain circumstances, however, the walls of the heart are stretched instead of being strengthened, so that the enlargement is due, not to the thickening or strengthening of its walls, but to the dilatation of the cavities of the heart with thinning and consequent weakening of its muscular walls.

These opposite conditions, hypertrophy and dilatation, have a very important relation to exercise, and must be carefully considered. Hypertrophy of the heart exists not only in persons suffering from disease of the valves of the organ, but is a frequent result of overtraining, especially running, rowing, and excessive exertion in bicycle riding and other violent exercises. Both dilatation and hypertrophy of the heart are also found in cases of disease of the lungs, in which a considerable portion of the respiratory area is cut off by consolidation or destruc-

tion of lung tissue, thus diminishing the outlet of the blood from the right side of the heart. It will readily be seen that the effect of this must be the same as the partial obstruction of the valve.

Fatty degeneration of the heart is most frequently met with in persons suffering from obesity; it also occurs as the result of a long-continued high temperature in fevers, and as the result of the action of certain mineral poisons, and also certain organic poisons sometimes produced in the body by microbes. Overloading of the heart with fat is a condition constantly present in very fleshy persons, and one which is closely allied to fatty degeneration, but much more curable. Changes in the blood-vessels of the heart are chiefly met in old age. The same hardening and degeneration of the arteries which occur in other parts of the body also attack the vessels of the heart, giving rise to crises of pain and other grave symptoms.

In functional disorders of the heart there is simply disturbed action. These disturbances may be of several kinds: The heart's action may be either too rapid, too slow, or irregular. The irregularity may be manifested in a variety of ways. The normal rate of heart-beat in a person who is quiet is about seventy-two. When the heart-rate is regularly less than sixty in a person in a sitting position, it is too slow. If the rate is more than eighty when the heart is not excited by exercise, it is too rapid. In several cases encountered by the writer, the slow heart-beat has been found to be apparent but not real. Great slowness of the heart is a much more serious indication than rapid action of the organ.

Too rapid action of the heart is generally due to some reflex disturbance. Its most frequent causes are indigestion, prolapse of the stomach, floating kidney, and other disturbances of the abdominal organs whereby the heart is excited to excessive action through irritation of the sympathetic nerves.

Intermittent or irregular action of the heart, palpitation, and delirium, or completely disordered heart action, are other forms of functional disturbance of this organ.

The popular idea that heart disease is a malady which is necessarily and speedily fatal is an exceedingly mischievous one. This mistaken notion has given rise to the belief that persons suffering from heart disease must avoid exercise altogether, and as a result, many cases which might be improved by proper exercise are made worse by idleness. As the heart is one of the organs most immediately and naturally concerned in exercise, it is important that in diseases of this organ there should be close supervision over the muscular work of the patient. There is no condition of the body in which exercise is of greater value, when properly and systematically employed, and certainly no disease in which improper exercise, or exercise under improper circumstances, is productive of greater injury.

For practical purposes in relation to exercise, all forms of heart disease may be divided into the following classes:—

1. *Overaction of the heart,* due to overcompensation from valvular disease, to disease of the lungs in which the respiratory field is lessened, or to hypertrophy, the result of overtraining. Excessive action of the heart is indicated by its heavy beating (not palpitation, but excessive force of beat), strong, full, and sustained pulse, and congestion of the head, often accompanied by insomnia.

In cases of excessive overaction of the heart, exercise is contraindicated. Absolute rest in bed is necessary in many of these cases, sometimes for several weeks. Passive exercise may be administered with great advantage. Abdominal massage, moderate breathing exercises, and centrif-

ugal friction of the limbs should be administered, but no active exercise of any sort should be allowed. After the heart's action has become quiet, gentle exercises may be begun. The first exercises should be taken in bed, and should consist of arm and leg raising and resistive movements. The amount of exercise should be increased from day to day, care being taken continually to avoid exercising to such a degree as to excite the heart. The pulse-rate will, of course, be somewhat accelerated by exercise of any kind, but it should become quiet within ten or fifteen minutes after the exercise is suspended. Any exercise which causes a marked acceleration of the pulse, continuing for more than half an hour after the exercise is finished, can not be safely continued. Many weeks are sometimes required to enable a patient of this class to take ordinary exercise upon the feet without exciting the heart. Baths of all sorts, suitable applications of electricity, careful regulation of the dietary, and other measures are, of course, essential in these cases as a means of relieving the causes of the disease. This is also true of all other forms of cardiac disease.

2. *Weakness of the heart,* a condition resulting from dilatation from advanced valvular disease, from fatty degeneration, from hemorrhage, or from long-existing and exhausting disease, as a prolonged attack of fever accompanied by high temperature. Heart weakness may be recognized by the feeble, frequent pulse, easily extinguished by pressure with the finger; by the bluish, or cyanotic, appearance of the face or lips; and by the inability of the patient to exercise to any extent without quickly getting out of breath.

Exercise affords the only means by which the heart can be strengthened, and is, on this account, a most important measure of treatment. Simple rest in bed will only occasion increased weakness of the heart. The heart develops in conjunction with the other muscular structures of the body, and whatever will occasion a weakness of other muscles will also give rise to weakness of the heart, and the reverse. Nevertheless, it is of the highest importance that exercise should be administered with the greatest care in cases of heart weakness, for the reason that overwork of the heart increases its weakness, and in certain forms of the disease even slight overexertion may prove fatal through sudden failure of the organ. In a case in which the pulse-rate of only twenty-four per minute was observed, the patient could not live in an upright position. The moment he assumed the upright position upon his feet, he fell headlong to the floor. Some weeks elapsed before he was able to assume the upright position without becoming immediately unconscious. In such a case as this, the patient is constantly in imminent danger of death, hence great care should be taken to avoid exercises which overtax the heart, while at the same time the amount of exercise should be sufficient to give the heart enough work to induce nature to build up a strong muscular structure in the organ.

The sign of overtaxation of the heart is breathlessness. If it is observed that the exercise employed gives rise to shortness of breath which does not quickly subside, and especially if from day to day the breathlessness increases, or continues for a greater length of time, the special form of exercise employed must be discontinued, or must be lessened in amount. It should also be noted whether the frequency of the pulse-rate increases from day to day, or whether the pulse becomes less frequent and stronger. If the latter, the exercise is proving beneficial; if the former, injury is resulting.

In case of extreme weakness of the heart, the exercise must be begun with

passive exercises administered with the patient in bed. This form of exercise is, of course, specially adapted to patients in whom the heart weakness is so great that the patient is confined to his bed. In extreme cases, no exercise whatever should be administered at first, but massage should be employed in such a way as to encourage the circulation. Abdominal massage, and all other forms of massage except centrifugal, or downward, friction, may be employed with advantage. This serves to stimulate the activity of the heart and to lessen its work by dilating the blood-vessels. Joint movements and resistive exercises must at first be given with great care.

A patient suffering from cardiac insufficiency, as is the case with other patients for whom the "rest-cure" is employed, can not be cured in bed. The purpose of rest in bed is to restore the balance of the circulation. When this has been accomplished, as indicated by improved aëration of the blood, outwardly manifested by the disappearance of the blue color of the lips or skin, and of edema of the face or extremities, or of dropsical accumulations in the abdomen and chest or the pericardial sac, the patient may begin to take exercise upon his feet.

The exercise must not be carried so far, however, as to cause an increase of the dropsical accumulation in the feet or abdomen. Great care must be taken to see that the patient does not take such violent or long-continued exercise as to cause breathlessness, or even a decided increase in the rate of breathing. When this precaution is disregarded, the breathlessness will increase from day to day, even though the exercise be not increased, and the patient's former condition will gradually return, necessitating his again being put to bed, and the same measures employed as at first.

Walking and other voluntary exercises should be stopped short of a decided increase of respiratory activity, so that the heart shall not be to any degree excited. The greatest care will be required at the beginning of exercise to avoid going beyond the safe limit.

Passive, active-passive, and voluntary exercise of the joints, with the patient in a horizontal position, should be employed for half an hour after each effort of the patient to become accustomed to exercise in a vertical position, and will be found a very excellent means of quieting the heart. Among the most useful exercises in which the patient may at first engage, is the use of the treadle, which has the motion of the velocipede without the incitement to overexercise which accompanies the use of this admirable means of exercise.

By degrees the patient must be accustomed to more and more active exercises, until after a time he will be able to climb a hill of moderate grade or a flight of stairs with easy steps. The management of these cases is a matter of very great responsibility, and requires the closest supervision on the part of the trainer or the physician.

3. *Irregular action of the heart*, such as palpitation and intermittent or irregular beating. These troubles are, in the great majority of cases, connected with disturbances of digestion. In general, the same observations which have been made with reference to exercise for heart weakness apply with equal force to those functional disorders of the heart indicated by irregular action, palpitation, intermission, etc. One of the most common forms of irregular action of the heart is the alternate rapid and slow beating observed in tobacco users. In this, as in all other forms of heart disease, it is necessary that the cause of the disease be removed. The direct cause of irregular action of the heart is doubtless due to disturbance of the sympathetic nerve. Since irregular

action of the heart is due in the great majority of cases to irritation of the sympathetic nerve from prolapse of the stomach, kidney, liver, or other abdominal organs, it is evidently important that this cause also should be removed by the replacement of the organs and their retention in position by a proper abdominal bandage.

Care should be taken in the employment of exercise in this class of cases to note whether the exercise advised increases or diminishes the irregularity observed. It is very desirable, when possible, to obtain a tracing of the pulse before the patient begins his day's exercise; then take another tracing after he exercises. A comparison of these tracings, and of the tracings obtained from day to day, will give more exact information concerning his condition and progress than can be obtained by the finger alone.

In certain cases, exercise suited to the patient's condition will cause an almost complete disappearance of the irregularity. Occasionally cases are encountered in which the irregularity appears only when the patient is lying down, and disappears as soon as he rises to his feet or engages in any voluntary exercise. In cases of this sort, great care must be taken to avoid excessive exercise, even though the irregularity does disappear, for the reason that the reaction following the exercise may result in so great a cardiac weakness as to occasion fatal heart failure. The most hopeful cases are those in which the irregularity disappears or diminishes with rest, being aggravated by exercise. In these cases systematic and carefully graduated training of the heart will usually overcome the difficulty, although occasionally the irregularity will be permanent. This is especially true in cases in which the irregularity is rhythmical in character. In all cases of cardiac disease, such exercises as give rise to thoracic strain, or which necessitate holding the breath, such as lifting, jumping, and violent and strained bending movements, must be carefully avoided. This rule is imperative.

The bicycle is an excellent form of exercise for persons suffering from heart disease, providing it is used judiciously. Persons who have previously been accustomed to riding, so that the arduous task of learning may be avoided, may take gentle exercise upon the bicycle with advantage even before strong enough to walk a considerable distance. Care must be taken, however, to ride only on level surfaces so that exertion sufficient to produce hurried breathing will not be required. The slow leg movements executed when riding at a moderate rate will have a tendency to quiet an overactive heart, and the gentle exercise involved proves beneficial to the weak heart, hence the bicycle may be, under suitable conditions, employed in both forms of cardiac disease.

J. H. KELLOGG, M. D.

FOOT-WEAR.

EVER since man walked forth out of Eden into the brier-patch of the world, the question of foot-wear has been an important one; and because it has never yet been settled just right, the tribe of Mephibosheth has increased with every generation.

In this day any man or woman of fifty years who walks with the free, elastic grace of nature is so rare as to attract the admiring gaze of a street full of people; and it is, without question, true that very much of the physical distress that has drawn lines of suffering on many a fair and noble face has been caused directly by the prevalent styles in foot-wear, and the changes to which the feet have been frequently compelled to adapt themselves.

It is highly probable that few of us

have ever seen a foot that is just as it was first intended to be. There was a point that was not far off from the pathetic in the "Trilby" craze. The heart of society was touched by the possibilities of comfort that were suggested by that soft shoe, so easily slipped off and on, and the artistic sense that, for once, really made the foot so much more than the shoe, that it must needs be preserved in its original beauty and supple grace at all hazards.

Many a weary belle, who had in spite of all the efforts of her faithful chiropodist begun to feel the twinges of her first "corn," and the chills and heats with which the abused foot was mildly protesting against "French" shoes, has lingered over that foolish novel with a longing to be just as foot-free as was its redoubtable heroine; and has moaned because this most natural and chaste desire could not be gratified without such violence to fashion as could not for a moment be tolerated.

Much of the restlessness, the fretfulness, and even the exasperating recklessness of the children from babyhood up is caused by discomfort, if not by actual suffering, from illy fitting shoes; for, of course, if the foot, especially of the girl-baby, is likely to be too large, it must not be given too much room in which to spread itself. It makes a better shape to crowd it a wee bit at the sides, and let it lengthen instead of widen; and as for the child, oh, probably it is not the most comfortable thing in the world to wear shoes, but of course you can't let her go barefoot, *quite*.

O, for the barefoot days that were the joy of childhood in the generations that will never come again! And yet they were not wholly without trouble, for there were the stone-bruises, the thorns and slivers, and stubbings, and the fear of snakes!

It is clearly necessary that we wear shoes; and this gives an importance to the question of soles and uppers which can not be ignored in this revival of everything hygienic.

It would be worse than useless to ask that the world should go back, at one leap, to the moccasin style, for although it knows in its soul that a thousand ills would be escaped thereby, it will not do it. So the only thing left us is to see what can be done with the shoe to make it unchangeable, fashionable, and perfectly comfortable.

First of all, let society take up the question, discuss it on its merits, and decide that the foot *is* really more than the shoe, and a graceful carriage the one thing to be attained. Let the premium of popular favor be placed upon the strong, elastic step, which can never be taken in a shoe that does not leave every muscle absolutely free; let the fact be emphasized that a foot to be beautiful must be *large* in proportion to the dimensions of the body, not *small;* let the idea of *smallness* be frozen out of the discussion. All that the necessities of invalidism and its treatment have done for the chest and waist of the women of our day, the growing love of athletics should do for the feet of our young women; and this it would certainly do if the tide of popular thought and candid discussion should but turn in that channel.

Some inducement should be extended to lead inventive minds to go to work to produce a shoe modeled after the most scientific principles; and, meanwhile, those who long for deliverance should assert themselves and break the tyrannical combine of fashion and the "trade."

A shoe to be safe should be wider than the foot, and not long enough to catch on to things,—the edge of a step, for instance.

The common idea is that a certain proportion must be maintained, or the shoe

will not look trim and stylish. If you *must* have a certain width, you must take a certain length, whether your foot calls for and can reach out to it or not. If it is too long, you can stuff the toe with cotton,— a most unhygienic practise.

Resort has been made to all manner of styles in "toes," in order to give the width which is being demanded by suffering feet, as well as the length which the proportions require, and yet secure the diminutive appearance which must be preserved at all hazards.

O, the widths, the heights, the thicknesses, that have been snugly tucked away under dainty ruffled and silken skirts, while the tiny tips of patent toes peeped out, every one of which was a ridiculous fraud, a pitiful comment on the frivolous character of the fashionable world!

Why not be womanly once for all, and done with it? Why not take what has fallen to one's lot in the apportionment of flesh and bones, and make the most of it for every holy service; and from the hat upon the head to the shoe upon the foot give nature her due, and compel the world of fashion and of commerce to bow to her comfort, health, and grace?

But the shoe should be taken out of commerce at least as effectually as the dress, unless it can be made as easily adjustable upon purchase,— fitted while you wait. The shoemaker should be invited to return from the oblivion to which he was so long ago banished by the spirit of manufacture, and given his proper place in the domestic corps. Feet should be measured and fitted by the individual instead of the pair; and the little ones should grow up to the sole as the exigencies of travel require, never being compelled to settle their tender little pink feet upon boards until such support is required for actual protection from the roughness of the way.

S. M. I. Henry.

WHAT TO DO IN MIDSUMMER EMERGENCIES.

Sunstroke.— One of the most serious and frequent of midsummer emergencies is "sunstroke." It might better be termed "heat-stroke," since it may occur in the night or in any place where the heat is excessive. A "muggy" day with a comparatively low temperature is more injurious than a dry, hot atmosphere.

Sunstroke indicates an interference with that part of the nervous system which controls heat production and heat dissipation by the body, especially the latter, the result being that an insufficient amount of heat is given off by the body, and there is a marked increase in the body temperature.

Anything that causes a lowered vitality predisposes to sunstroke. Hence persons addicted to the use of alcohol are very frequent victims. The ingestion of large quantities of iced drinks predisposes to sunstroke. Constipation of the bowels is also a predisposing factor. Poisons absorbed from the contents of sluggish bowels lower the vitality of the whole body and interfere with the perfect action of the heat-regulating centers. A person in perfect health can endure very high temperatures with little danger. It is only when the living machinery is doing imperfect work that sunstroke is possible.

A diet of fresh fruit and grains is the very best in summer. Nature very kindly furnishes us with an abundance at this season of the year.

A sunstroke is generally preceded several days before by feelings of ill health,— loss of appetite, indigestion, constipation, scanty perspiration, and indisposition to active exercise. The stopping of perspiration is an ominous sign.

When a person falls with sunstroke, he may complain of pain in the head or over

the heart. The skin is hot and dry, temperature very high,— 106° to 108° F.,— with disturbances of respiration and pulse, nausea and vomiting, insensibility and stupor, weakness, or even complete paralysis.

The patient should be removed at once to a cool, shady place, his clothing loosened, ice applied to the head and spine, and cold water douches given; a cold bath can be used, also cold enemas. A very simple and effective treatment is the shower pack, which is administered as follows: An ordinary mattress is covered with oilcloth, upon which the patient is placed, wrapped in a sheet, and sprinkled with cold water as often as the sheet dries by evaporation. Ice may be applied to the head at the same time.

The patient may die in a few hours, or in mild cases completely recover in a few days, or he may have a long, tedious convalescence more or less imperfect, with tendencies to headache, weakness, inability to work in the sun, and other nervous symptoms, of a physical and psychical nature, which remain permanently.

To avoid sunstroke, see that the general health is good. Discard alcoholics and all narcotics, use iced drinks sparingly, especially when warm, keep the bowels active, and use an abundance of fresh fruit. A cold sponge bath in the morning, adding a little salt to the water, followed by a vigorous rubbing, is a simple and valuable stimulus to the healthy action of the skin.

The treatment for sunstroke is *cold* applications, and practically nothing but cold.

Snake Bites.—Venomous snakes are fortunately more rare in the United States than in some of the tropical countries. Naturalists have discovered about twenty-seven species of poisonous reptiles and one poisonous lizard in this country. Eighteen species are rattlesnakes, and the others are copperheads and vipers. The poisonous lizard is found in Texas, and is known as the "Gila Monster." The venom is contained in a little sac, its duct leading to a fang.

The poison in all reptiles is similar in character, and produces practically the same symptoms when injected into man. The results of bites vary only in proportion to the amount of virus that reaches the circulation. In many cases of snake bite the skin is not penetrated sufficiently to inject the poison into the circulation, or the poison may be absorbed by the clothing. By overlooking these facts many substances have erroneously been credited as antidotes to the venom. Especially is this true of alcohol. There is no true antidote for serpent bites known. The venom is a most active, deadly poison.

The symptoms produced are pain, great swelling and discoloration of the part, weak heart, fainting, labored respiration, nausea, vomiting. In cases where a large amount of virus is quickly thrown into the circulation, death may follow in a few hours. To be effectual, the treatment should be immediate. If the bite is on the arm or leg, no time should be lost in tying a bandage of some sort tightly around the limb above the wound. A rope, shoe-string, handkerchief, belt, or anything at hand should be used. It should be tied tightly, so that circulation in the limb is completely stopped. This prevents the absorption of the poison into the general circulation. After this, thoroughly cauterize the wound with a hot iron, or excise the wounded part freely. If there are no cracks or wounds in the lips, the wound may be sucked with impunity, for the poison is harmless in the stomach. The bandage around the arm or leg may be loosened a few minutes at a time, thus allowing the virus slow access to the general circulation.

The custom of using large quantities of whisky is not warranted by facts. Hot bottles to the spine and stomach, hot-water drinking, massage to the legs and arms, and cool applications to the head are all useful.

Fainting.—Though not necessarily confined to summer, fainting is probably more frequent then than at other seasons of the year. Fainting is caused by a sudden failure of the heart. Thus the brain has an insufficient amount of blood,—things turn dark, the patient falls to the ground, and is limp and unconscious. The face is pale.

Fear, joy, unpleasant sights, loss of blood, or pain may cause fainting. In fainting, a person is very near death; however, death rarely ensues. Nature suggests a remedy in having the patient fall. About the only thing to do is not to do the very thing that four out of five persons always do in a case of fainting; namely, raise the patient. It is perfectly permissible to raise the patient, provided you keep the feet higher than the head. It is dangerous to stand a fainting person upon his feet; far better stand him on his head; at least raise the feet higher than the head. No pillow should be used for the head. The clothing around the neck should be loosened; a dash of cold water thrown in the face will cause a gasp for breath, and the spell is over. The patient should keep the reclining position for some time after he becomes conscious.

Ordinarily in a few minutes the patient will be all right if nothing more is done than to allow him to lie perfectly horizontal. If in a crowd, the people should be made to stand back, thus allowing plenty of fresh air. The patient should be removed to a quiet place as soon as possible. Hot drinks, and hot and cold applications to the spine are valuable if there is a tendency for the attack to recur.

By keeping in mind the fact that fainting is very rarely fatal, all unnecessary excitement and apprehension may be avoided. W. B. HOLDEN, M. D.

HYGIENE OF THE EYE.

THE eye is a most delicately constructed miniature photographer's camera. It is a vitalized, automatic camera, self-focusing, self-loading, self-printing, and adjusted by the most complicated mechanism. The retina is the dry plate upon which are focused the varying images of daily life by the cornea and the crystalline lens. The iris and the ciliary bodies form the diaphragm; the eyelids act as a drop-shutter; the large chamber back of the lens is the camera proper; and the choroid coat forms the black draping which makes this chamber the dark-room.

In Infancy.— The eye of the new-born is hypermetropic, or far-sighted, which probably accounts for the fact that the young child reaches out for distant objects as if they were near. For the first few days of life the infant can see nothing definitely, and the eye is very sensitive to light. All know the dazzling effect of light after they have been in the dark for some time. To the new-born, light is painful, for the eye is not accustomed to it. This fact emphasizes the necessity of protecting the eyes of an infant from the direct rays of a bright light. At this period of life the eye may be permanently injured by carelessness in this matter. As soon as a child is born, the eyes should be washed with a piece of lint dipped in a solution of boracic acid. The hands should also be washed at once, to avoid infecting the eye. Neglect of this has cost many an infant the loss of an eye.

In Childhood. — During this period, and while in school, the eyes need to be carefully guarded from overwork and

abuse. More than thirty per cent. of school children have defective eyes, due to bad positions, improper light, overstudy, bad food, and malnutrition. In studying, the feet should be on the floor or on a stool, the body straight, and the head erect. Stooping over work interferes with the return circulation through the jugular veins, thus damming up the blood in the eyes, orbits, and brain, producing congestion of these parts.

The light should fall over the shoulder, upon the work or printed page and never come from in front of the reader. The type should be large, broad faced, the ink black, and the paper or book held at a proper distance from the eye.

Myopia, or near-sightedness, is developed during youth and young adult life, and is very much increased by continuance at near work. This may often be avoided by temperance in the use of the eye, and by avoiding straining the vision. A child should not do a full amount of school work soon after having had measles, scarlet fever, diphtheria, or any other exhausting acute disease. Good food, fresh air, outdoor exercise, and an active skin are all conducive to good vision. A child that has defective eyesight should have it corrected at once.

In Adult Life and Old Age.— During this period there is a gradual weakening of the accommodative powers of the eye, and so presbyopia, or vision of old age, is developed. If one has been far-sighted, this failure of accommodation can only be corrected by glasses, while the myope may see better, at least for a time.

Injuries to the Eye.— A cinder, a grain of sand, dirt, or any foreign body in the eye causes intense pain. Under such circumstances the eye should not be rubbed, but if it is rubbed, the movement should be toward the inner corner. A foreign particle may often be removed by keeping the eye closed for a few minutes, and then pulling the lid away from the eyeball. The abundance of the secretion will wash the irritating particle away. Throwing the head back and washing the eye with boracic acid is another efficient means. If this does not give relief, have the patient sit in a chair with his head thrown back on some support. Let the assistant stand behind the patient, and have him look down. Then with the right hand pull down on the upper lid and away from the eyeball, at the same time pressing on the lid with a pencil, a toothpick, or the end of the finger. In this way the lid can be folded back upon itself and the particle on the lid or eyeball exposed. It can now easily be removed with the corner of a handkerchief. The lower lid can be exposed by simply pulling down on the skin below it.

Lime, mortar, acids, or hot fluids in the eye should be attended to at once. Wash the eye with warm water, and drop in a few drops of olive-oil as a soothing application. Lime can be neutralized by washing the eye with water and vinegar, one teaspoonful of vinegar to two tablespoonfuls of water. Acids can be neutralized by washing with soda and water, one teaspoonful of soda to half a glass of water. After any such injury the eye should not be used, and should be treated with cold compresses or hot applications, cold being best at first.

At times a fragment of iron, steel, or brass may become lodged in the cornea, and can only be removed with a spud. This condition may be so painful as to require the instillation of a few drops of a weak solution of cocain into the eye. A bruise due to a blow or a flying stick should first be treated with cold compresses and later with hot applications.

Diseases of the Eye.— Many of these are of such a nature as to require the attention of a specialist. Simple inflammation of the conjunctiva, or a "blood-

shot" eye may be treated as follows: Wash the eye with a boracic acid solution, fifteen grains to the ounce, every two hours. Apply cold compresses or a rubber bag filled with ice-water fifteen minutes at a time, and repeat every two hours.

Often on awaking in the morning there is a secretion on the edge of the lid. This should not be rubbed off, but instead, the lids should be bathed with warm water, and this should be repeated at bedtime.

Defective conditions of the refractive and the accommodative function of the eye are a frequent cause of headache, often of the most aggravated type. Very frequently headache above the eyes, in the temple, or at the back of the head may be the only symptom of an ocular defect. These defects of the eye are often due to sickness or defective nutrition. Long continuance of these visual troubles may cause insomnia, nausea, dizziness, and even general failure of health.

When the sight becomes hazy, the letters blurring and running together, or when they become irregular and the eyes tire easily, the lids becoming heavy, and one becomes sleepy as soon as he begins to read; when the eyes burn, smart, and itch, accompanied by watering of the eye and a feeling as if sand were under the lid, an oculist should be consulted at once, and the eyes thoroughly examined. It is always economy to have the eyes very carefully tested. Do not buy glasses or spectacles of pedlers.

The foregoing symptoms, however, may be relieved very much by resting the eyes at intervals, by bathing them frequently with very hot water; by dashing cold water into the eye, applying cold compresses for a few minutes, and by taking more sleep.

When the white of the eye becomes yellow and dingy, and the eye has lost its luster and brilliancy, there is a physiological condition of actual "dirt in the eye." This indicates that not only the eye, but the entire body, is yellow and dingy within, and needs thorough cleansing and renovating. This may be accomplished by carefulness in diet, exercise, copious water drinking, and such baths as will increase the activity of the skin.

Effects of Tobacco and Alcohol on the Eye.— Those desiring to retain good eyesight should avoid these poisons. Tobacco has a decided effect upon the sight, and weakness of the eyes is often due to its use. Tobacco may produce total blindness, color blindness, and marked congestion, which in time leads to disease of the optic nerve, producing blindness beyond recovery. Alcoholic poisoning has a profound effect upon the eye, and the vision is impaired.

Things to Avoid.— 1. Avoid reading in a dark room, in the dusk of evening, or by a poor light.

2. Avoid reading with the light in front of you, but rather have the light fall over the shoulder. A lamp should be shaded.

3. Avoid dazzling lights and sudden changes in extremes in light, and never use the eyes when light is painful to the sight.

4. Avoid reading during sickness, and after measles, scarlet fever, and any exhausting disease.

5. Avoid reading while lying down. This is an unnatural position, straining the eye and producing congestion.

6. Avoid reading, at least for any length of time, on a moving train or when riding in a carriage, for the constant jar changes the focus of the eye, necessitating the constant action of the ciliary muscles in accommodation.

7. Avoid prolonged use of the eyes for near or fine work; rest the eye frequently by looking at objects at a distance.

8. Avoid reading in a stooped position, for this interferes with the return circulation, and congests the eye and the brain.

9. Avoid rubbing the eyes with the hand or with a rough cloth, but rather bathe them in cold water twice a day.

10. Do not persist in using the eyes when everything appears hazy and the letters blur, but obtain suitable glasses.

F. M. ROSSITER, M. D.

THE MIDSUMMER MENU.

SIMPLICITY of diet should be a matter of chief consideration at all seasons, but particularly so during the hot days of midsummer, when, to aid in keeping cool, the digestive organs should be taxed as little as possible, as likewise the strength and patience of the cook. The hours spent in an almost broiling heat in a hot kitchen, over a cook-stove, preparing rich, unwholesome, and time-taking dishes of all sorts, is conducive neither to the health of the one who cooks nor to that of the one who eats.

To keep comfortably cool is a prominent desire with most people at this season, but it may not have occurred to many that there exists a relation between the discomfort they experience and the food they eat.

The several purposes of food are to promote growth, to supply force, to produce heat, and to furnish material to repair the waste which is constantly taking place in the body. Upon thought, it will be evident that if the food supply be such as to keep the vital fires glowing fiercely within while the same rays beat down with intensity without, one will be, as the old saying is, "between two fires," and his suffering will be proportionate to the heat produced by each.

It follows to reason, then, that while the bill of fare should contain a proper proportion of all the different food elements, an excess of fats and sweets, which are especially heat producers, should be avoided, particularly in the form of rich pastries, cakes, and confections, which have the additional objection of being difficult of digestion. Stimulating drinks and foods of every kind, including tea, coffee, flesh-foods, gravies, sauces, and dishes highly seasoned with pepper and other strong condiments which inflame the blood and fan the vital fires, should likewise be discarded from the menu in hot weather; and in their stead may well be substituted a simple fare after nature's own plan, of seeds, nuts, and fruits.

The lavish wealth of fruits and succulent foods which the advent of summer brings, should be taken as a health hint from nature, of the important place these were designed to fill in the summer dietary. Though possessing but little nutritive value, their abundant juices and wholesome acids cool and cleanse the system, and when served with food with which they combine well in point of digestibility, they are a food *par excellence* for hot-weather use. Fruits do not affiliate well with flesh-foods, milk, and milk products, and often give rise to digestive disturbances when partaken of together, but these latter are not for several reasons the most desirable hot-weather foods, and it were better that they be excluded from the menu in midsummer. They are foods that spoil very quickly at this season, requiring special conditions and care to keep them fresh and sweet even for a short period. The jeopardy to health from their use when not fresh being so great, the conditions for their proper care so frequently being unattainable in homes of moderate means, and the liability that proper attention will be neglected by careless cooks and servants in well-to-do families, it is far wiser to substitute other foods of similar nutritive value, less liable to be served in an unwholesome condition.

The dietetic value of these foods consists chiefly in the fat and proteid material

which they supply to the system. These two necessary food elements may be supplied in quantity quite as well, and in quality far more healthful, in nuts and the cereal foods, which, when supplemented by a plentiful use of fruits, form an ideal dietary for the hot season.

Nuts and cereals are now manufactured into so many delicious, palatable, and pleasing foods that one can arrange a bill of fare for a hot day, both appetizing and nutritious and with — what will be appreciated as a boon by most housewives — almost no cooking. The menus given in this number are suggestive of what may be done in this line.

With such breads as granose biscuits, wafers, rolls, sticks, and zwieback as a foundation upon which to build, an almost unlimited variety of dainty and healthful dishes may be prepared in connection with fresh and stewed fruits and succulent vegetables. Wafers toasted just a moment on each side under a gas jet or in an oven to render them crisp, then spread with almond butter or nuttolene, may be filled with any preferred filling for sandwiches; hot browned granose biscuit make the most desirable toast on which to serve asparagus, spinach, poached egg, omelets, corn pulp, and eggplant; no better accompaniment for soups and salads can be found than nut sticks, while the possibilities of zwieback — simply made hot and crisp by five minutes in the oven, to be used dry as bread, with butter, or eaten with malted nuts, or softened slightly to be used with fruit dressing as a toast, or with fresh fruits as a shortcake or sandwich, or as a dumpling with vegetables and stews — are almost limitless. The keeping qualities of these breads is such that even if prepared at home, — as sticks, rolls, and zwieback may be if preferred, — it is not necessary to make them as often as is required for softer kinds of bread, and they can be made in quantity on days when cooking is comfortable work, and if stored in a dry place, will keep in good condition a month or longer. If becoming too dry, they may be freshened by dipping each separately in cold water, placing on tins, and rebaking for a few minutes in the oven. Prepared from whole-wheat flours, they are pre-eminently nutritious foods, easily digested, and always convenient for use.

ELLA EATON KELLOGG.

RECIPES.

Fruit Granola.— For this use the freshly extracted or canned juice of raspberries, currants, grapes, or cherries. Heat a quart of the juice to boiling, sprinkle in sufficient granola to thicken (about one pint will be needed), cook for two or three minutes, and serve hot with or without nut cream.

Minced Protose.— Chop the protose fine with a meat chopper or with a chopping knife. Have some strained stewed tomato heated to boiling, add one cup of the minced protose to one and one-half cups of the tomato. Boil up once and serve on slices of zwieback which have been softened with hot cream, hot nut cream, or hot water.

Eggs in Tomato Cases.—Take perfect-shaped, rather large-sized, fresh tomatoes. Cut a portion off the stem end, and scoop out the seed, leaving the outer portion of the fruit intact. Break an egg into this prepared case, sprinkle lightly with salt, and bake in the oven until the whites are well set, but not hardened. Serve with a border of nicely browned granose flakes.

Granola with Nut Meal.— Into a quart of boiling water sprinkle a pint of granola and two tablespoonfuls of nut meal. Cook for two or three minutes, then add a cupful of nicely steamed

Seasonable Menus

BREAKFAST NO. 1.

Fresh Fruit
Fruit Granola
Minced Protose on Toast
Browned Granose Biscuit
with Nuttolene
Fruit-Coco

BREAKFAST NO. 2.

Fresh Fruit
Gran Nuts with Blackberry Sauce
Eggs in Tomato Cases
with Granose Borders
Fruit Sandwiches
Zwieback with Malted Nuts

By Mrs.
E. E. KELLOGG

DINNER NO. 1.

Clear Tomato Soup
with Nut Sticks
Broiled Nuttolene Fruit Salad
Corn Baked with Zwieback
Fruit Dessert
Wafers with Fresh Berries

DINNER NO. 2.

Corn Purée with Croutons
Wafer Sandwiches Broiled Tomato
Granola with Nut Meal
Browned Granose Biscuit with
Nut Butter
Fresh Blackberries
Peaches Fruit-Coco

raisins, and serve hot with fruit or fruit-juices.

Fruit Dessert.— Stewed cherries, currants, or raspberries are the best for this dessert, but any tart fruit, sweetened to taste, may be used. Rub the fruit to a pulp through a colander, taking care to have plenty of juice. Heat to boiling. Place a layer of slices of zwieback on the bottom of a rather deep square pan; the small pieces and broken bits of zwieback may be utilized for this, if carefully placed. Turn over the zwieback a generous quantity of the boiling fruit pulp, enough to soften it well, then cover with a thick dusting of dry fruit-coco. Add another layer of zwieback, over which turn more of the hot fruit, and add another dusting of fruit-coco. Finish with a third layer of zwieback and more hot fruit pulp. Place a similar sized pan on the top of the dessert, weighted to press it firmly, and place on ice for one hour. Serve in slices with or without nut cream.

Broiled Tomatoes.— Choose perfectly ripened but firm tomatoes of equal size. Place them on a wire broiler, and broil over glowing coals, from three to eight minutes according to size, then turn and cook on the other side. Broil the stem end first. Serve hot with salt to season and a little nut cream.

Corn Baked with Zwieback.— Rub a tablespoonful of nut butter smooth in a little cold water, adding more gradually until it makes one quart in all. Heat this to boiling, and with it moisten eight or ten slices of zwieback. Put one pint of freshly cooked or canned corn through a colander to remove the skins, add to it one-half teaspoonful of salt, and one cup of water with which has been mingled one teaspoonful of nut butter. Cover the bottom of a graniteware baking dish with the corn mixture, and place therein a layer of zwieback slices, pour a little more of the corn over these slices, and add another layer of the zwieback; continue in

this way till the dish is full, pouring the corn mixture over each layer. Bake twenty minutes in a rather hot oven and serve at once.

SUMMER SALADS.

To be successful in the preparation of salads one must realize that the most dainty salad is ruined by allowing it to be served in a careless manner. The value of a salad depends upon the value of the ingredients and the skill used in their preparation.

Care should be used to combine only such foods as harmonize. Salads can be prepared from vegetables, fruits, and nuts.

Most salads are more acceptable if garnished. Several varieties of lettuce, celery leaves, sprigs of parsley, nasturtium leaves, slices of tomato or lemon, may be used for this purpose. They should always be served cold.

There are three styles of dishes in which salads may be served; namely, a flaring (vegetable) dish, a shallow grain bowl, and plates the same size as pie plates. A plate with a gilt edge and flowers is perhaps the most preferable and artistic of the three. Some salads may be served in small, flaring glasses.

Fruit salad may be served just before the dessert, while salads prepared from vegetables and nuts should be served between the soup and the vegetable course.

Such a salad as potato, beet, lemon, cottage cheese, apple, pineapple, and banana should be prepared stiff enough to hold its own weight.

Baked Banana Salad.— A variety of salads can be prepared from this very common fruit. Peel the banana, roll lightly in sugar, and place in a granite or porcelain pan, and bake in a moderate oven for twenty minutes. Dress with a sour fruit-juice thickened to the consistency of cream by adding a little corn-starch.

A lemon sauce — one cup of water, one tablespoonful of corn-starch, and the juice of one-half large lemon sweetened to taste — makes an excellent dressing.

Cut the baked banana in slices, and place in the center of the dish upon which a leaf of lettuce has been laid, and dress with the sauce.

Banana Salad No. 2.— Prepare as for the above, but serve whole on a plate with salad dressing over the center of the banana, leaving the ends exposed and resting on a small leaf of lettuce.

Pineapple Salad.— Carefully stir together one part of pineapple with eight parts sweet salad dressing. Serve on a garnish of lettuce leaves. Canned sliced pineapple and fresh pineapple are preferable to shredded pineapple. When canned pineapple is used, care should be taken to drain the juice thoroughly from the fruit.

Apple and Pineapple Salad.— Prepare as for pineapple, using one-half part of finely cut tart apples; as fast as they are cut they should be added to the salad dressing, to keep them from becoming dark. Apples should never be chopped, as this causes them to lose their color.

Apple Salad.—Prepare as for apple and pineapple, leaving out the pineapple.

Grapefruit Salad.— Shred the grapefruit, and dress with nut oil prepared by adding one part lemon-juice to two parts nut oil; serve in a deep dish.

Protose Mayonnaise.— Cut protose in small cubes, and add one part of mayonnaise dressing to five parts protose; serve on a garnish of green.

Salad in Surprise.— Carefully cut a slice from the top of a well-ripened tomato; remove the inner portion, and fill with any salad, replace the slice of tomato, and serve with a garnish.

Sunflower Mayonnaise.—Place on a large lettuce leaf a ring of cottage cheese, and in the center place a small quantity of

the cooked yolk of an egg which has been passed through a colander, then surround the cottage cheese with a ring of cooked nut-oil dressing.

Tomato Salad.— Dress cold sliced tomatoes with cooked nut-oil dressing.

Asparagus Salad.— Dress cooked asparagus tips with sour-salad dressing.

Savory Salad.— Force one-half pound of protose through a fine colander; add one pint strained tomato, one-half cup gluten, six teaspoonfuls of pulverized celery leaves, one and one-half teaspoonfuls salt, two tablespoonfuls lemon-juice, and one-third cup nut oil.

Ribbon Salad.—On a good-sized leaf of lettuce place a narrow layer of lemon cottage cheese;[1] beside this place the same quantity of tomato cottage cheese,[2] and on either side of these add a layer of mayonnaise dressing.

Baked Peanut Salad.— Serve cold baked peanuts on a garnish of lettuce; add a few drops of lemon-juice to each plate of salad.

Beet Mayonnaise.— Follow the directions for protose mayonnaise, using cold chopped beets instead of protose.

Fancy Beet Salad.— At a small expense tin cutters can be procured which will cut cold beets in the shape of stars, hearts, etc. On a large lettuce leaf place a small portion of mayonnaise dressing, and around the edges of this place the fancy cut beets. D. D. FITCH.

Sour Salad Dressing.— Rub two slightly rounded tablespoonfuls of peanut or almond butter smooth with two thirds of a cup of water (the half-pint cup sold in the house-furnishing stores) according to directions for preparing the nut butter for bread. Let this cream boil up for a moment over the fire. Remove from the stove, add one half a teaspoonful of salt and two tablespoonfuls of lemon-juice. Cool, and it is ready for use. If too thick, it may be thinned with a little lemon-juice or water. More salt and lemon-juice may be added if desired. By using a scant cup of strained stewed tomato in place of the water in the above, with the almond butter, we have another palatable and very pretty dressing.

Sweet Salad Dressing.— Rub two rounded tablespoonfuls of almond butter smooth with two thirds of a cup of water, add two tablespoonfuls of sugar, one fourth of a teaspoonful of salt; cook as for sour dressing, and add two tablespoonfuls of lemon-juice. When a yellow color is desired with either the sweet or the sour dressing, have the beaten yolk of an egg in a bowl, and just as you remove the dressing from the fire, pour it over the egg, a little at a time, stirring well at first. When the egg is used, a little less water and more lemon-juice may be required.

The dressing is especially palatable on finely sliced apples; apples and celery; apples and very ripe bananas; strawberries and bananas, or pineapple and orange. If the dressing is put on as soon as the fruit is sliced, it will not turn dark.

The sour dressing of either nut or almond butter may be used whenever a sour dressing is desired; but the nut butter is richer with "chicken salad" or over sliced apples, flavored with the oil of, or a very little minced, onion. This apple and onion salad is, by many, liked best of all. EVORA BUCKNUM.

[1] Cottage cheese made by curdling sweet milk with lemon-juice.

[2] Lemon cottage cheese colored with tomato-juice.

HOW TO GIVE RUBS.

THE oil rub is given to lubricate the skin, and as a protection against taking cold. In applying the oil, first begin with the hand, and with long strokes go over the arm and around the shoulder three times. Second, beginning with the

hand, give a long stroke to the shoulder, coming down with a light, rolling movement, and repeat three times. Then dividing the arm into two sections, go over the external surface twice, giving light percussion, then turn the arm and treat the other section in the same way, ending with percussion to the hand. Give three long, soothing, downward strokes from the shoulder to the finger-tips. In applying the lubricant, give the same movements to the lower extremities as to the arm.

From foot to knee treat in the same manner as the arm, paying special attention to the knee-joints ; from knee to hip repeat the same movements, dividing into two sections and alternating above and below three times. Give percussion in the same manner as to the arm. Finish with three long strokes from hips to toes.

In applying the lubricant to the chest, begin by rubbing lightly once over the whole surface of the chest, the shoulders, the sides, and the abdomen ; then beginning at the neck, give light, circular movements three times, going well down over the sides and hips. Have the patient take and retain a deep inhalation while light percussion is given. Finish with three light, soothing strokes to the whole surface. Give the same movements to the back as to the chest, finishing with six long, soothing strokes to the spine. If this rub is given after a hot bath or treatment, omit the percussion. In hot weather it is usually more agreeable to use talcum powder than oil. A dry hand rub may be given for sedative effect. In this case use the same movements as in the oil rub, but doubling the number of each movement and omitting percussion.

A saline rub may be given for tonic effect. Have the patient lie upon a fresh, dry sheet, and keep the body well covered, except the part under treatment. Prepare two quarts of water at a temperature of from 65° to 80°, and dissolve in this one teacupful of salt. Apply this solution with the hand, following the plan outlined for the oil rub. Rub lightly and briskly until the skin is as dry as possible. Use a Turkish bath towel to finish drying. Finish with percussion.

A dry mustard rub is useful for stimulating capillary circulation. It is given in the same way as the oil rub, except that the movements should be a trifle heavier.

A solution of witch-hazel may be used for a rub designed to have a sedative effect. Use one-half pint of equal parts of witch-hazel and water at a temperature of 100°.

To cleanse the skin and to cool it by evaporation use a vinegar rub. Take one-half pint of equal parts of vinegar and water at a temperature of 80°.

For relieving irritation of the skin the alkaline rub is excellent. Dissolve one tablespoonful of soda in one-half pint of water at a temperature of 100°. Apply with light movements and omit percussion.

An alcohol rub has a slightly narcotic effect on the terminal nerves, and cools the skin and hardens it. Take two ounces of alcohol and two of water. Have the temperature 100°. Do not use a towel, but rub with the hands until thoroughly dry.

An alcohol and mustard rub has a stimulating effect. Take one ounce of alcohol, one of mustard, and one of water, at a temperature of 100°. Mix thoroughly and apply as in other rubs.

A dry shampoo may be given to stimulate the circulation ; with a dry shampoo brush go over the whole surface of the body with short, rapid strokes, dividing it into sections as in the oil rub.

ABBIE M. WINEGAR, M. D.

HOW THE BLOOD FEEDS THE TISSUES.

THE various cells of the body, before they can receive any benefit from the food which has entered the blood by absorption from the alimentary canal, must incorporate this food into their own structures. This process is called assimilation.

The cells do not receive their nourishment directly from the blood, for the food material which enters the blood first passes into the lymph, and from the lymph is taken up by the cells as they need it. The lymph has much the same composition as the blood, with the exception that it does not contain red blood-cells, and the proportion of proteid material is somewhat less than that contained in the blood. The lymph bathes all the tissues of the body, and in some structures which possess no blood-vessels is the only medium from which food can be obtained. The cornea and the lens of the eye are examples of such structures.

The lymph is frequently termed the "middle man" between the cells and the blood. Besides being a medium through which food material passes from the blood to the cells, it also acts as a medium through which the effete and poisonous materials resulting from cell activity are carried to the blood and then eliminated from the body by means of the lungs, kidneys, skin, etc.; it thus acts as a medium of exchange. In order that the various tissues of the body may do their work properly, it is necessary that they be constantly bathed with lymph. It might properly be said that the body works under water; the brain and spinal cord are surrounded by and contain a fluid; all mucous and serous surfaces, such as the alimentary canal, the pleura of the lungs, the pericardium, are abundantly supplied with fluid. These different fluids facilitate the movements of the various organs in which such movements are necessary to the proper performance of their functions.

Pure food, when properly combined, prepared, and digested, is readily absorbed, and as a result, the blood and lymph are pure and the cells easily assimilate the food material. This they store up for the purpose of supplying the deficiency caused by activity and to furnish them with energy with which to do further work.

The ability of the body to perform work depends largely upon the amount of energy stored in the cells, and the amount of energy depends almost entirely on the character of the food which is set before them for their assimilation in the blood and lymph.

Assimilation is taking place all the time, but most extensively while the body is resting, as during sleep. In the evening the system is usually tired from the work performed during the day, and nature very kindly suggests a rest in the form of sleep, so that new energy may be stored up for the proper performance of the next day's labor. If the system is robbed of this necessary rest, the work done under such conditions will be more or less imperfect.

Some interesting experiments have been conducted with the brains of sparrows to show that the brain cells store up energy during rest. In these experiments it has been demonstrated by means of the microscope that the brain cells of a sparrow which has been flying about all day and is tired, contain very few granules, and are somewhat shrunken in size, while cells taken from the brain of a sparrow in the early morning, before it has had an opportunity to exercise and use up its energy, are large, plump, and darker than the former. This difference is due to the very great number of gran-

ules which have accumulated during the resting period. The same is true of the other cells of the body. The cells which furnish the secretions with which to digest food material must have time to rest in order that they may accumulate a sufficient amount of energy to carry on their work. The accompanying illustration shows the appearance of cells found in the pancreas during the periods of rest and activity. During the period of rest the cells can

devote themselves entirely to the reception and the storing of energy granules; this is not the case, however, during the working period, for at this time the cells have another function in that they have to think and act for us. When we wish to walk, our wills say to a certain group of muscles, "Contract and relax," and the result is movement; so it is with the brain cells during the working period. These delicate cells are constantly busy, and have very little time to build up.

From these few facts will be seen the necessity of a sufficient amount of rest to enable one to perform satisfactory work. On the other hand, work is equally as necessary. The two go together, and either without the other soon works ruin.

CHARLES E. STEWART, M. D.

THE ROAD FROM LIFE TO DEATH.

THE velocity with which men travel down grade toward ill health and death is largely regulated by themselves. Each one has it within his power to a certain extent to issue his own schedule as to what stations he will pass through. Fortunately, nature is so kind to us that at each station she furnishes a switch road, whose curve and length are more or less tedious, by which we can return to the starting-place from which we ought never to have departed.

We may name one of the stations "Business Pressure." It is a point that the average business man soon reaches in his journey on this road. It has several distinct features, such as Mental Worry, Sedentary Habits, and Five-Minute Meals at Popular Restaurants. These are all closely connected by rapid transit lines.

At this station one often spends sleepless nights in trying to devise some means to keep out of the grasp of the trusts, and yet maintain an honest living in spite of unnatural competition. He is likely trying to eat quantities of material called food, but which, from a physiological standpoint, must be considered "wood, hay, and stubble."

Perhaps the next station down the line is "Wretched Sanitation." Prominent points of interest at this station are "Backyards" that sadly need attention, "Improper Ventilation," by which heaven's invigorating air is shut out of sleeping-rooms, kitchens, and parlors, to say nothing of factories, stores, and schools. At this station the cellars lack inspection, and germs are allowed to thrive in pantries and under refrigerators, as well as in the bottom of wood boxes. All these things have a share in the responsibility for the condition of the traveler while staying in that vicinity.

It is only a short distance downward on this road before we reach the station which is so largely responsible for the rapid deterioration of the human race, "Unnatural Demands of Modern So-

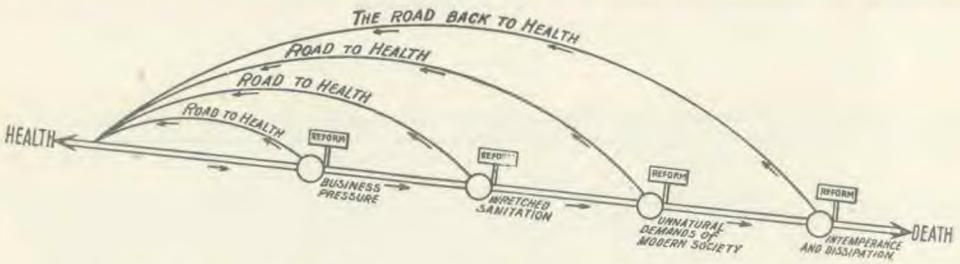
ciety." The popular points in this place that all visit more or less frequently are "Late Hours," "Midnight Dinners," "Unhygienic Banquets," "Unnatural Excitements of the Theater," "The Dance" and its accompaniments, and last, but not least, "Fashionable Dress."

Many an individual only too sadly realizes before he has become thoroughly familiar with all of these that he is approaching the terminal station on this through line.

Another station which is practically in sight of the last we may call "Intemperance and Dissipation." Those who have stayed a long time at the previous point will have nearly used up their "stop-over" privilege, and consequently will not have so long a time to tarry here; nevertheless, on account of its great importance and prominence on this route, it deserves more than passing notice. The most striking features of this place are "Erroneous Diet," "Cigars and Other Forms of Tobacco," "Liquor," and various forms of "Immorality."

Thousands who have traveled over this road and gone through each of these stations have scarcely noticed that at each of them there is a switch road leading away from the main line and eventually back toward the starting-point. This may be because there seems to be nothing especially striking or attractive about this switch road. It has a very ordinary looking sign-board, upon which is written in plain letters without the least show of flourish the word "Reform."

It is true that as station after station is passed on this downward road to Death, the curve of the "Reform" return line



becomes longer and longer and more marked, so that it requires more and more perseverance and faith on the part of those who choose to take it actually to believe that by traveling upon it they may return to the haven of health from which they ought never to have strayed.

DAVID PAULSON, M. D.

HOME CLUB QUESTIONS.

PHYSICAL DEVELOPMENT.

1. What is hypertrophy of the heart?
2. What is the respiratory area?
3. What is a cyanotic appearance of the skin?
4. What is edema?
5. Define "thoracic."

SCIENTIFIC COOKERY.

1. What are the purposes of food?
2. Are all the different food elements essential to a perfect diet at all seasons?
3. What foods are best fitted for a hot-weather dietary, and why?
4. Why are flesh-foods, milk, etc., undesirable hot-weather foods?

HYDROTHERAPY.

1. When should oil be used in giving rubs?
2. When may powder be substituted?
3. What is the difference in effect between a saline and a witch-hazel rub?
4. What kind of rub should be given to stop sweating?
5. How may irritation of the skin be relieved?

PHYSIOLOGY AND HYGIENE.

1. What is assimilation ?

2. How do the cells receive their nourishment ?

3. Why is the lymph called the middleman ?

4. Why is sleep a necessity ?

ANSWERS TO HOME CLUB QUESTIONS FOR JULY.

PHYSICAL DEVELOPMENT.

1. HARDENING and contraction of the arteries.

2. It causes a shrinkage of all the organs and parts.

3. Taking moderate and systematic exercise and regulating the diet.

4. He should continue it until the least effort causes excessive fatigue.

5. By the condition of the arteries.

HEALTHFUL DRESS.

1. They are practically the same.

2. Because those most active in dress reform have neglected this feature.

3. Degenerate bodies and false standards of beauty.

4. Nature, propriety, comfort.

5. The constant change and uncertainty in public taste.

SCIENTIFIC COOKERY.

1. Water.

2. No. The dried beans and peas contain several times as much nitrogenous material as do the green ones.

3. In boiling water.

4. Lemon-juice, because it is a pure product of nature, not an artificial one, as is vinegar.

5. Freshness.

HYDROTHERAPY.

1. Stimulating and tonic to the entire body.

2. Usually the lower the better.

3. Because under the most favorable circumstances the amateur takes some risk in giving these treatments.

4. Because their reactionary effect is dangerous.

PHYSIOLOGY AND HYGIENE.

1. Diffusion of fluid through the membranes.

2. Small projections of the mucous membrane of the small intestine.

3. To absorb.

4. The subclavian vein extends from the outer margin of the first rib to the inner end of the junction of the collar-bone with the breast-bone.

5. The small intestine.

THE BLACK PLAGUE.

BY MRS. S. M. I. HENRY.

"MISS NANNIE, will you come and try on your dress ? This is the third time I have called you ! "

The child stopped the skipping-rope which she and Rover were jumping together, looked over her shoulder pouting, and stood for a moment ; then throwing the rope with angry impatience cried,—

"If I don't come, I s'pose you 'll *make* me."

"Indeed I shall ! What do you act this way for, and your poor brother dead in the house, and your mother just heart-broken, and the funeral in an hour, and your dress not done, and you jumping the rope like as if everybody was well and happy ? You deserve a good shaking, you bad child ! "

"But I don't want that black dress ; and I won't wear it, so there ! 'nless you put some red or yellow on it."

"Red or yellow ! — queer taste, I should say."

"I think you've got queer taste to want me to have a black dress, so there ! "

"Taste is one thing, and mourning's another," said Mrs. Hanna.

"Well, I don't want any mourning; I want to jump."

"Miss Nannie, I am astonished at you. You don't seem to care one little bit that poor Gordie is dead."

"That's all you know about it, Mrs. Hanna. I was just thinking about him as hard as I could jump, and wishing he'd come to life again, and run out and jump with me as he did most every day on his way to school. I'd rather have him than Rover any time. It'll be awful lonesome 'th out him," and the little mouth quivered.

"Well, then, act as though you cared, and come when you are called. Madame Neil is almost crazy with your hanging back. Your mother will expect you to be dressed suitable. She'll hold us responsible, and I won't be scolded for your badness any more to-day," and she reached out her hand to take hold of the child.

"If you touch me, I'll scream."

"Then I'll just put you in the closet."

"I'll scream louder 'n thunder, 'n shake the windows."

The nurse knew by experience just what this meant, and stood pale with anger before these signs of life in the demon that she was sure sometimes inhabited the breast of that eight-year-old girl.

Mrs. Hanna had gone as far as she could without danger, and since she dare not use force at this juncture of affairs, she must retreat and try persuasion; so she modulated her tones and chose her words to suit the occasion, and said,—

"Nannie, dear, come now, be a good girl, and I'll give you that long stick of peppermint."

"Will you, honest?"

"Indeed I will; but Madame Neil is in a great hurry."

"If it was anything but black ——"

"Well, if folks will die, what can you do, child? Do try to be reasonable."

"I don't see why I must have a black dress if Gordie did die. I can feel just as bad in my blue one, if I try hard."

"O Nannie, I am so tired!" and the woman began to cry from vexation and weariness.

The child really loved her, and could not endure this. It was very unusual; and springing forward, she said,—

"Don't cry, dear. I'll come. You go off, and I'll come by my own self. I'll take two or three more jumps, for, of course, I can't jump in black."

"What a notion," laughed Mrs. Hanna, wiping her tears and kissing the little face turned pitifully up to her. "You can jump in black just as well as you could in white."

"No, I can't. I know 'bout that. I will take a good-by jump with Rover, and hang up my rope."

"How do you suppose Rover jumps? He is always in black."

Nannie turned and looked at him in a way that made him spring up at her, waving his banner of a tail with delight.

"Well, I don't care," she said after a minute, "he is all black, and he's a dog. Mebby if I was a dog I'd have to be a white one. I feel 's if I would, anyhow. I know I couldn't jump in black. But we've had a good one, haven't we, Rover? so I'll go to Madame after just three more skips. You needn't wait. I always do as I say, don't I?"

"Yes, you do. You are a good child when you take a notion. Hurry up though, won't you, dear?"

"Yes, I'll hurry and run."

"But go still; don't make a noise in the hall, will you?"

"Why not?"

"It ain't proper when folks is dead, and we're getting ready for a funeral."

"O dear," and the child shook herself, "I don't see why. It's awful mixey. I wish I could run away 'til it all gets right again."

"But, Nannie, you said you'd go to Madame, and time *is* going fast."

"Yes, I will. Just as quick as you leave me alone I'll begin to get ready to go. I *must* have three more jumps."

"You are a queer young 'ne," said Mrs. Hanna, "but I know you'll do it, so I'll go and get myself ready. You'll find Madame Neil in the nursery dressing-room," and with a sigh of relief Mrs. Hanna turned toward the house.

Nannie took her three skips, and winding the rope about her lithe little body, she ran to the side entrance, where she was met by a solemn man in black, with a quantity of cloth of the same color on his arm. Instantly the brightness faded from her face, her steps halted, then slowed, her whole manner changed, and from thence it was a very demure little figure that, with a black dog at its heels, stole noiselessly on up to the nursery dressing-room.

"Well, Miss Nannie, you have taken your time, I should say," was Madame's greeting.

"Yes'm, I had to. But I'm here now."

"And none too soon, I tell you. What your mother will say if this dress is n't right, I don't know, and no time left to change it, and nobody to blame but you."

"Yes, there is."

"Who? I should like to know."

"The dark man who made black. I met him, and he's awful. I don't want it. I had to take another jump first, 'cause I — I — I ca — n't bear it; so there!" and a pitiful little wail broke through the trembling lips as the dark folds of the mourning dress fell about her. That first outcry settled into bitter sobbing, while great tears chased each other down the cheeks from which the warm rosy bloom had blanched to the color of ashes.

In the midst of it the door opened, and a sad-faced, nervous little lady in heavy crape entered. At sight of the weeping child about whom the black dress was being fastened, her own face grew paler, and her red eyes filled.

"My darling child!" she cried, and kneeling, folded her in her arms. "We shall miss brother. We can't bear it, can we?"

"N-o-o, I can't, unless you'll let me take this old dress off, and give me my pearly one that Gordie liked best. I know he'd rather I'd wear that at his funeral. I can stand it then, mama, and be happy again!"

"Happy with brother dead? Mama can't be happy ever again, never."

"Can't you? — never?"

"O no; how can I? How can you? Just think of him dead in his coffin, and in a little while to be put in the ground. But I suppose you are only a child, you can't understand; but you'll grow to it.

"You see, Madame Neil, this is only the beginning for her of what comes to us all. I know just how she feels. I thought it would kill me to put on my first black dress. It was my widow's dress, three months before she was born. It fell over me like a black cloud, and I never got out from under it, and, of course, never shall now. But, in a way, I like the black now, and did then. I could n't enjoy anything else with my devoted husband in his grave, and yet I was glad when the year was up, and I could change to second-year mourning. Sometimes I've thought it a barbarism to put on black, but one must, of course."

"O yes, Madam, one must; and it is so becoming to you. I always thought you looked well in black."

"As to that," and Mrs. Haverly arose, "I should not choose it for beauty, any

more than I would choose sorrow for joy, or a funeral instead of a feast. I accept it as a necessary sign of an inevitable condition of relentless woe; and that is all."

"O mama!" It was another piercing wail. "Don't look so, mama. I wish I could die if you do."

"Well, I've wished that more times than I can tell, but we've got to live till our time comes, darling, and try to be just as happy as we can, of course."

"Well, then, mama, when the funeral is all over, we'll put on our other dresses, won't we?"

"O, no. Of course we'll have to wear our dresses for a year. Sometimes I feel that I am doomed to black for the rest of my life; but you will come out of it in time."

"O! goodie! and when I do I'll make you come, too; see if I don't. And I think I'll get Rover shaved, and have him made over into a white dog. I'll get a white shaggy coat to cover him all over, so we'll all be happy again. Do you hear, Rover? You look awful sorry, too. Would n't you like to dress in white? See, mama, how he looks."

"Yes, poor Rover, he is very proper, and very properly dressed."

Madame Neil and Mrs. Hanna had no end of trouble with the obstinate child to make her ready in time, and to get her in her place for the gruesome display that celebrated the death of the twelve-year-old son and brother.

For some reason, which caused intimate friends to wonder, Mrs. Haverly had insisted on such a funeral as had not been seen in many a year; in fact, a revival of the old-time monstrosity, with such depths of gloom as could with difficulty be manufactured in a day filled with the perfect glory of the summer time.

Her grief was deep, and as real as mother-love could make it, and as hopeless as the absence of genuine faith could leave it. Perverted views of life from childhood had led to distorted views of death, while an intense and uncontrolled nature demanded an exaggerated expression of every sentiment of sorrow. She was too refined and chaste to make a scene of her *self*, but since she must do something, she gave the cue that led to a funeral that was like a scene in some stage tragedy.

The decorators were pleased with the idea of a change from the prevailing styles, and since it was at the instance of a patron who would spare nothing to have her wish, they spared nothing that in their line could express the most intense grief. The house was darkened at midday by heavy black draperies, relieved only by masses of white flowers that, stripped of every hint of color, looked ghastly in the dim light from candles that were vainly trying to shine out from under black hoods.

The overabundance of flowers made the atmosphere heavy with sickening odors, which were to fragrance what the mournful strains from the concealed orchestra were to music.

Through this gloom stealthy forms glided with movements so unnatural, and out of them spake with tones so weird in their effort to be subdued, that as Nannie was led in, pale and shrinking, she was only restrained from flight by the fact that she was so cowed and bewildered as to have lost her usual power to protest or to act for herself.

The service was in keeping. Words that should have been made vehicles of truth and comfort were uttered in tones of such sepulchral depth and such artistic intensity as to rob them of all meaning. The fretted, hungry heart of the woman who mourned as one without hope was comforted only by the thought that she had given an expression to her grief such

as no one present had ever seen before, such as must lift her sorrow up into a place to which no other could approach, — it was the comfort which might result from a violent venting of an agony that was beyond relief. She took a species of delight in every gruesome detail of this exhibit of her inexpressible sorrow, the same kind of delight which screams may bring to pain, while the child at her side sat watching for she knew not what, with wide-open eyes that shone in the gloom out of her white face like lights from behind a mask. The face was too round for such pallor. so much so as to give it a grotesque appearance, in harmony with the masquerade of sorrow of which it was a part.

The child's emotions were, however, genuine. She had heretofore held her life almost in her own hands; for, left to the care of her nurse, she had early found out how to get whatever she really wanted, and nature strong within her had, as a rule, held sway. She loved freedom, and she reveled in light; the beauty of fields and woods and sea captivated her. She made friends with every living creature, and everything that grew. Her nurse shared in these preferences, and had never been unwilling to humor her in those likings that led her into Outdoor Land.

The small fraction of each day that had been spent with her mother had been agreeable enough, as a rule, to leave no very oppressive impressions, although she never was inclined to run after her, nor yet to linger in her society. She could not have told why. She only felt that those cold, nerveless hands and that hopeless face had nothing in them for her.

She and Gordon had been good friends, but he was her senior by years enough to take him away from her into the school world, until his sudden death had cut him off utterly, and filled all things about her with a gloom which she could neither understand nor endure.

The obsequies were long drawn out by an elaborate program of the most mournful and depressing music, which groaned and sobbed and wailed until at last the nature of the child asserted itself in another of those same wild cries that this time, coming in at just the right breath, and not a tone off from the notes of the high soprano, so expressed a genuine heart-break as nothing else could have done, that the entire company was thrilled.

If it had stopped there it would have been perfect, as the leader of the orchestra said more than once afterward, but it seems that nature is so vulgarly natural that she never can know just when to stop in order to produce the most "artistic effects," and a second cry, that was little short of a regular planing-mill screech, warned Mrs. Hanna that Nannie would better be removed from the scene.

She had been, however, by this time reduced to a condition so utterly unreasoning, for which no one understood her well enough to account, that after the first effort it was easy enough to see that she must be taken instead of led. Accordingly Mrs. Hanna lifted and carried her to the nursery, where, as she attempted to stand her on her feet, she fell over in a little, limp, black bundle.

"What is the matter of you, I should like to know?" exclaimed Mrs. Hanna.

There was no reply from the bundle

"Nannie!"

Not a sound: then she dropped down beside her, took hold of her in earnest, lifted and laid her over on her lap, and after one glance exclaimed,—

"Merciful goodness!" and the next minute was flying down the hall and stairway to the place where the old family physician was comfortably dozing in an easy chair just outside the drawing-room door. Mrs. Hanna gave him a most ungentle awakening, and startled those within hearing by whispering loudly,—

"Come quick! Nannie 's got a fit!'

(To be continued.)

PHYSICAL CULTURE IN INFANCY.

BY KATE LINDSAY, M. D.

A PERFECT, symmetrically formed body is very rare indeed, even among the comparatively young and healthy in the prime of life. Visit the ordinary public school, and notice the evidence of physical deformity among the little students of even the primary classes. Abnormally curved spines, round shoulders, contracted chests, bandy legs, indicate imperfect muscle development; walking intoed, limping and shuffling along instead of the free, easy, energetic step of youth, is an evidence that the legs and arms are of unequal length. In such a child no part of the badly arranged organs is placed in proper relation to the other parts. Perfect symmetry means simply the arrangement of every part of the body as to structure, form, position, etc., so as to maintain its proper relation toward all the other parts of the body.

As most physical deformities begin to manifest themselves very early in life, it is evident that the chief causes of these disorders of symmetry must exist at an early period. The most common causes are improper nutrition and deformities of the body caused by the cramping, restraining effect of ill-fitting dress, and the distorting results of bad positions. The little seven-pound body, about nineteen or twenty inches long, is soft and easily molded at birth. The bones are simply flexible cartilages, and so they can easily be bent in any way to suit the habitual position of the infant. Take the month-old baby and lay it on the table undressed, on its back, and it flexes its legs at the knees, and turns its feet in so that the soles will face each other, the knees being held a long ways apart. Now try to straighten the legs out and to bring the heels and knees together, resting the heels on the table, and you will find that it can not be done without raising the pelvis off the table and curving the lower spine unnaturally forward. Just at this time, when nature demands that no weight should rest upon the feet, and that the little one should be left to kick up its heels and play with its toes in peace, fashion says it must submit to the long, cumbersome infant's robes, with so many yards of depending drapery not only acting as a continuous leverage, pressing the feet and legs down and hampering all freedom of action, but also destroying the natural curves of the spine and the arch of the feet, besides tending to the formation of crooked toes, ingrowing toe-nails, and bunions. No wonder the little one is so happy when undressed and relieved from its bondage; it can rest its tired muscles by a change to the normal position.

The spine is a flexible pyramid made of twenty-six bones arranged one above another, with the base below and the apex above. It is flexible, and when fully developed has several curves, with the convexities directed either backward or forward, according to the location of the curves. At birth there are really none of the normal curves of later life. When the little one lies on its side, the weight of the head may slightly curve the neck forward, but the remainder of the spinal column forms one backward curve from the neck to the pelvis. When the little one is a few months older and begins to sit up, the normal curves begin to form by an increase of the inward curve of the neck, and also the formation of the lumbar curve at the lower end of the spine.

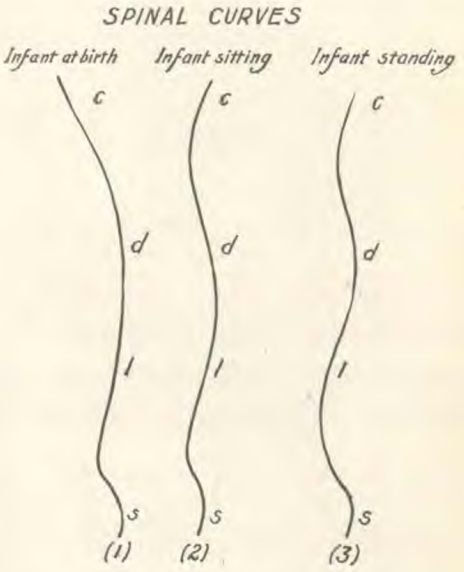
The little one should never be enticed to sit up until the spine has become strong enough to maintain the trunk of the body upright. At first it can do this for only a short time, when it becomes tired; and

if the little one has been left unrestrained and free from any fetters of either bands or pillow props, it will roll gently over on its side and enjoy itself with its own inventions; but if it is strapped up in a high-chair, cab, or is propped up with pillows so that it can not lie down, when the feeble spine becomes too tired to hold it up, it will fall forward over the obstruction, whatever it may be, in a most uncomfortable position. The writer has often seen a little one sleeping soundly in this distorted position.

Posterior spinal curvature from sitting too soon

The figures give a practical illustration of what marked spinal deformities may result from persisting in trying to make the baby sit up too soon. It is no doubt very handy for the mother or the nurse to tie the little one to its high-chair or bind it fast to its cab, or else surround it with pillows so that it can not change its position, but what can the poor little one do when its muscles and tired ligaments give way, if it can not lie down? — It must lean over in some direction from want of ability to hold itself up.

When the baby begins to stand upright and to walk, the natural curves of the spine are more markedly formed, and if it is left to itself without any prompting or urging to walk too soon, or being tied in a go-cart so that it can not lie or sit down when tired, it will walk only when natural instinct indicates that the muscles, ligaments, and spinal column are strong enough to keep the body erect for this form of locomotion. If forced to walk too soon, by being dragged along by one hand by some thoughtless older person, it will be likely to develop some form of unnatural flexion of the spine, which will forever after mar the form and lay the foundation for much subsequent ill health.



The restraining of normal bodily activity by improper clothing has been

already mentioned when speaking of the deforming influences of the weight of the infant's long robes on the feet and spine. Tight bands around the body also seriously interfere with the bodily development, and tend to displace and depress all the organs of the chest, pelvis, and abdomen by changing the form and diminishing the size of the containing cavities. It also causes many bony deformities, as unnatural curving of the ribs, lateral spinal curvature, and the like, which all contribute to want of symmetry.

As the infant's body is developing rapidly, trebling its weight in the first year of life, any tight band or other too small garment, unless it is carefully let out to meet the increasing demand for room, often causes serious deformity and permanent displacement of important vital organs. The binder and the many tight skirt bands of the infant wardrobes of the past are responsible for many dilated stomachs, displaced kidneys and livers of the present adult generation. How often does one see a finely formed foot, and how many adults are entirely free from corns, bunions, and ingrowing toe-nails? How many complain of suffering from weak ankles, sensitive soles, especially of the heels and toes.

What hideous deformities most civilized feet show! Yet a large percentage of these deformed extremities owe their want of symmetry to the heavy skirts and short, tight shoes of infancy. Mother or nurse goes to the shop to select the baby's shoes, and chooses a cunning pair that will fit snugly the cute little feet so that she may be able to tell the admiring friends that they are "too sweet for anything." If the shoes are extra nice, they are put on only for state occasions, and so may last for months, until they become somewhat worn, when, despite the fact that the developing foot has long since outgrown them, economy demands that now the suffering infant must wear them out by enduring the cruel pinching of its toes daily until they become all cramped and flexed under the foot, and the big-toe joint enlarges and inflames until a full-fledged bunion is developed. The ankles are made weak by the tight lacing of the boot around it, compressing the tender muscles, blood-vessels, and nerves, and interfering with the circulation and proper growth and nutrition of the foot and ankle. Just remove the shoe from the foot of such a little one where the flesh of the fat little leg is hanging over the boot top, and feel how cold and bloodless the foot is, and see how the tender flesh is compressed and wrinkled by the cruel pressure.

Often sleeves are worn after they have been outgrown, thus cruelly hindering the actions of the sensitive arms that keep up a perpetual motion when baby is awake. Tightly pinned, two thick diapers frequently overheat and weaken the structures of the pelvis, the bulk of the cloth padded between the extremities tending to cause deformities of the hips, at the same time preventing development of the legs, and hindering grace and symmetry of carriage. Much of the ambling gait one sees in adults comes from this cause and the distortions of the spine which always go with it.

A child should be trained to use its muscles, and walk as intended by nature. If freed from all restraining influences in infancy, it will, as soon as it begins to notice things which it wishes to grasp, make an effort to get to them. At first it may be able only to crawl or roll itself toward them; after a time it will begin to creep, then to stand, then to walk a few steps at a time. At this important time the place of the adult, be it father, mother, nurse, or some one else, is to keep the hands off, only using them to remove any hindrance to the child's locomotion. Tuck

up its skirts into a proper creeping apron, so that they will not get in the way of the feet, and let it have some place in which to exercise where there will be no danger either of injuring itself or of doing any damage to the furniture or bric-à-brac.

It may seem absurd to indicate to many parents, who expect to put their children into a gymnasium and give them a full course of physical training in their school life, that the greatest results may be derived from proper physical culture of the infant. It is in this plastic period that the form is most easily molded. To develop a symmetrical body in infancy, it must be well nourished. The bones, which are the framework of the body, must be built up with the proper building material to make them firm and strong; and this material must be organized, and contain the needed mineral elements, or the bones will remain soft and plastic

Rickets is a very common disorder among bottle fed and other badly nourished infants. Often one sees the bandy legs, pigeon-breasts, and abnormally enlarged head in the individual in after life, indicative of an attack of rickets in infancy. Such children are usually late in both teething and walking, and the fontanelles remain open a long time. Sometimes the infant is emaciated; in other cases he is fat, but the tissues are soft and flabby. In fact, these same children are often good, and will lie upon their backs for hours, and will not complain unless handled, all because their flesh is sore and they do not wish to be disturbed. For a suitable diet for such children the reader is referred to previous articles.

With a proper dietary the child should have proper physical culture and treatment. Take pains to see that it is not restrained in any way by its garments, and also that it does not lie too long in one position or in a wrong position. Keep it in the fresh air as much as possible, and give it twice daily a short cool bath, sprays or plunges, or even a sponge bath. Use tepid water at first; then cool or even cold water may be used, as the little one can endure it. Massage daily and electricity are also very beneficial in such cases. As the flesh of the infant is usually very sensitive, great care should be exercised to make the manipulations light at first, until with better nutrition the undue sensitiveness is overcome.

Thoughtless older people often lift children up by their hands, or as the writer has sometimes observed, even by one arm; in fact, the writer has known of dislocation of the shoulder-joint caused by this thoughtless handling. Often infants are cared for by nurse-girls who are only children themselves, and who carry their little charges so that the spine is not properly supported, and in this position the head bends forward and causes an unnatural flexion of the spine.

It is at this period of life that the weal or the woe of the infant's future is entirely in the hands of its parents. Then it has no will either to resist evil or to choose good habits of position or anything else, but sits, stands, or lies in the position chosen for it by others. If parents only had proper knowledge as to what food, dress, and other environments of early life caused the deformities of the body, and also were educated in the art of removing and avoiding these, they could save their children much suffering.

It is surely as important a matter to construct a human body as it is to manufacture a watch or any other piece of mechanism. Man can not put together the delicate, complex machinery of the human body, but by intelligent regulation of the environment of the young, the body may be placed in proper conditions for normal self-development. This is the knowledge every parent should seek to obtain.

Tesla on Old Age.

According to Nikola Tesla, between four thousand and seven thousand microbes settle on every square foot of the human body every twenty-four hours. He thinks the reason that old people are yellow and wrinkled is because the microbes have for years fed upon their skins, and recommends as the best way of combating old age a thorough washing of the skin once a day with alcohol. The *Trained Nurse* states that Tesla has invented a battery which shoots the microbes off into space with great violence, sometimes to a distance of four or five feet, and comments further: —

"We recommend the washing; almost any kind of washing will remove a few germs from the skin. But why throw the poor germs five feet out in the air? If they are just killed and washed off with alcohol, won't that do?"

Diagnosis by the Hand.

Dr. Edward Blake, of London, in a book on the study of the hand for indications of local and general disease, makes mention of the fact that on those rare occasions when the aid of the European physician is sought for a female member of any Mohammedan family of distinction, the only part of the patient which the doctor is permitted to see is the hand, which is thrust for that purpose through a small opening in a curtain. The object of Dr. Blake's paper, then, is to answer to the best of his ability the question as to whether it is possible that a fairly respectable diagnosis might be based upon a sight of the hand alone.

THE MAN WITH THE HOE.

BOWED by the weight of centuries, he leans
Upon his hoe and gazes on the ground,
The emptiness of ages in his face,
And on his back the burden of the world.
Who made him dead to rapture and despair,
A thing that grieves not and that never hopes,
Stolid and stunned, a brother to the ox?
Who loosened and let down his brutal jaw?
Whose was the hand that slanted back this brow?
Whose breath blew out the light within this brain?

Is this the thing the Lord God made and gave
To have dominion over sea and land;
To trace the stars and search the heavens for power;
To feel the passion of eternity?
Is this the dream He dreamed who shaped the suns
And pillared the blue firmament with light?
Down all the stretch of hell to its last gulf
There is no shape more terrible than this —
More tongued with censure of the world's blind greed,
More filled with signs and portents for the soul,
More fraught with menace to the universe.

What gulfs between him and the seraphim!
Slave of the wheel of labor, what to him
Are Plato and the swing of Pleiades?
What the long reaches of the peaks of song,
The rift of dawn, the reddening of the rose?
Through this dread shape the suffering ages look;
Time's tragedy is in that aching stoop;
Through this dread shape, humanity, betrayed,
Plundered, profaned, and disinherited,
Cries protest to the judges of the world,
A protest that is also prophecy.

O masters, lords, and rulers in all lands,
Is this the handiwork you give to God —
This monstrous thing distorted and soul-quenched?
How will you ever straighten up this shape;
Give back the upward looking and the light;
Rebuild in it the music and the dream;
Touch it again with immortality;
Make right the immemorial infamies,
Perfidious wrongs, immedicable woes?

O masters, lords, and rulers in all lands,
How will the future reckon with this man?
How answer his brute question in that hour
When whirlwinds of rebellion shake the world?
How will it be with kingdoms and with kings —
With those who shaped him to the thing he is —
When this dumb terror shall reply to God
After the silence of the centuries?

— *Edwin Markham.*

EDITORIAL.

TEA TIPPLING.

TEA drinking has come to be one of the gigantic evils of modern society. In this country alone twenty million dollars are expended every year in the purchase of this unwholesome drug; and the evil is growing at an alarming rate. Physicians attribute the enormous increase in the consumption of tea and coffee to the fact that we are becoming an exceedingly nervous people. We crave something to obtund the irritability of our nerves, and we take refuge in tea and coffee.

The fact that when a person drinks strong tea and coffee the sense of hunger is allayed, has given rise to the idea that tea and coffee are foods. Medical text-books and physiologies have for many years been teaching that tea and coffee, if not exactly foods, are to some extent substitutes for them. A thoroughgoing investigation, however, has shown the very opposite to be the case. It has been proved conclusively that tea and coffee are not foods in any sense whatever, and that they diminish the appetite for food simply by diminishing the ability to digest it.

There are many things besides tea and coffee that diminish the appetite for food. Many a man would rather have his pipe of tobacco or a cigar than his dinner. Heavy smokers scarcely know when the dinner-hour comes, except by the clock or by a weakness of the knees. Alcohol operates in the same way. The man who uses alcohol can always relieve his hunger by a toddy or a glass of whisky, particularly if he takes his whisky "straight," for the effect of alcohol as well as of tobacco is to diminish the power of the stomach to digest food.

Tea, coffee, cocoa, chocolate, and the cocoa bean,— all of these contain the same or closely allied elements: they are all intoxicating, and their exhilarating effects are equally as great as are the anesthetic effects of other drugs. The use of the cocoa leaf is very common in South America. When those addicted to it start off on a long journey, they take with them almost no food, but supply themselves with a little roll of cocoa leaves, which they chew constantly, claiming and really imagining that these take the place of food. But travelers in South America who have tested this theory contradict it. They say that the chronic cocoa eater can always be recognized by his appearance,— his hollow eyes, sunken cheeks, trembling hands, and tottering gait, his vacillating manner, and his evident mental depression. This is only an exaggerated picture of what we see in the chronic tea drinker.

We know that tea, coffee, and these kindred drugs are not foods, because a person can not live upon them. Any one who undertakes to work upon the strength of tea and coffee, and eats no other food, diminishes in weight about as rapidly as if he ate nothing at all. There is no food power and no real energizing power in either tea or coffee. They do not support the ability to work, but they do increase the disposition to work. The man who is tired or exhausted takes a cup of tea or coffee, a glass of whisky, a cup of chocolate or cocoa, or a small dose of cocain, and is relieved of his weariness. He feels greater ease in labor, but his muscles have not recuperated; no new energy has been put into them; he has simply lost his sense of weariness. Now this sensation of fatigue is a danger-signal, a beacon-light. If the light of the lighthouse is extinguished, the ships may run upon the rocks and be wrecked. So the man who, under the influence of a drug, is no longer conscious that he is going beyond the limits of safe exertion, may continue working harder than ever, but as a final result the exhaustion that he experiences exceeds that which attended his for-

mer efforts. When a man takes tea or coffee as others use alcohol, he has to put forth a greater effort, and greater exhaustion is experienced every time he repeats the use of the drug. This shows that these drugs waste energy, and that the waste of energy is greater at each effort — this is physiological.

The same is true in regard to alcohol. Dr. Parkes once hired two sets of men to dig a certain amount of earth; he gave one set alcohol, and the other none. Those who took alcohol worked with greater ease than the others, but at the end of two or three days they were exhausted; they were not able to dig as much earth as the others, and the more alcohol they had, the less work they could do, and the greater was their exhaustion.

These facts indicate that alcohol, tea, and coffee belong to the same class of stimulants. To emphasize this is of special importance, because it is a very singular fact that while it is generally recognized as true that the habit of alcohol drinking or using intoxicating liquors of any sort is injurious, there is an almost universal belief that tea and coffee are wholesome. I am satisfied that this favorable opinion with reference to these drugs is due to ignorance of their character.

Natural foods encourage digestion. One kind helps the digestion of another,— for example, the acids, the dextrin, the sugar, and the flavors of fruits serve to stimulate and call forth the gastric juice which is necessary for the digestion of the albumins, as of nuts; and the fats which the nuts contain are useful and necessary in stimulating the peristaltic activity whereby the food is moved along the alimentary canal, also encouraging the action of the liver. No wholesome food ever interferes with digestion, but carefully conducted experiments show beyond all cavil that the use of tea and coffee has a most pernicious effect upon digestion because of the injurious substances which they contain. Tea contains tannin; if you add a little iron to tea, it becomes black. No one would think of making tea in an iron teakettle; it would be as black as ink. If you take a strong cup of tea and stir it with an iron spoon, it soon becomes black; this is because of the combination of the tannin of the tea with iron, a combination that makes ink. Leather is made from soaking hides in a decoction of oak bark, which contains tannin. The tannic acid combines with the connective tissue of the hides or skins, and thus produces leather. So when a man eats a piece of beefsteak and drinks a strong cup of tea, the tannic acid of the tea combines with the connective tissue of the steak, and it is converted into leather. Certainly if one understands this, he can not imagine that tea would have a very favorable influence upon digestion. If one were to soak his beefsteak in a strong cup of tea for half an hour, he would find it as impossible to chew it as to chew sole-leather. So when a person eats beef and drinks tea, the leather-making process is started in his stomach.

But some writers say that tea and coffee are favorable to starch digestion; that while they hinder the digestion of the albuminoids, they somehow encourage that of starch. The common use of tea and toast may have led many people to hold this opinion. Certainly it is very generally considered a happy combination. But it is a very unhappy one, for the starch of the bread is rendered indigestible by the tannin of the tea, which paralyzes the salivary glands, thus hindering the production of saliva. The saliva digests the starch; without saliva starch could not digest, and tea, even in small quantities, paralyzes to some extent the salivary glands, — half a cup of tea will prevent the digestion of starch, so that when a person drinks half a cup of tea with his meal, he takes enough thein into his stomach to render the digestion of all starchy foods impossible.

There is a popular notion that whatever we find the great mass of the people doing must be right. Hence it has been remarked, even by physiologists, that the fact that so many people drink tea is evidence that there is a natural demand for it, and therefore it is proper to satisfy that demand. The same argument is advanced in favor of whisky and tobacco. Old Thomas Tryon wrote more than two hundred years ago, "He that follows the multitude has a knave for a master and a fool for a tutor."

The demand for tea and coffee is purely artificial; if it were a natural demand it would be universal, which it is not. Now the demand for food is absolutely universal. There is also a universal demand for air and water on the part of all living animals. But there is no universal demand for tea, coffee, alcohol, or tobacco, on the part of either men or animals. Monkeys do not demand tobacco,— unless they have been taught to use it, just as schoolboys have to be taught to use it. There is no natural demand for tobacco, because the boy who tries to use it repents of his folly many times. With all of us there is a natural hatred of tobacco and alcohol, and if we have not a hatred of tea and coffee also, it is because our natural tastes have been greatly sophisticated. You can hardly find a boy or girl who would drink tea or coffee were it not for the cream and sugar accompanying it. It is not until the natural taste has been vitiated that such things can be tolerated.

It seems to me that these facts are sufficient to convince us that tea is not a natural food. It is not a food at all; on the contrary, it is an antidigestant, a substance which absolutely annihilates digestion, or is capable of doing so if the quantity taken is large enough and strong enough. Not only is it true that tea and coffee contain no nourishment and seriously interfere with digestion, but it is true also that they are actual poisons. One proof of this is that they will kill animals. Distil tea or coffee by placing it in a dry retort, and a poison in it is crystallized in the form of needles; this poison can be separated from tea or coffee by various means. The amount of poisonous matter (thein) contained in tea is about six per cent., and in coffee about one per cent., the thein of tea and the caffein of coffee being the same thing. One eighth of a grain of caffein or thein will kill a frog; five grains will kill a rabbit; and seven and a half grains will kill a cat. There is more than an ounce of poison in a pound of tea, enough to kill seventy rabbits or fifty cats. It takes only about ten grains of thein to make a man sick. Professor Lehmann, a German physician, some years ago gave each of several men from eight to ten grains of thein, and they were so much affected by it that they were not able to do any work on the day of the experiment, nor yet on the next day; but, as I have stated, one single half ounce of ordinary tea contains from ten to sixteen grains of thein — of this very poison. It takes only two cups of "good, strong tea" to make some people more or less intoxicated.

The intoxicating effect of the use of tea is shown in various ways: Here are several people sitting around a table indulging in this beverage. After they have taken a few cups, notice how they begin to gossip about their neighbors, because self-control is diminished. Two hundred years ago, one of the kings of England prohibited tea taverns because, as he said, they threatened the peace and good order of his kingdom; people gathered there and drank tea until they became careless and talked treason. The influence of the drug on these drinkers was such as to diminish their moral sense and render them oblivious of consequences, and they lost their interest in the good of the commonwealth.

Another evidence that tea is poisonous is its individual influence upon the man or woman who drinks it. Many a person can not sleep at night if he takes a cup of tea in the afternoon.

Now the rule for making tea is one teaspoonful of tea for each cup, and one for the teapot. A teaspoonful of fine tea measures about a dram. This tea, we will suppose, contains three per cent. of thein, so that there would be about two grains of thein in that one cup of tea, and that is enough to keep a man awake all night.

The desire for sleep is one of the most overpowering impulses. But tea is a drug sufficiently powerful entirely to neutralize and overwhelm the natural instinct of the body. Opium has an equally strong but exactly opposite effect. Put a man under the influence of tea, and he can not sleep. Put him under the influence of opium, and it seems as if he were sleeping his last sleep,— his pulse is reduced, and his breathing is almost imperceptible. Give him now a few cups of strong tea, and it will antidote the effects of the poison of the drug which he

has previously taken. Tea is more powerful to keep him awake than opium was to put him to sleep.

There is another evidence that tea and coffee are poisons: If a person is tired, or in a state of anxiety or trouble, he feels relieved and comforted by a cup of tea. One is comforted in precisely the same way in which a user of alcohol is comforted by his dram; the drug simply drowns and benumbs the moral sensibilities.

Some time ago a woman in Minneapolis who had acquired the habit of tea drinking carried her mania so far that she had the teapot on the stove all the time, and drank thirty or forty cups a day. In consequence of this habit she was finally sent to the lunatic asylum. I knew a woman who had delirium tremens as a result of tea tippling. She drank no alcohol or intoxicating liquors, so called, of any sort. She had simply taken great quantities of strong tea. She was a tea-drunkard. A few years ago some servant girls in a tea factory in Boston were arrested on the charge of being drunk and disorderly. It was found that they had used no alcoholic liquors, but had chewed tea constantly; they had free access to the drug, and they carried it in their pockets, chewing it all the time, and as a result became intoxicated. The same thing is found to be the result of using tea-cigarettes. This practise originated in Paris, where so many evil things begin. The custom was imported to this country, and there is a society of ladies in New York who carry tea-cigarettes in little boxes made like card-cases with false backs, and in these false backs they conceal a supply of cigarettes. Not long ago, in London, there was a club of newspaper reporters who used to get together every Saturday night and have a spree on tea. They would sit up until midnight and after, drinking tea; they would drink and drink until they became insensible.

There is another poison in tea besides thein and tannin; it contains an aromatic property — an essential oil. Coffee contains the same essential oil, and this produces the excitement of the nerves which is the result of drinking tea. The Chinese have found out that new tea is more intoxicating than old, because it contains more of this volatile oil; the oil evaporates with age. It is the universal custom in China to allow tea to become a year old before it is used. The Chinese ladies have little cups about as big as a thimble, and they sip from these several times a day, but their tea is so weak that if it were served to you, you would say there was no tea about it. That sort of tea is comparatively harmless; there is not enough poison in it to produce any perceptible effect.

Dr. Bock, of Leipsic, calls attention to some of the peculiar effects of tea. He says that he has discovered that tea causes a man to be peevish and irritable; that while it gives temporary relief from weariness, nervousness, irritability, grief, and sorrow, nevertheless, the ultimate effect is to make a person more peevish, nervous, and irritable. It is a common thing for ladies to drink tea to relieve headache,— and it does relieve it temporarily, as opium does, but it comes back again the next day, and then tea must be taken again to cure that headache. I have been told by many ladies to whom I have prohibited tea, "Why, doctor, I can't endure life unless I have my tea." Now such a person is a tea-tippler, a tea-drunkard. Dr. Ehrlich, of England, says there are many tea-drunkards in that country. The stomachs of these tea-drinkers are paralyzed with the narcotic in the tea; and they can not eat because they can not digest food. They believe that tea is a substitute for food, and that it "keeps them up," but they are starving, nevertheless. Dr. Bock also noticed that tea drinking produces a peculiar kind of mania among women, the mania for acting the "persecuted saint." Another characteristic of tea drinking is that it produces fear and despondency. Dr. Morton, a nerve specialist of New York City, has published an account of the experience of a tea-drinker who was so irritable and peevish that it was almost impossible to live with him. He was all the time fearful that something was going to happen to him; for instance, whenever he passed a high building, he would look up to see if something was not going to fall upon him. He would look

behind to see if he were not pursued. He was afraid of being run over by every team that passed. He was sure that every dog he met was going to bite him, so he always carried an umbrella with which to fight dogs. This poor fellow was brought to this condition by the use of tea. I have met many persons who were in a similar state as a result of drinking tea or coffee. About three years ago I knew a gentleman who had been one of the chief coffee-tasters for the Arbuckles, the greatest tea and coffee dealers in this country. He could tell, by tasting, in what part of the world any specimen of coffee was grown, and in many cases could even indicate the particular coffee plantation from which it came. When this man came to me, he said he must give up his business. I asked him why. He said, "Because the very first sip of coffee that I take gives me such a nausea, such a disposition to vomit, that I can not do anything all day." This coffee-taster did not swallow the coffee; he simply took a little in his mouth, tasted it, and then ejected it, but this was so frequently repeated that enough poison was absorbed ultimately to bring him into a chronic state of poisoning.

I have been greatly surprised at the course of some of our leading temperance reformers in regard to the use of tea. They have labored to secure the introduction of tea- and coffee-houses for the purpose of winning people from the saloon, and it must have seemed to them that tea and coffee are a lesser evil. But have we a right to substitute a lesser evil for a greater? It is like saying to a thief, "Don't steal so much; if you must be wicked, be content with swearing." That is not the right sort of philosophy. By cultivating tea drinking, we are making drunkards, for we are lessening the inhibitory power and the ability to control the will, and laying the foundation for the use of stronger stimulants. A report published in Ireland has shown that tea drinking is responsible for a large share of the insanity which prevails in that country. The use of tea and coffee is recognized as one of the causes of the multiplying of nervous diseases among the men and women of America. I might give you several instances of persons who have rid themselves of sick-headache and dyspepsia simply by abandoning the use of tea and coffee.

We must conclude, then, that tea drinking is a sort of tippling, although the results are not so quickly shown as are those of alcohol tippling. We are on the wrong track in encouraging the use of tea and coffee as a substitute for alcohol, because its tendency is to feed a monster that is responsible for enormous mental, moral, and physical devastation. Let us have no substitutes for any of these dangerous drugs. We should not think of offering substitutes for lying, swearing, or stealing. The way to deal with any bad thing is not to try to find something else to take its place, but to discard it altogether, and to accept only the unquestionably good.

A GREAT LIFE ENDED.

A FEW weeks ago there died in England Dr. Norman Kerr, who has done more, perhaps, for scientific temperance than any other man in England, possibly excepting the late Dr. Benjamin Ward Richardson. Dr. Kerr gave special attention to the study of inebriety and the establishment of institutions for the treatment of inebriates. He was one of the founders of, and until his death was connected with, the famous Dalrymple Home for Inebriates. Dr. Kerr was for many years a total abstainer, and was also exceedingly temperate and frugal in his diet. He had for many years been afflicted with the renal disorder to which he finally succumbed.

Dr. Kerr has rendered invaluable service to medical science and to his fellow men in the careful observations and researches which he conducted, and especially in his effort to establish the fact of a diseased condition which might be properly termed in-

ebriety, as a distinction from the vice of drunkenness, and the development of a rational method for the cure and relief of this unfortunate class.

It is to be exceedingly regretted that this useful man should have been obliged to lay down his work when so well equipped for the highest usefulness. But his work will live and grow after him, and will, by the great mass of medical men, be even more appreciated in the years to come than it is at the present time.

HOW ENGLISH PEOPLE ATE TWO CENTURIES AGO.

At the present time English people are greatly given to eating. Three meals a day, though sufficient for the average American, only serve to whet the appetite of the Englishman, who demands at least two and sometimes three meals in addition. The custom of taking a bite "every few minutes," which to the newcomer seems to be the habit in England, is in the highest degree detrimental to the integrity of one's digestive organs, besides encouraging excessive alimentation. This Sir William Roberts pointed out as one of the serious evils which threaten the English people.

The modern English custom, however, is quite different from the habits of the men who laid the foundation of the noble empire upon which the sun never sets. According to Thomas Tryon, of London, a "student in physics," who wrote in 1691, in his "Wisdom's Dictates, or Aphorisms and Rules, Physical, Moral, and Divine, for Preserving the Health of the Body and Peace of the Mind," the proper times of eating, so regarded at that time, were "8 to 9 in the morning, and 3 or 4 afternoon;" he also admonished those who would eat wholesomely and long, in the following excellent words:—

"Let your Food be simple, and Drinks innocent, and learn of Wisdom and Experience how to prepare them aright.

"Moderate Hunger cleanseth all the Vessels of the Stomach, makes the Spirit brisk, and puts new thoughts into the Soul, rendering a Man fit to give the Lord thanks for all his Blessings."

The Alarming Increase of Cancer.

According to the *Physician and Surgeon*, Prof. Roswell Park makes the startling prophecy that if for the next ten years the present relative death-rates are maintained, in 1909 there will be more deaths in the State of New York from cancer than from consumption, smallpox, and typhoid fever combined.

For a number of years back, the English statisticians have been calling attention to the rapid increase of cancer in England. It has been almost universally noted that flesh eating and cancer are increasing at about the same ratio. The rice-eating natives of India are almost wholly free from cancer, which is found to be of most frequent occurrence among pork eaters and those who make free use of animal food. It is impossible for human beings to make cemeteries of their stomachs without suffering the natural consequences of polluting the vital stream with the products of disease and putrefaction. This is the means whereby a fertile soil is prepared, not only for cancer, but for consumption and many other maladies.

The British and World's W. C. T. Unions have created Food Reform departments. The Japan Union also has a Food Reform department. But the W. C. T. U. of America has none.

ANSWERS TO CORRESPONDENTS.

Prolapsed Stomach.— U. A. N. suffers from a prolapsed stomach, is given to overeating, and wishes to know what is a sufficient quantity of zwieback, granola, and fruits for one meal.

Ans.— Send ten cents to the Good Health Pub. Co. for the little booklets entitled, respectively, "The Daily Ration" and "How to Live on a Dime a Day." Five cents more will secure another little booklet, "Balanced Bills of Fare," which will doubtless be of interest to you.

Milk.— Mrs. L. W. W., Vermont, asks if milk from cows fed on ensilage is wholesome, and if milk gravy combines well with sour fruits.

Ans.— 1. No.

2. No.

Acidity of Stomach—Pop-corn — Meals.— A. W. L., California, a health reformer, asks (1) what to do for extreme acidity of the stomach; (2) if popped corn is healthful; (3) how many meals is it best to take a day, and at what time.

Ans.— 1. Find out the cause of the acidity. If it is fermentation, the stomach should be washed out, and a dry dietary of fruits, grains, and nuts should be adopted. Avoid vegetable foods and drinking at meals.

2. Yes.

3. Two meals a day are best, taken at eight o'clock in the morning and at three in the afternoon.

Nuts and Fruits.— J. H. M., Indian Territory, asks: "1. What is the nutritive value of the pecan? 2. What is its digestibility and food value compared with the peanut and the almond? 3. What is the best method of preparing it? 4. Will an exclusive diet of fruits and nuts perfectly sustain the body?"

Ans.— 1 The nutritive value is, on the average, about ninety per cent.

2. All these nuts, if well chewed, are digestible.

3. The pecan may be eaten in its natural state, as removed from the shell, or may be made into a very palatable and wholesome butter by rubbing the meats through a colander and crushing with a rolling-pin.

4. Yes.

Backache — Neuralgia — Walking — Climate.— A. T. W. A., Colorado: "1. Please advise a simple remedy for lameness in the small of the back. When leaning over at work, I feel sharp pains on both sides of my spine. 2. What causes neuralgia? 3. Is its seat in the nerves? 4. Is walking a good exercise for strengthening the muscles in the small of the back? 5. How is it that rheumatism and neuralgia are more troublesome in a high altitude? 6. Would a lower altitude benefit me?"

Ans.— 1. Try fomentations to the back for fifteen minutes every night, followed by a cold compress, consisting of a towel wrung dry, laid upon the back, covered with dry flannel, to be worn during the night. The pain may be due to prolapse of the bowels, in which case the natural abdominal supporter should be worn. (Address Modern Medicine Co., Battle Creek, Mich.)

2. Neuralgia has many causes, but is generally due to disturbed nutrition of the nerves.

3. Yes, but it is often reflex, from the irritation of the sympathetic nervous system.

4. Yes.

5. Because of frequent changes of temperature.

6. Many persons suffering from rheumatism are more comfortable in a low altitude.

Paralyzed Limbs from Congestion of the Brain.— G. G. B., Missouri, asks what treatment to follow for a child two years old whose left arm and leg are paralyzed from an attack of congestion of the brain.

Ans.— The child has probably had inflammation of the brain or spinal cord. Cold baths, massage, and electricity are indicated in cases of this sort.

Nuts — Disordered Stomach.— Mrs. D. H. M., Michigan, asks: "1. In what form should almonds be eaten? 2. Are they unwholesome when not blanched? 3. What will remove gas from one's stomach? 4. I eat no more than my stomach craves, but bloat terribly afterward. Eating causes an unnatural heart action. What diet would you suggest? 5. All kinds of sweets sour in my stomach. Shall I discontinne their use?"

Ans.— 1. Blanched and converted into meal and cooked in the form of a purée, or as almond butter; or, if the nuts are blanched and very slightly roasted, mix into a paste, and then add an equal quantity of water. By the addititon of water the nuts may be brought to the consistency of cream or milk, for which they furnish an excellent substitute.

2. Perhaps not. The woody covering of the nut is in the highest degree indigestible.

3. Get rid of the germs. The stomach may need to be cleansed by means of a stomach-tube. Antiseptic charcoal tablets are sometimes advisable, and a dry dietary of fruits, grains, and nuts; and the disuse of readily fermentable foods is to be recommended. Mushes, gruels, and similar foods must be carefully avoided.

4. It may be necessary for you to avoid starchy foods and vegetables, or to use foods in which the

starch has been partially predigested, as in bromose, gran nuts, granose, and various malted nut preparations.

5. No. Do not use ordinary sweets. You will probably, however, be able to use without difficulty such foods as malted nut preparations, protose, maltol, etc.

Itching of the Body.— S. M. H., Pennsylvania, asks the cause and cure of an itching of the entire body, which comes on periodically.

Ans.— If the itching occurs without eruption, it is probably a nervous disorder. Take a neutral bath for half an hour, at a temperature of from 92° to 96°; afterward apply talcum powder, or talcum powder and oxide of zinc in equal parts.

Sore Thumb.— D. M. P., Illinois, has had swelling of the thumb for six months, and it causes pain in her arm. It is not sore to the touch. She will be grateful for a remedy.

Ans.— The cause is probably disease of the bone. The case should be brought to the attention of a skilled surgeon.

"Shortening" in Bread.— L. H., California, asks if there is any physiological objection to "shortening" in bread, and if so, what.

Ans.— Free, or separated, fats, unemulsified fats in any form, all butter, lard, or any other form of grease should not be used for shortening bread. Any sort of fat mixed with starchy substances renders them indigestible. Bread shortened with butter, etc., is far less digestible than bread prepared of simply flour and water. The reason for this is that the saliva acts upon the starch only, and can not act upon fat. When the starch particles are permeated or covered with fat, the saliva can not digest them. The same is equally true of the particles of gluten in the bread, which are digested by the gastric juices.

To Increase Flesh.— J. C. C., Wisconsin, is desirous of increasing his flesh and asks for the best diet.

Ans.— Send to the Sanitas Nut Food Co., Battle Creek, Mich., for their catalogue of nut foods. This will tell you how to make a selection.

Closing of the Air-passages.— C. D. B., New Jersey, thinks that the climate there (a damp one) tends to close the nasal passages, and asks if spraying the nasal passages will overcome the difficulty.

Ans.— Use the Magic Pocket Vaporizer instead of the spray. This will relieve the difficulty with surprising promptness.

Solution for Sore Throat.— H. B., Indiana, asks how the B. C. M. E. W. solution is to be applied.

Ans.— The Pocket Vaporizer is an improvement on this method more convenient to use.

Teeth.—Mrs. M. L. H., New York, asks why a child of three and a half years who has lived principally on fruits and graham wafers should lose her teeth. A black substance near the gums seems to eat them off. She does not chew her crackers, but holds them in her mouth until they are dissolved.

Ans.— The loss of the teeth in such cases is an evidence of constitutional weakness. The mouth is thoroughly infected with germs, and should be examined by a dentist, disinfected, and treated thoroughly until the ulcers have healed.

Fruits and Vegetables — Unfermented Grape-Juice.— C. M. M., New York, is "all at sea" in regard to combining fruits with vegetables, and would like some definite rule to follow.

Ans.— If the diet consisted of fruits, grains, and nuts, there would be no difficulty about combinations. Vegetables are not a natural food for human beings.

Dandruff — Wetting the Head.— F. D. H., Wisconsin: "1. What can be done for dandruff? 2. Is it better for the scalp and the hair not to wet the hair before combing it? 3. Is it better to wet the head before taking a shower-bath? 4. Does the frequent use of the shower-bath cause the hair to fall out?"

Ans.— 1. Shampoo the head thoroughly twice a week with cold water, applying afterward a mixture of equal parts of alcohol and castor-oil.

2. Soft water does the hair no harm.

3. Yes, as the bath has a tendency to send the blood to the head.

4. No.

Eggs — Mushrooms — Milk.— A Toronto subscriber asks (1) if eggs and mushrooms are desirable as foods; also (2) what is the objection to using cow's milk.

Ans.— 1. No.

2. Cow's milk is a good food for calves, but is not a natural food for human beings. Send two cents to this office for pamphlet entitled "Cow's Milk as a Cause of Disease."

Nuts — Fruit and Granose — Maltol — Food for Child — Diet for Nursing Mother — Eskay's Albuminized Food.— C. J. P. asks: "1. What are the cheapest forms of nuts for a person to live on? 2. Can a person subsist entirely on fruit and granose? 3. Can maltol be substituted for tea and coffee, or is it a food in itself? 4. What would you recommend as a supper for a growing,

active child of three? 5. Can an expectant mother in any way increase the flow of milk so that she can nurse her child? What is the best diet for a nursing mother who must live as cheaply as possible? 6. If a child can not have its natural milk, which do you prefer, cow's milk or a food? 7. Have you ever tried Eskay's Albuminized Food? If so, with what results?"

Ans.— 1. Peanuts, in this country; in Samoa, coconuts; in Italy, chestnuts.

2. Yes, but the addition of fat is necessary for perfect health. Nuts should be added.

3. Maltol is a food. Fruit-coco is a good substitute for tea and coffee.

4. Fruit, with a small amount of granose.

5. Yes, by the use of malted nuts, granose, fruit-coco, and other healthful foods.

6. Diluted cow's cream well sterilized, almond cream, granose, and Sanitarium Infant Food.

7. No.

Itching — Cold Limbs.— M. W. D. A., Illinois: "1. What is the cause and cure for an intense itching, at night, of the skin near the ankles? There is no eruption, and the person is in apparent health, though nervous. 2. What causes cold lower limbs, numb feeling of the eyelids, stiff fingers; also often mental depression on waking in the morning?"

Ans.— 1. This is doubtless a nervous condition of the skin. Try an application of talcum powder, or a mixture containing one part oxide of zinc with three parts of talcum powder. A neutral bath taken half an hour before retiring, at a temperature of from 92° to 95° is usually beneficial. The talcum powder should be applied directly after the bath.

2. Irritation of the abdominal sympathetic nerve, due to disordered digestion, associated most probably with dilatation of the stomach, is undoubtedly the cause of the symptoms noted. Either hypopepsia or hyperpepsia may be present. An examination with a stomach-tube is necessary to determine this. The patient should spend a few months at a properly equipped sanitarium.

Drinking Water.— Mrs. H. McL., New York, asks if there is any simple test by which objectionable animal or vegetable matter may be detected in drinking water.

Ans.— No; such water may be sent to the Laboratory of Hygiene at the Battle Creek Sanitarium for examination. If you are a subscriber to GOOD HEALTH, you are entitled to such an examination without charge. One gallon should be put into a clean new jug, with a clean new cork, and sent by express to the Good Health Pub. Co., Battle Creek, Mich. A letter should be sent at the same time, calling attention to the shipment, and giving all particulars concerning it. Rinse the jug thoroughly with the same kind of water which is to be examined before the water is put into it. Be sure the jug has never been used for any other purpose, and is thoroughly clean.

Indigestion.— I. R. W., New Jersey, is troubled with regurgitation. She asks what form of indigestion it indicates, and what will cure it.

Ans.— The muscular structures of the stomach are irritated. The moist abdominal bandage worn at night will perhaps give relief.

Vitiation of Atmosphere by Lamp or Oil-Stove.— A. F., Virginia, asks (1) what percentage of the atmosphere in a room is vitiated by the use of an ordinary oil-stove; (2) If the danger is obviated to a great extent by the use of water placed on the oil-stove.

Ans.— 1. A lamp produces about as much carbonic gas as a person.

2. No; oil-stoves are dangerous to life. The writer has known of persons being suffocated by being shut up in small rooms with oil-stoves.

After-Dinner Nap.— H. R. P., New Hampshire, asks why an after-dinner nap is not healthful.

Ans.— For the reason that activity of the brain is necessary for good digestion.

The Retina.— A. J. C., Pennsylvania, has had her eyes treated and examined for new glasses, but they have become much worse, due to a so-called sensitive retina. 1. "Will you kindly tell me something about the retina? 2. Do you think that the trouble is a serious one?"

Ans.— 1. The retina is an extension of the optic nerve.

2. Yes.

Muddy Urine.— H. L. M., New York, writes: "1. My son, twenty-five years old, born a vegetarian, himself practically a vegetarian, is troubled with muddy urine and occasional heaviness over the kidneys. His diet has always been practically that of a vegetarian, with sometimes poultry or fish. What treatment would you advise?"

Ans.— The cause of muddiness may be phosphates or urates, or both, or possibly catarrh of the bladder. A specimen of the urine should be placed in the hands of a competent physician for examination; then a proper prescription can be made. The difficulty, in any case, can not be due to the non-use of flesh-foods, but in the highest degree contra-indicates their use.

Goiter.— Mrs. J. C. B., Michigan, would like to know how long and how often the ice-bag should be used for goiter.

Ans.— It is a good plan to wear an ice-bag overnight, covering the skin with one thickness of flannel to prevent excessive chilling.

LITERARY NOTICES.

PROFESSOR WILLIAM CUNNINGHAM, of Cambridge, England, opens the July **Atlantic** with a valuable paper on English Imperialism, in which he shows the gradual development of English policy from the Nationalism of a hundred years ago (which meant the exploiting of all colonies and possessions for the benefit of the mother country), to the Cosmopolitanism of the present day, which seeks the greatest good of all through fair play and equal treatment to all men and all nations. Jacob A. Riis continues his tenement-house studies with a paper on "Curing the Blight," showing how by persistent endeavor the most recalcitrant landlords have been "druv into decency," and detailing the changes for the better, and the improved conditions that have resulted from sustained and intelligent effort.

Prince Kropotkin continues his Autobiography and treats of his experiences and sufferings in the terrible Fortress of St. Peter and St. Paul, describing its character and its awful history, and relates in the most thrilling and exciting manner the means and methods by which he made his remarkable and fortunate escape therefrom

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The midsummer **Outlook** is replete with articles of interest. "The Week" deals with the great questions of the day in a broad, clear way. Then follow editorials by Dr. Lyman Abbott. Among the contributed articles are "Books for Vacation," with portraits of their authors, by James Mac Arthur; "The Love Letters of Two Poets,"—Mr. and Mrs. Browning,—by Lyman Abbott; "America's Working People—The Negro as a Citizen," by Charles B. Spahr; "The Eccentricities of Reformers," by Thomas Wentworth Higginson; "Hebrew Prophets: Ezekiel," and "Georges Picquart." Then follow departments on "Books and Authors," "The Religious World," and "For the Little People." The Outlook Company, 248 Fourth Ave., New York. $3 a year.

Magazine readers of the summer months will find many articles of great interest in **Self Culture** for July. An amusing paper by F. W. Fitzpatrick, entitled "Fashion's Slaves," with pen and pencil drawings by the author, criticizes freely the vagaries of Dame Fashion and her feminine devotees. A well-drawn silhouette of the true feminine form (the correct dimensions of which are given) stands side by side with a reproduction of a modern fashion-plate figure, and the reader is invited to attempt the fitting of the latter's dress, with its nineteen-inch waist, over the natural, uncompressed, twenty-eight-inch waist of the model. Self Culture Magazine, Akron, O.

The **Inland Printer** is the best printers' journal published in this or any other country. Besides being filled with practical instruction in all lines of the printers' trade, it is a work of art down to the last detail. The Inland Printer Co., Chicago, Ill. $2 a year.

The **Forum** has a number of interesting articles this month. Among them are: "The Trust Problem and Its Solution," by Ex-Senator W. A. Peffer; "Lord Roseberry and the Premiership," by H. W. Lucy, who contributes the weekly "Essence of Parliament" to *Punch*; "Was Columbus Morally Irresponsible?" by Prof. C. Lombroso, the eminent criminologist; and "The Future of the Negro," by W. H. Councill, the colored president of the Agricultural and Mechanical College for Negroes, at Normal, Alabama.

Dr. Pierson's article on "Ramabai and the Women of India," in the July number of the **Missionary Review of the World** is one of thrilling interest, and deserves a prominent place among the Miracles of Missions. It is profusely and uniquely illustrated from original photographs, and contains a great deal of information not contained elsewhere. Dr. Pierson gives an excellent idea of the deplorable condition of Hindu women, especially widows, tells the romantic story of Ramabai's life, and describes the work which she has done and is doing in behalf of these unfortunate child-widows.

Another timely article is that by Miss Belle M. Brain, "A Record of Fifty Years," giving the history of the Hermannsburg Mission which was founded just half a century ago by Pastor Louis Harms. The wonderful story of Metlakahtle, an ideal missionary station among the Indians in Alaska, is told by Rev. Edward Marsden, an educated Christian Indian, and by Mr. William Duncan, the founder and director of the work. This village is a model settlement, and is well pictured by pen and camera. The other articles in this number of the *Review* are scarcely less interesting and important. Rev. Arthur H. Smith and others write of "Recent Reform Movements in China." Published monthly by Funk and Wagnalls Co., 30 Lafayette Place, New York. $2.50 a year

PUBLISHERS' DEPARTMENT.

WE are glad to announce that the New England Sanitarium, located at South Lancaster, Mass., was formally opened July 5.

An institution of this kind has long been needed in the East. The marked success of the Summer Sanitarium at Prohibition Park last season gave unmistakable evidence that New England is ready to receive with appreciation an enterprise of this sort. Dr. C. C. Nicola, who will take charge of the institution, has been spending the last few months in London, England, making himself familiar with all that is new and valuable in medical practise, which can be utilized in sanitarium work. Mrs. C. C. Nicola, a well-qualified lady physician, reports that her hands are already full of work.

New England, on account of its dense population, has more sick people to the square mile than any other part of the United States; and there is, perhaps, no place in the world where an institution of this sort is more needed or has before it such prospects of success as in Massachusetts, one of the most densely populated States in the Union. South Lancaster is located conveniently near Boston and other large cities, and as soon as the merits of the institution become known, the commodious and beautiful building which has been secured for the Sanitarium will be filled to its utmost capacity.

The New England Sanitarium will receive a cordial welcome to the sisterhood of similar institutions which now belts the world, all being outgrowths from the work begun at the Battle Creek Sanitarium thirty-three years ago, and conducted in harmony with the same principles which are recognized in the mother institution, by the physicians and nurses who have had experience and training at Battle Creek.

Portland Sanitarium Missionary Nurses.

THE first annual commencement of the Portland (Ore.) Sanitarium Missionary Nurses' Class took place July 6, 1899, at 3 P. M. The program was as follows: Music; Invocation; Solo by Miss Emma Hubbard; Address, Elder W. J. Burden; Drill in Physical Culture; Duet by the Misses Shaffer; Emergencies; Presentation of Diplomas; Song, "Jesus, Lover of My Soul;" Benediction. About one hundred and fifty citizens responded to the invitation to be present.

The two addresses occupied the larger part of the time, the speakers setting forth the grand principles upon which the institution is founded, and the character of the work carried on there. The "Emergencies" seemed to attract the most attention. Every one sat spellbound, watching the resuscitation of one who was brought in apparently drowned; and while all were working faithfully with the drowned person, a second one was brought in with a broken arm. The fracture was reduced with great coolness and skill. Before they had given these patients all the attention necessary, a third, with a dislocated shoulder, appeared on the scene. He was taken in charge by the nurses, and received proper and careful attention. As the treatments, bandaging, etc., were administered, all the processes were fully explained to the audience, which made the exercise not only interesting, but instructive as well.

Dr. Hubbard then presented diplomas to Misses Ida Mary Weiland, Mamie Etta Hardcastle, Margaret Elizabeth Shaffer, and Mabel Rebecca Shaffer.

Health Foods in Oregon and Washington.

THE Portland Sanitarium Health Food Co. has ordered a large reel oven, cracker machine, dough mixer, break, granose mills, etc., and hope within a few weeks to be in a position to supply the people in that territory with as good health foods as it is possible for an experienced, first-class plant to produce.

Look out for other announcements in the next number of GOOD HEALTH.

Spanish-American War Panorama is one of the war books which is likely to be in continuous demand. It is a panoramic record of the triumph of "Yankee Doodle." The eagle flaps his wings on every page, and "Old Glory" waves around and above every scene. Prominent officers connected with the war are here portrayed, as well as many of the "men behind the guns." Military life is pictured to the eye, from recruiting to guard mount and skirmish line; nor is the ludicrous omitted. The company cook receives the attention due to his importance; the mess is shown; cavalry scenes are given; the hospital arrangements are depicted; the heroines of the Red Cross service are displayed; street scenes in Havana, Santiago, and elsewhere are unrolled, the new citizens or subjects (which are they?) of Uncle Sam appear and disappear as the leaves are turned. In a word, the gazer visits the new localities and sees the tumultuous new life, without the risk or expense of a sea voyage.

The album is 5½ x 8 inches, weighs 12 ounces, printed on finest coated paper. Sent free to any address in the United States, Canada, or Mexico, for twelve cents in stamps or coin, to cover postage and packing. Copy may be seen at any ticket-office of the Big Four Route. Order at once, as the edition is limited. Address Warren J. Lynch, General Passenger and Ticket Agent "Big Four Route," Cincinnati, Ohio. Mark envelope "War Album."

THE FIRST ANNIVERSARY.— It is just a year since the Chicago, Milwaukee & St. Paul road inaugurated its celebrated Pioneer Limited passenger train service between Chicago, Milwaukee, St. Paul, and Minneapolis. This service marked a new era in the railway world in the line of passenger accommodations. At a cost of a quarter of a million dollars that progressive company furnished the traveling public, in its Pioneer Limited train, comforts and facilities the best ever produced. This train has been described many times in newspapers and magazines, but should be seen and examined to be appreciated. In beauty of finish, richness and elegance of furnishings, nothing equal to it has ever been attempted by any other road. The car builders were nearly a year in completing the Pioneer Limited trains (there are two—one leaving Chicago for the West and the other leaving the Twin Cities for the East every evening in the year), and they stand to-day a monument to the builder's art. No regular passenger-train service in America is so well known as the Pioneer Limited. From the standpoint of passenger traffic the last twelve months have been the most successful in the history of the St. Paul road, made so very largely by the Pioneer Limited. The patronage of this service is a striking illustration of the fact that the public appreciates a good thing.

FIRST-CLASS STEAMBOAT SERVICE BETWEEN DETROIT AND CLEVELAND AND TOLEDO, DETROIT, AND MACKINAC.—D. and C. floating steel palace steamers are now running daily between Detroit and Cleveland. Two trips per week between Toledo, Detroit, and Mackinac Island. Regular service began June 17. Spend your vacation on the Great Lakes. Send 2 cents for illustrated pamphlet. Address A. A. Schantz, G. P. A., D. & C. Line, Detroit, Mich.

LADY AGENTS wanted to sell flavoring extracts and perfumes. It will pay you to write me. R. W. Snyder, 140 E. Canal St., Battle Creek, Mich.