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THE LIVER.

A LECTURE DELIVERED IN THE SANITARIUM
PARLORS AUG. 15, 1882.

BY J. H. KELLOGG, M. D.

LADIES AND GENTLEMEN:—

I see by the large audience this morning that the liver is a very interesting subject. There is no organ in the body that is so much complained about as the liver. No matter what is the trouble with the man, if he feels bad in any way he lays it all to the liver. It is not one time in ten that the fault is with that organ, but it has to take all the blame, nevertheless.

I wish to talk this morning about the relation of diet to the liver. I called your attention yesterday morning to the fact that there were certain articles of food especially injurious to the liver in health. I spoke in particular of the bad effect of overeating. A person who eats too much imposes too much work on the liver. If you examine the liver after a meal, you will find it somewhat enlarged. If you press the ends of the fingers close up under the ribs on the right side, you can feel the border of the liver. Some people think the liver is where the stomach is. I was very much amused a few years ago, at a council of physicians held over a doctor whom I had been called in to see. He had been quite ill, and had sent for me to attend him. I did so, and he began to get well so fast that his brother doctors thought he was going to get well without medicine; so they called a consultation, and it was decided that he had disease of the lungs. One doctor put his fingers over the stomach, and said, "His liver's all right; there's nothing the matter with

his liver." The doctor's hand did not come within two inches of the liver. The liver is entirely under the ribs, so that it cannot be reached without pressing the fingers up under the ribs about an inch. You can feel the lower border in that way.

Suppose you eat an enormous meal—what some people call a "square meal." (Sometimes our patients go outside of the Sanitarium to get a "square meal," and then we have to give them fomentations over the stomach in the night.) If the liver was an inch above the lower border of the ribs in the first place, it is only half an inch now. The reason for this enlargement is that it is filled with blood, and is swollen in size, just as a sponge becomes larger by being soaked in water. Its diameter is from one-fourth to one-half inch greater than it was before the meal. A sort of physiological congestion has taken place, just as a physiological congestion occurs in the stomach after a hearty meal. Now if a person eats too much breakfast and dinner and supper day after day, he keeps the blood-vessels of the liver so distended that they finally remain in that condition, and the liver becomes permanently enlarged, or, as we say in medical language, it is in a condition of passive congestion.

Another bad habit in eating is the use of too much fluid at meals. By drinking too much at table, the congestion of the liver is much increased, and it is partly on this account that the use of tea and coffee, or large quantities of water, is objectionable. We now come to speak of some of the specific articles of diet by the use of which the condition of the liver is affected. I wish to speak in the first place of the use of fats. Every one knows

that the use of fats makes people bilious. This is the common idea, and there are few popular ideas so well founded. At first sight, however, the reason may not be very evident. A gentleman asked me the other morning this question, "If it is the business of the liver to eliminate fats, why not give it plenty of fats to eliminate, and thus furnish it an opportunity to work at its proper trade?" Now this subject is on a thoroughly scientific basis. I am not going to give you any fanciful theories about it, but will set before you facts which have been substantiated by scientific investigation. Many years ago a series of experiments on the subject of diet was begun in Europe, and these experiments have been carried down to the present time, with very curious and useful results. Different kinds of animals have been taken by these experimenters, fed upon various sorts of food, and the results in each case carefully noted. One took a goose, and for weeks fed it upon nothing but butter. The result was that the goose became entirely saturated with butter. At a *post-mortem* examination held upon the goose, it was found that the liver had become so enlarged as almost entirely to fill the whole abdominal cavity, and was so full of butter that a large quantity of that substance could be squeezed out by mechanical pressure.

Then another experiment was tried. A dog was placed under the influence of chloroform, and the little duct which carries bile to the intestinal canal was tied. Into this duct a little silver tube was inserted, and to the lower end of this tube a bladder was fastened. To illustrate this on the blackboard, suppose that A is the liver, B the intestine, C the little duct, and D the silver tube. It is quite easy to reach this duct in some animals. After a time, the wound heals up, and the dog or other animal can run about with this appendage hanging to him just as well as before. A dog in this condition enjoys good health, and seems to be quite as happy as other dogs. In the course of the experiment, after the dog had been in this condition for some time, and had recovered from the shock of the operation, various articles of food were administered, and the amount of bile secreted in each case was observed. It was found that when the dog was fed upon fats, the amount of bile secreted was very small; and when he was fed upon pure fat and nothing else, there was scarcely any bile at all. When the dog was fed upon food one-

third or one-fourth fat, the amount of bile produced was in proportion. In general, when there was quite a proportion of fat in the food, the amount of bile secreted was about one-third what it ought to be.

Now we are prepared to answer the question I spoke of a moment ago;



namely, if the fat is eliminated by the liver, why does not the amount of bile increase with the amount of fat consumed? It would seem to be a natural consequence that the more fat there was eaten, the more bile there should be secreted. Let us see if we can find a rational answer to this seeming anomaly.

When we examine the liver under the microscope, we find that it is made up of millions and millions of what are called hepatic cells. These cells are six-sided, and are put together, as I have repre-



sented them here on the blackboard, just like a honey-comb. The blood-vessels run along among these cells. A blood-vessel will come up on one side, and the duct to carry off the bile will come up on the other. The blood passes through with the constituents of food, the cells pick out the elements which should be eliminated, and the bile-ducts carry them off to the intestines.

Now, what happens when a person eats fat? You will remember what I told you the other day about it. The bile emulsifies the fatty elements of the food; that is, it divides them up into very small particles so that they can be absorbed. Some of you saw the specimen of milk under the microscope the other day, and you remember that instead of being the simple white fluid that we generally consider it, it was composed of innumerable globules of fat. The food becomes divided up in the same way, and while in this condition it possesses the power of passing through the walls of the blood-vessels. The liver has a habit of absorbing into itself certain substances which get into the circulation. If a person takes arsenic or mercury, it will collect chiefly in the liver. The same thing occurs in regard to fat. These little hepatic cells become saturated with fat, and they are just as fit for doing their proper work while in this condition as a race-horse would be for his if brought out upon the race-track loaded down with sand-bags. These cells are so completely loaded down with fat that they cannot perform their work of secreting bile, and, consequently, the quantity of bile produced is much less than under ordinary circumstances. This is the reason why the use of fat decreases instead of increasing the quantity of bile. As I said before, this fact does not rest upon a theoretical basis. Examinations of livers have been made, and they have been found in some cases so infiltrated with fat that it was a wonder how they ever did any work at all.

Now, there are various other articles of diet besides fat that injure the liver. There is sugar, for instance. Why should a bilious person avoid the use of sugar? The reason is that sugar is one of the articles of food that has to be acted upon by the liver; and if a person takes too much sugar, the liver has more work than it can do properly. It has several different kinds of work to do; and if too much digestive work is imposed upon it, as when a person takes too much sugar, it is obliged to neglect some of its eliminative work or other duties. It has no time left to destroy worn-out blood-corpuscles, or to convert uric acid into urea, or to do some of the other odd jobs that it has on hand; and thus through the failure of the liver properly to perform all its offices, the blood becomes stagnant and full of impurities, and all sorts of difficulties arise.

Condiments, also, are particularly bad for the liver,—mustard, ginger, pepper, pepper-sauce, and all the rest, not omitting salt. How do we know that? First, by actual experiment. Go into countries where they use pepper very freely, as they do in all warm climates, and you will find that almost every one is troubled with a diseased liver. It is a very singular thing that the warmer the country, the more pepper there is used. In Central Africa nearly all the native dishes are "peppery." A favorite Mexican dish has been described as follows: First, pepper; second, mustard; third, salt; fourth, a very little potato; then salt, mustard, pepper, and a little potato again. By the use of such dishes as this, the liver will very soon become seriously diseased.

Now what effect do these articles have on the liver? They are stimulating at first. You apply a mustard plaster to stimulate the skin, and it is sometimes very useful on the outside; but the wonder is that persons do not see that the same effect is produced on the inside. You can find any number of persons who would be horrified at the idea of a mustard plaster smarting and burning on the outside, while they think nothing of putting a mustard plaster on the inside. The reason why it can be tolerated there is that the mucous membrane of the stomach is almost insensible to pain. Suppose you put a little mustard in the eye. You put your hand to your eye at once, and call for water to stop the pain. It would not take very long to break up that habit. In fact, I never saw any one who was a slave to the habit of putting mustard in his eye. But persons will put enough mustard in their stomachs to make a good mustard plaster all over the surface of the stomach, and yet it will not be felt at all. This insensibility on the part of the stomach is a very good thing. If it were not so, a person would feel a shock each time the food dropped into the stomach. Then he would feel all the processes of digestion going on in that organ, and he would have to be thinking about them all the time. As it is, if a man is in a healthy condition, and eats the proper kind of food, he ought not to be conscious that he has any stomach at all.

Now all these things that persons take to tickle their palates and stimulate their stomachs are absorbed. They are not digested, but are taken into the blood in

the same condition in which they are eaten. Of course, they go directly to the liver. You know what the effect of a mustard plaster is on the surface of the body, and yet the body is protected by a skin so stout and tough that I have seen a capital pair of boots made out of it. In the case of the liver, however, there is no tough skin to protect the delicate cells from the action of the irritating mustard or pepper, and so these harmful substances have full opportunity to do their worst. As I said before, their first effect is stimulating. The stomach is incited to action, more gastric juice is secreted, and the liver is stirred up to produce more bile. Thus for a short time the digestion is actually better. If, however, after a person has been using condiments for a long time he attempts to leave off, he finds that he cannot do it without producing very unpleasant consequences. As soon as he attempts to stop, he is troubled with flatulence and sour stomach, and bad taste in the mouth. The fact is that the organs have been so stimulated and whipped up for a long time by these irritants, that they will not work without them. Their case is like that of a horse that has been whipped so much and so long that he has become so lazy he will not go until he has had a good beating. After the liver has been whipped for six months, or six years, or sixty years, it at last gets so lazy that it will not work at all until it has been thoroughly whipped with stimulants, and the time finally arrives when it refuses to go, no matter how hard it is beaten.

Now let me briefly summarize what we have learned this morning. We have learned, first, that overeating is bad for the liver, because it produces distention of the blood-vessels, and leads to a permanent state of congestion and enlargement. In the second place, drinking too much fluid at meals is to be condemned for the same reason. Thirdly, we have found that fat is bad for the liver, since it tends to clog up the hepatic cells, and thus fill the liver with a sort of debris, or rubbish, that prevents it from performing its work properly. In the fourth place, the use of sugar is to be avoided, because it gives the liver too much digestive work to do. Finally, we have learned that condiments are hurtful, for the reason that they act as artificial stimulants, forcing the liver to do more work than it ought to do for a time, but finally rendering it so inactive and torpid that it cannot do any work at all.

WHAT TO EAT.

BY MRS. E. E. KELLOGG, SUPERINTENDENT OF HYGIENE FOR THE NATIONAL W. C. T. U.

VERY few people ever stop to inquire what particular diet is best adapted to the maintenance of perfect health, but whatever gratifies the palate or is most conveniently obtained, is eaten without regard to its dietetic value. Perchance it may be a valuable aliment, but it is as likely to be something largely or quite devoid of nutrient properties. Far too many meals partake of the characteristics of the one described in the story told of a clergyman, who, when requested to ask a blessing upon a dinner consisting of meat fried to a crisp, potatoes swimming in grease, and bread sour, soggy, and ponderous, demurred, on the ground that the dinner was "not worth a blessing."

Without doubt, the lack of care respecting diet is largely due to ignorance of the intimate relation existing between food and physical and mental health, and a lack of knowledge as to what qualifications are essential to constitute any substance a proper article to supply the alimentary needs of the body. We can forego a knowledge of many things, if need be, but we cannot afford to be ignorant respecting the fitness of the materials which we should use in making our bodies what they were designed to be,—“temples of the Holy Ghost.”

As relates to the diet of man, food may be defined as any substance, which, when introduced into the system, is capable of supplying the loss occasioned by the natural wastes of the body; and that food is the best by means of which the desired end may be most readily and perfectly attained. The great diversity in character of the several tissues of the body, makes it necessary that food should contain a variety of elements in order that each part may be properly nourished and replenished. The three classes of elements most essential, are, nitrogenous or albuminous, which, as demonstrated by the experiments of Profs. Flint, Liebig, and other eminent physiologists, are the chief supporters of vital activity and muscular and nervous effort; the carbonaceous, or heat-producing agents; and the inorganic, or mineral elements. Experiments upon both animals and human beings show that it is necessary that the various food elements, especially the albuminous and carbonaceous, be

taken in certain definite proportions, as the system is only able to appropriate a certain amount of each, and all excess, especially of nitrogenous elements, is not only useless, but even injurious, since to rid the system of the surplus imposes an additional task upon the digestive and excretory organs.

Most articles of food are deficient in one or the other of these elements, and need to be supplemented by other articles containing the deficient element; since it has been clearly proven, at the expense of numberless dogs, rabbits, and other small animals, that no one of the food elements, taken alone, is capable of supporting life.

To employ a dietary in which any one of the nutritive elements is deficient, although in bulk it may be all the digestive organs can digest, is as really starvation, and will in time occasion the same results, as total deprivation of food.

The most extensively and generally used article of diet is bread. It has been most fittingly termed the "staff of life," though very much that is called by the name might be more properly styled "a broken reed." Bread *may* contain all the elements of nutrition in exactly the right proportion, for chemical analysis shows that wheat-meal contains just the required amount of each of these elements. The food elements are found, however, in different parts of the wheat berry, and not uniformly distributed through its structure; the central portion is chiefly starch, while the glutted, or nitrogenous portion, is found just inside the outer husk; consequently, flour from which the outer portion of the grain has been removed, does not contain the requisite bone-and-muscle-building material. Fine flour is made of the inner part of the grain, and is composed almost entirely of one element, starch, the carbonaceous, or heat-producing agent, and will not alone support life.

Repeated experiments have shown that a dog will die of starvation in forty days when fed upon white or fine-flour bread alone; while dogs fed upon whole-wheat flour bread, suffer no deterioration in strength or loss in weight. The only reason people do not die under a regimen of fine-flour bread is because life is eked out by an occasional supply of other elements obtained from milk, eggs, beef, or some other food rich in albuminous elements; but that a starvation of brain,

and muscles goes slowly but surely on, is attested by the thousands of pale-faced, thin-blooded, nerveless, dyspeptic women and children all over our land. The habit so common among young ladies and school girls of attempting to satisfy the demands of nature with white bread and butter, pickles, pastry, and knick-knacks, is just as certain to impoverish the blood, as abstaining from food altogether, the only difference being the time required to bring about the result. The most eminent physicians of to-day assert that without doubt much of the nervousness so characteristic of American women, is in a large degree due to impoverished diet; neuralgia, the bane of so many women's lives, is only the demand of tired and starved nerves for better food and more rest. Fine-flour bread is especially detrimental for children, as from lack of proper bone, nerve, and muscle material, it interferes with normal development. Many a case of reckless dissipation and drunkenness among college youths doubtless has its origin in an impoverished dietary. Stimulated by parents and teachers to efforts far beyond the capability of a weak and poorly fed body, recourse is had to some artificial means of exciting the weak energies to increased effort, and little by little the young man accustoms himself to resort to the use of stimulants. Had he been reared on substantial and healthful food, sound physical health would have secured a degree of mental activity which would have rendered superfluous even the suggestion of the necessity for artificial stimulant.

The prevalent idea that foods made rich with fats are the most nourishing, is a grave error. The nourishing qualities of any food depend upon its digestibility as well as upon its food elements. Fat is undoubtedly a true alimentary element, and when taken in proper quantities and in a proper manner, serves a good purpose in the vital economy; but its excessive use is injurious, as it is an article most difficult of digestion. The same is true of the too abundant use of sugar. Really "rich" foods are those which contain a large proportion of the essential food elements in a condition in which they can be easily assimilated. Whole-wheat meal bread, oatmeal cracked wheat, and other whole grain preparations, are really "rich" foods. They also constitute the most perfect of all foods, since they not only contain all the ele-

ments of nutrition in proper proportion, but in a form easy of digestion, and free from deleterious elements. The common idea that oatmeal, graham, or wheat-meal, and similar foods, should be taken only when a person needs to take a "light diet" is a great mistake. A comparison of the nutritive value of the food grains with beefsteak and other flesh foods, shows that a pound of the grain is equivalent to two or three pounds of flesh food.

The mistaken notion referred to, has given rise to a great excess in the use of animal food, which is deleterious to health, especially that of children, exciting the nervous system, and thus producing a tendency to the use of artificial stimulants. The experiments of Dr. Napier, of England, published a few years ago, show very clearly that an exclusively grain and fruit diet is one of the most effectual means of combating the appetite for alcoholic liquors.

Such condiments as pepper, mustard, pepper-sauce, and other pungent sauces, may be banished from our food without sacrificing anything of real nutritive value, and with decided advantage to the digestive organs, which by over-stimulation lose their natural tone and become unable to perform their work without the aid of artificial excitants, as the lazy or tired horse requires the stimulus of the whip or spur to goad it to activity.

Perhaps we may venture a word about tea and coffee, though we dare not attempt to tell the whole truth about these supposed harmless beverages, lest we should be considered whimsical by some of our sisters who are wedded to "the cup that cheers, but not inebriates," but nevertheless contains a narcotic which holds its victim with a spell almost as strong as the nepenthe of the ancient Greeks. Dr. Arlinge, of England, asserts that he has frequently met, among the women of laboring classes of that country, "tea-drunkards;" and the evidence that this common beverage is by no means so harmless as has been supposed, is yearly accumulating. All medical authorities agree that its use is a frequent cause of dyspepsia and nervousness; and Dr. Bock, an eminent physician of Leipsic, ascribes to its influence many of the nervous disorders to which women are subject. We doubt not the propriety of recommending tea as a substitute for alcoholic drinks, but seriously question whether it is safe to recommend it as a

perfectly harmless substitute. May there not be some ground for the assertion made by persons who have had wide opportunity for observation, that with persons of a certain temperament the use of tea produces, in time, a desire for a still stronger degree of artificial stimulation, which is most readily found in alcoholic drinks? What has been said of tea applies also, of course, to coffee.

The pastry, preserves, rich sauces, gravies, cakes, pies, puddings, and various dainties so commonly employed as "dessert," are articles which possess little or no nutritive value as foods, and are usually so compounded as to be almost absolutely indigestible, and productive of no end of mischief in the laboratory of the stomach. Their indigestibility not only renders them valueless as foods, but hinders the digestion of other wholesome foods with which they are mingled. Oranges, apples, and other fruits, as well as parched corn, a few of the better varieties of nuts, and similar articles of little nutritive value, but wholesome and easy of digestion, are much to be preferred to the usual luxurious and highly flavored dishes offered at the close of the meal, which only serve to tempt people to eat more who have already eaten enough.

The simplest food is, as a rule, the most healthful. Variety is necessary; that is, a judicious mingling of grains, vegetables, fruits, and meats, since too much sameness clogs the appetite; but there is a marked tendency to furnish our tables with too great a variety of complicated dishes. Especially is this true upon occasions when guests are to be entertained at our homes. The unselfish disposition which prompts one to provide liberally for one's friends is commendable; but it is not true hospitality to multiply dishes to an injurious extent, nor furnish our tables with articles inimical to the physical welfare of our guests. God has provided a bountiful supply and plentiful variety of substances for man's nourishment, but he did not design that man should partake of all this variety at a single meal. The use of too great a variety of tempting viands is without doubt responsible for most of the surfeiting and excesses in eating. Mothers who tempt their little ones with a multiplicity of luxurious and highly-seasoned dishes, may be fostering the very love of appetite which in after years they would give all they possessed to correct. Intemperance in eating is a round on the ladder, and but

a few steps above, that which leads down to the drunkard's ignominious grave; the over-indulgence of a natural appetite soon leads to the creation and indulgence of wholly unnatural desires. "Touch not, taste not," is a motto that should be carried further than the mere use of intoxicating drinks. True temperance ought to teach us to abstain from that which is injurious in food as well as drink, and use judiciously only such articles as are healthful and nutritious.

HYGIENE IN SCHOOLS.

THE importance of introducing the study of hygiene into the public schools is thus forcibly set forth in the following extract from an able paper on the subject in the *New Orleans Medical and Surgical Journal* :—

A single generation instructed in hygiene would greatly increase the number of sensible parents, who, heeding less the foolish counsel of ignorant nurses, of prejudiced grandmothers, and of silly and officious neighbors, would cease to take part, as so many parents now do, in killing their own children to such an extent that one-fourth of all the babies born in New Orleans are hurried to the grave during the first year of life. Such parents would better enforce the domestic sanitation, and that home education of children, without which there can be no fundamental and lasting reform in hygiene. And such parents would at least get on the right road to learn, and to teach their children, what actions are physically detrimental, and that all such actions should be shunned as sins, inasmuch as whatever injures health impairs the discharge of all duties.

Other important benefits would also be conferred. The number of citizens deeply impressed with the danger to themselves, would become so large that they would no longer suffer any one to be deterred—as is now often the case—by the threats of ignorant or selfish neighbors, from complaining of the foulest and most unhealthy nuisances. Such citizens would see to it that sanitary ordinances were not simply enacted, but also executed. A sounder public opinion, due to such citizens, would force all doctors promptly to report to the sanitary authorities, as many doctors, to the great injury of the public,

now do not, every case of communicable disease. Sanitarians would be provided with a constituency which could appreciate and would heed their judicious warnings.

The high officials, authorized thereto, would no longer venture, as they now sometimes do, to appoint, as sanitary officers charged with the arduous and responsible duty of guarding the public health, men (medical as well as non-medical) who know nothing about the prevention of disease; who, in fact, are destitute of every claim except that due to personal friendship or political partizanship; and who neither deserve nor receive the public confidence, without which sanitary officers are apt to cause more harm than good. Such appointments would no longer receive the tacit approval of an ignorant and indifferent public. Competent officers would no longer be forced to plead before such a public, that it ought not to hold them responsible for evils which it gives them neither power nor means to correct.

In addition, New Orleans would at last cease to show so unfavorable a balance between its death rate and its birth rate that its increase of population would depend on immigrants from the healthier air of the country; as is also the case with most other large cities, their inhabitants, like ours, still continuing too ignorant to secure to themselves the most important requisite to health,—pure air. Not only would all these benefits be more fully secured with each succeeding generation, but the day would at last dawn here, as it has dawned in England, when any citizen struck down by preventable disease due to another's ignorance or negligence, could recover heavy damages. Eventually, all would understand that disease and premature death are not due to the vindictiveness of God, but are unavoidable penalties for the violation of nature's immutable sanitary laws, which the Creator, who regulates all things with the wondrous order which is "Heaven's first law," should not be expected to set aside, however piteously implored by those who have neglected to learn and to obey these laws.

—Dr. Richardson thinks that "were England converted to temperance, the vitality of the nation would be increased one-third in value, or nearly 227,000 lives would be saved every year."

DECOMPOSING ORGANIC MATTER.*

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[CONCLUDED.]

GERMS.

BUT what do we know about these germs you talk so much about? says one. Is not this all an hypothesis, like the Darwinian theory or the nebular hypothesis, that has now and then a missing link in its chain of evidence? We answer, The connection of germs with the phenomena of decay and disease is something more than an hypothesis. A germ is not an hypothetical thing, like the ether of physical science. Germs have been seen and studied by the aid of powerful microscopes, with the greatest care. Their species, modes of development, favorite habitats, and the conditions essential to their existence, have been worked out with almost as much completeness as the same points with reference to the most common of our higher plants and animals. They play an important rôle in the cycle of existence. Without their agency, the world would soon be covered with the dead but not disorganized carcasses of the millions of animal and vegetable forms which die each instant. It is the function of some of these infinitesimal creatures to reduce back to an inorganic state animal and vegetable forms which have performed their part in the world, and are no longer of service. The moment an animal or a vegetable dies, even before the last agonies are over, these invisible scavengers begin their work, and their labor is carried forward untiringly until completed. This is what we call decay, or decomposition. Without germs, there would be no decay. Seal up a decomposable body hermetically, taking care to exclude every germ, and it will keep as long as the receptacle lasts without the slightest taint. This is what the housewife endeavors to do in the process of fruit-canning. She boils the fruit to destroy the germs it contains, and puts it in the cans while it is yet hot. If the work is well done, it is a success; but if one little germ escapes destruction, the labor is in vain.

* A paper read before the Sanitary Convention held at Greenville, Mich., under the auspices of the State Board of Health and a committee of citizens of Greenville.

These same germs are helpful, as in the raising of bread. In destroying a portion of the starch of the flour, they occasion the evolution of carbonic acid gas, which in rising through the dough makes it light. They are in one sense friendly, since they are the instruments for the removal of a vast amount of dead and useless material which would otherwise soon bury us by its rapid accumulation. Wherever decomposition is taking place, these germs are present in prodigious numbers. One evidence of this is the presence of large numbers of flies in the same localities. The common house-fly subsists largely upon these germs, as well as upon the same kind of food as its micro-



FIG. 1.—BACTERIA OF CARBON.

scopic congeners. Have you ever watched a fly, or hundreds of them, on a summer day, circling round and round, apparently without any particular end in view? I used to wonder why the little creature should spend its time so aimlessly. The reason is readily found. Catch and kill one, if your conscience will permit you, and put it under the microscope. Observe its wings. These filmy objects, when magnified, present a formidable array of spikes and needle points. Here and there among them are some of the very germs which we find in the air, in water, in decomposing matter. Now let us dissect the insect, and examine the contents of its stomach. Here also we find great numbers of these same germs. Now let us watch the little creature again. Here is one which has been soaring about, and now alights, ap-

parently to rest, upon the window-pane. Watch him a moment. Now he is standing on the forward four of his six legs, and

apply to horse-flies, blue-bottle flies, or mosquitoes.)

Germs differ in their relations to human life. Some are innocent, some dangerous under certain conditions, others dangerous under all circumstances; and there are some grounds for believing that those which appear the most innocent, and are such under ordinary circumstances, may, under favorable circumstances, become most formidable enemies to human life and health. For example, Drs. Wood and Formad, of Philadelphia, two experts employed by the National Board of Health to investigate the nature and causes of that deadly disease, diphtheria, after many months of close investigation, have submitted their report on the subject, which has recently been published in full by the Board. From this report it appears that one species of the germs known as *bacteria*, which abound in the air where decomposition is abundant, and which are on this account

almost always to be found in the saliva of the mouth, may, under favorable circumstances, give rise to diphtheria, thus accounting for the frequent spontaneous appearances of the malady. None of



FIG. 2.—MICROBIA OF CHICKEN CHOLERA.

is brushing his wings with the hinder two. He brushes a few seconds, then rubs his feet together, then brushes again, and again rubs his feet, then passes something from one hind foot to the middle one, then to the front foot of the same side, then rubs the two front feet for an instant, brings both feet to his mouth, and repeats the process. Now he is brushing his head in the same way. Do you suppose he is making his toilet? Quite a mistake. The fly is not so fastidious as to spend so much time over his appearance. He is making a meal of germs. He prefers them raw, and takes them alive. He soars around until his wings are loaded, then rests upon some object while he scrapes them together, rolls them into little balls, and makes a meal of them. Every time you see a fly going through such antics, think of germs, and hunt around for the hot-bed where they are propagating. Don't kill the fly, don't catch him in traps, don't cheat him with paper spread with sweetened pitch. Let him live. He is one of our best friends. He is a sanitary sheriff with a commission from the Creator to arrest and devour these agents of disease and death when they get into our dwellings. (This does not



FIG. 3.—ORGANISMS IN INFUSION OF HAY.

us have forgotten the terrible epidemic of this dread disease, which occurred at Ludington, in this State. Ludington is a center for the lumber trade, and a vast

amount of sawdust is produced there. In speaking of the town and the epidemic, Drs. Wood and Formad, in their report, call especial attention to the fact that the third ward of the town, that in which the disease appeared, is built upon a swamp, which has been filled largely with sawdust. "The drainage is so bad that in many places a hole dug a couple of feet in the ground soon fills with water, and only

when wet, very quickly undergoes putrefactive decomposition, the process continuing for years, if the wood is kept moist. While undergoing this process of decay, it swarms with the very same variety of germs, or bacteria, found in the throat in diphtheria, which are undoubtedly given off into the air in great numbers. The same is true of any accumulation of wood exposed to dampness, as wood-piles not



FIG. 4.—MICROSCOPIC LIFE IN WATER. (Hassall.)

[By means of a stereopticon a number of views were thrown upon a screen, which were designed to illustrate the facts presented in the paper, and to impress them upon the minds of the audience.]

in a small percentage of the houses has any attempt been made to construct cellars." In this region diphtheria made its appearance, and spread with such thoroughness that it is said scarcely a child escaped, and about one-third of the children died. In the face of such a terrible fact as this, who will venture to say that decomposing sawdust is not a nuisance, and a dangerous enemy to health?

Some years ago, Dr. Brewer, of New Haven, Conn., made some experiments on the decomposition of wood, many of which we have verified. He found that sawdust,

covered, heaps of chips, wooden sidewalks, pavements, etc.

But we must now come to the practical question, What shall we do with this decomposing matter? Its constant occurrence is unavoidable. How can we so dispose of it as to avoid the dangers which have been no more than hinted at in this paper? This question is not a modern one. It was asked and answered, and correctly, too, more than three thousand years ago. Moses understood the disinfecting properties of earth. The city of Jerusalem was provided with sewers.

Rome, when in its glory, was well provided for in this direction. The same may be said of Carthage, Nineveh, Alexandria, and Herculaneum. During this period no great plagues prevailed, except in consequence of famine and war. During the Dark Ages, this branch of sanitation was neglected, and great plagues occurred, which again and again nearly depopulated whole countries. In modern times a revival of sanitary measures has put a check upon the terrible ravages of cholera and the black death, and we scarcely need fear a repetition of the scourges of the middle centuries of our era.

We have not the time, and this is not a fitting occasion, for a dissertation upon sewerage; nor can we stop to even mention the numerous plans which have been adopted, at different times and in different countries, for disposing of organic matter.

I shall confine myself to the consideration of the best methods for use in a city without sewers, in small towns and villages, and in the country. The disposal of human excreta is the most serious and important part of the problem. How may it be accomplished safely and inexpensively?

First, and most important, we mention disinfection. A disinfectant is a substance which, when brought in contact with decomposing or decomposable matter, destroys its dangerous properties, and thereby renders it innocuous. This is accomplished by the destruction of the germs associated with it, if in a state of decomposition, and by a chemical action upon the decaying substance. All excreta should be disinfected with as little loss of time as possible.

What are the best disinfectants? Dry earth, coal ashes, charcoal, and saturated solutions of the mineral salts, as the sulphates of iron, copper, and zinc, commonly known as copperas, blue vitriol and white vitriol, chloride of zinc, and permanganate of potash or of soda. Each of these has its excellences, but copperas, the cheapest of all, is also one of the best, and will be most often employed on account of its inexpensiveness. Perma-

ganate of potash is particularly serviceable for household use, especially in the sick-room. Its solution has a deep purple color, which disappears as its disinfecting properties are utilized, thus enabling us to assure ourselves as to the completeness of the work, as I will illustrate by a simple experiment.

The jar which I hold in my right hand contains a solution of permanganate of potash, and is, as you observe, of a deep purple color. In my left hand I hold a jar containing a solution of organic matter in a state of decomposition. Now I will add to the contents of this jar a small portion of the purple solution. You observe a slight purple tinge, which quickly disappears as the solution is stirred. As I continue to add portions of the disinfecting solution, the purple color disappears less and less readily until it remains permanently. Now we know that the solution of decaying matter is fully disinfected, and is no longer capable of doing harm. A quantity of this purple permanganate solution ought to be kept on hand in every household ready for use in disinfecting the discharges of diphtheritic and fever patients.

This same agent, by the way, affords a very good means for determining with a tolerable degree of certainty the character of drinking-water with reference to the presence or absence of organic matter. The test solution is very easily made and used. Obtain of any druggist twelve grains of caustic potash and three of permanganate of potash. Dissolve both together in an ounce of distilled or filtered soft water. Add one drop of this solution to a glass of the suspected water. If the color disappears at once, add another, and continue adding until the color remains for half an hour or more. The amount of the solution necessary to secure a permanent color is a very fair index to the quality of the water. If the color imparted by one or two drops disappears at once, the water should be rejected as probably dangerous. I have been looking around your city for specimens of bad water, the presence of which I find there are ample grounds for suspecting on account of the porous nature of your soil, and I was rewarded by finding a specimen which I will exhibit to you. You will notice that as I add the test solution the color disappears rapidly, and a large quantity is required to produce a permanent color. This is very bad water; yet it has been

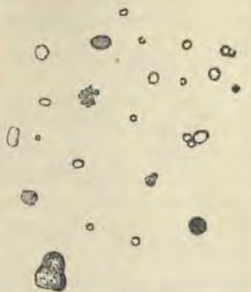


FIG. 5.—GERMS IN ATMOSPHERIC DUST, greatly magnified. (Pasteur.)

very freely used, and we wonder that it has not been the cause of much sickness. It is very possible that many cases of mysterious illness might be fairly attributed to this source. I will not name the source from which this water was obtained, as I have taken pains to see that no further risk shall be incurred; but I would advise each of you to obtain a supply of the test-solution, and examine his own well.

Sulphuric and sulphurous acids, together with nitric and muriatic acids, are also good disinfectants. Chloride of lime, if properly used, is also very cheap and serviceable; but, as commonly employed, it is of no service except to quiet the conscience of the user by producing what might be termed "a sanitary smell." Carbolic acid is also of no value when used in the ordinary way, and to be useful must be employed in such quantities as to make it very expensive. Bromo-chloralum owes its disinfecting properties to the chlorine and bromine which it contains, and is useful if employed in sufficiently large quantities, which its high price is likely to prevent.

How shall we use these disinfectants? We will give a few hints on this point as concisely as possible.

Dry earth and coal ashes are best used in the earth-closets, which may consist of an ordinary closet with a box of earth and a shovel convenient for use, or of a closet to which is attached any one of the numerous mechanical devices for applying the earth or ashes.

The following points must receive special attention: The earth must be dry and fine, and must be used in abundant quantities, sufficient to absorb all the moisture, as it is by this means chiefly that dry earth is useful for this purpose. Coarse sand is of little value. Clay, dried and pulverized, is the best of all materials for this purpose. Charcoal, finely pulverized, is useful when applied in abundant quantity, both as an absorbent, and by means of its oxidating properties. It may be used in the same way as dry earth, and the quantity should be sufficient to absorb all moisture.

Copperas and the other salts mentioned must also be used freely, if any benefit is expected from them. A solution of copperas, containing at least two pounds to the gallon, should be kept on hand for use. At least a pound of copperas, in solution, should be used each day for a

family of ordinary size, or about an equal quantity of blue or white vitriol. When purchased by the quantity, copperas costs but a few cents a pound, and hence may be used freely at small expense.

We need not particularize further respecting the use of other disinfectants, except to remark that in cases of illness from typhoid fever, diphtheria, or any other infectious disease, the discharges of the patient should be received directly into a saturated solution of copperas or sulphate of zinc, or a strong solution of permanganate of potash or soda. White vitriol has the advantage for sick-rooms that it does not stain or discolor garments with which its solution may come in contact.

But what shall we do with decomposing matters after disinfection? They should be removed as speedily as possible to a considerable distance from any human habitation, particular pains being taken to avoid the vicinity of wells or springs. We recommend, above all other plans for use in rural districts and small towns, the earth-closet system in one form or another. A vault cannot be made safe from danger of contaminating the water-supply, unless made water-tight, and then would still be a source of air-contamination, unless a large amount of some good disinfectant were daily employed. If tight at first, it would soon leak, and the disinfection will seldom be attended to.

The dry-earth system is safe, practical, and economical. The great requisite is co-operation. A man may keep his own premises in a scrupulously sanitary condition, and yet be as much endangered through the carelessness of his neighbor as though he were himself equally regardless of the requirements of sanitation. "Thou art thy brother's keeper" applies with all its significance in a sanitary sense.

The dry-earth system has been very largely used in a number of European cities, and somewhat in this country, and its practical success is thoroughly demonstrated.

In the spring of 1875 I introduced this plan into a small city in this State. About one hundred receptacles were put into use. Dry earth and ashes were employed to delay decomposition, and a scavenger engaged to empty the receptacles once a week during the months of April, May, June, September, and Oc-

tober. They were regularly emptied twice a week during July and August, and during the most extreme heat of those months, every other day. The results of this small effort were very gratifying, the usual amount of summer and autumnal sickness from fevers and other zymotic diseases in the section of the city in which the pans were introduced being greatly lessened. The receptacles employed at that time were shallow pans about two feet square and four inches deep, made of heavy sheet-iron, and costing about sixty cents each. It was found that the constant contact of a greater or less quantity of fluid excreta occasioned so rapid corrosion of the iron that the pans were rendered useless after one season's use on account of leakage, so that the system was not continued by all who at first engaged in it, though many provided themselves with galvanized pans, which were more durable, and a few made large tubs by dividing kerosene oil barrels, to which a long stout handle was attached, by means of which they were drawn out to be emptied, and replaced. Four years later, an effort was made in the same community to introduce the "pail-system," most of the pans being worn out, or abandoned for want of appreciation of their value. Though the effort was made quite late in the season, owing to inability to give the matter attention earlier, a large number of pails were introduced. The size of the pail used was 12x15 inches at the top, 9 inches at the bottom, and 10 inches in depth. They were made of heavy galvanized iron, were very strong, and cost fifty cents each with the collar, which is attached to the seat to prevent the scattering of excreta upon the ground. The width of the collar is varied somewhat according to the distance from the seat to the pail, this provision being made to accommodate the plan as much as possible to the form of construction found in most buildings. The pail rests upon a plain board upon which are fastened guides which direct it to the proper position.

The pails are managed upon the same plan as were the pans, and prove in every way much more satisfactory, being more durable, and much more convenient for handling by the scavenger. The expense of this system is very small. The original cost is a mere trifle, and when a hundred pails or more are in use, the expense

for a scavenger was five cents a week for each.

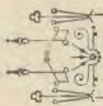
This system has been kept up to a very considerable extent where it was introduced. The great obstacle in the way is the apathy of the people to the necessity of giving attention to this matter.

Another advantage of this system, which we have not mentioned, is the fact that the removal of the excreta is not at all offensive. The work of the scavenger, usually done at night, is in our opinion often the cause of spreading disease. An odor so strong as to awaken one from sleep in the early morning hours is certainly capable of further mischief.

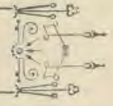
But there are other forms of decomposing matter. What shall be done with the garbage? Combustion is a good means of disposing of such filth, and relieves the scavenger of an additional burden, and the milkman of a temptation to economize. Fire is the most certain of all disinfectants. This plan is not nearly so troublesome as some may think. If not burned, the garbage can be treated in the same manner as excreta. Washwater and dishwater should be carried out, and distributed over the soil several rods from the house. Do away with the cess-pool and the vault, and you will abolish two-thirds of the mortality from typhoid fever, diphtheria, epidemic diarrhea and dysentery, and perhaps a number of other diseases. Abolish cellars under houses, and place the house high enough to allow free ventilation, and thorough and frequent inspection of the area beneath.

Exchange carpets for hard-wood floors, well oiled, and covered, so far as necessary or desirable, with loose rugs which can be daily removed and shaken. Never allow dust to accumulate anywhere in the house. Banish wood-boxes from the living-room. Never paper a wall over another paper. Let in the disinfecting sunbeams and plenty of fresh air to every room daily. Never mind if the carpets do fade; better the carpets than the faces of our wives and little ones. In short, *keep clean*. Keep your premises clean, your dwellings clean, your bodies clean, and your hearts clean, and decomposing organic matter will never do you any harm.

—If you would not be forgotten as soon as you are dead, either write things worth reading, or do things worth writing.



TEMPERANCE AND MISCELLANY.



Devoted to Temperance, Mental and Moral Culture, Social Science,
Natural History, and other interesting Topics.

Conducted by *MRS. E. E. KELLOGG, Superintendent of Hygiene of the National W. C. T. U.*

HOME.

Oh! what is home? That sweet companionship,
Of life the better part;
The happy smile of welcome on the lip,
Upspringing from the heart.

It is the eager clasp of kindly hands,
The long-remembered tone,
The ready sympathy which understands
All feeling by its own.

The rosy cheek of little children pressed
To ours in loving glee;
The presence of our dearest and our best,
No matter where we be.

And, failing this, a prince may homeless live,
Though palace walls are high;
And, having it, a desert shore may give
The joy wealth cannot buy.

Far-reaching as the earth's remotest span,
Wide-spread as ocean foam,
One thought is sacred in the breast of man—
It is the thought of home.

That little word his human fate shall bind
With destinies above,
For there the home of his immortal mind
Is in God's wider love.

—*N. Y. Observer.*

NOTES OF TRAVEL.—No. 1.

BY *MRS. E. E. KELLOGG.*

THE TOWER OF LONDON.

On the northern bank of the Thames, in the very heart of London, stands the famous Tower, which for eight centuries has held a most important place in English history, as a fortress, a palace, or a prison. Indeed, its history is the history of England; and its moldering walls are a monument of her terrible conflicts and weathered storms, her progress from fanaticism and despotism to personal liberty and peace. The Tower is not a single castle, but a series of towers surmounted by a battlemented wall, and encircled formerly by a broad moat filled from the river, but now dry and used as a parade ground for drilling the soldiers quartered in the Tower. Centuries ago, when the present site of London was only marsh and moor, the Romans built here a fastness, of which only a bit of crumbling wall remains to tell the tale; but what is now the Tower of London properly originated with William the Conqueror, who

erected a square fortress with a turret on each of its four corners. Each succeeding monarch, in those tempestuous times, added a wall or a tower, to increase its strength and its size, until the structure covered twelve acres of land, its present extent.

Here, until the time of Elizabeth, the sovereigns of England dwelt in comfortless grandeur, having need to be surrounded by something more secure than royalty to insure their safety; and up to the time of Charles II. the royal court was held in the Tower. These ancient walls, could they speak, might tell of scenes of gorgeous pomp and magnificence, which often gilded the gloomy rooms; of gay tournaments, in which doubtless many of the suits of armor, still preserved in the armory, once glittered and shone on the flower of English nobility and chivalry. It was here on the 29th of May, 1533, that Henry VII. received, with unprecedented magnificence and display, the beautiful Lady Anne Boleyn as his queen; and it was from the Tower she proceeded, upon the following day, with "all the pomp of heraldry and pride of power," to Westminster for her coronation. It was to the Tower, three years afterward, on the first day of the same month, that she returned a prisoner, a discarded wife, her fair fame sullied, her bright career ended, to await in captivity her bloody fate. It was from here, on the 19th of May, that she passed out on her way to the scaffold; and in a vault of the Tower chapel her body lies mingled with the dust.

As a prison, the annals of the Tower are replete with sad and terrible events. A list of the illustrious captives, who, during the past eight centuries, have pined within its chill and gloomy walls, would fill a volume. Through the Traitor's Gate, a strong water-gate built over the moat, hundreds of notorious and royal personages have passed, to exchange dreams of happiness and glory for the dungeon, the torture-room, the block, and the heading-axe. In the White Tower is still shown the cell in which for twelve years Sir Walter Raleigh was confined, on suspicion of having been implicated in a plot to place the Lady Arabella Stuart, a descendant of Henry VII., upon the throne, and where he wrote his famous History of the World. Upon his release, he was sent to Guiana, South America, in search of gold mines; but failing in this, he was remanded to the Tower upon his return, and was beheaded by order of King James, it is said, to please his enemies, the Spaniards, whom Sir Walter, as a warrior, had often defeated.

The walls of Beauchamp Tower, so named, it is supposed, from Thomas Beauchamp, Earl of Warwick, who was imprisoned there during the reign of Richard II., are covered with devices and inscriptions traced by the various prisoners who have been confined there. The majority of these inscriptions are of a religious character, and were doubtless traced by persons immured for their religious belief. One of the most interesting is a device bearing the name of John Dudley, who was imprisoned for having joined the faction which endeavored to deprive Queen Mary of the crown. The device consists of a lion, a bear, and a ragged staff,—his family coat of arms,—underneath which is his name; and the whole is encircled with a wreath of acorns, roses, geraniums, and honeysuckles, emblematic of the Christian names of his four brothers,—Ambrose, Robert, Guilford, and Henry, as appears from the inscription, which is as follows:—

"Yow that these beasts do wel behold, and se,
May deme with ease wherefore here made they be,
Withe borders eke where in,
4 brothers names, who list to serche the ground."

It is evidently intended that the acorns should represent the initial letter of Ambrose; the roses, of Robert; the geraniums, of Guilford; and the honeysuckles, of Henry.

The single word "Jane," imprinted upon the bare wall, stands as a living monument of the beautiful and innocent Lady Jane Grey, whose troublous reign of thirteen days as Queen in the Tower palace changed to weeks of lonely captivity in its gloomy dungeons, and resulted in her execution upon the Tower green.

In one of the towers is shown the broad stone at the foot of the winding stairs under which the bodies of the sons of Edward IV. were secretly buried, after they had been smothered by the command of their cruel uncle.

In another tower close by, guarded by officials and surrounded by strong iron bars, are the royal crowns and jewels, for which so much blood has been shed,—pretty baubles of gold and precious stones, said to be valued at \$15,000,000. Among them is the crown of Edward, one of the first, and that of Queen Victoria, the last. Victoria's crown is a cap of purple velvet inclosed in hoops of silver, the whole surmounted with a ball and cross of jewels, flashing with over 2,700 diamonds, and containing one sapphire worth \$5,000,000, together with rubies and emeralds, each with its legend, as her majesty's crown has been constructed out of the fragments of half a dozen bygone insignia of royalty.

England's sovereigns no longer need to dwell in strongholds, and the Tower is now only used as an arsenal. What was anciently the Council-room, and the scene of the abdication of Richard II., is now filled with specimen suits of armor, some of them dating back as far as the year 1250, together with twenty-two equestrian figures, life-size, clad in the armature worn by the princes and knights of old. These afford a correct picture of English war-array from the time of Edward I. to that of James II. The walls and ceilings are adorned with sunflowers,

passion-flowers, and lilies, formed of sword blades, ramrods, bayonets, and pistols. Numerous trophies are to be seen here. Here, too, are specimens of the instruments of torture, thumb-screws, collars, and heading-axes, which have served to make the Tower a grim monument of the era of cruelty and bloodshed. The block is there, with the axe marks still visible, upon which Lords Lorat, Kilmarnock, and Balmerino were decapitated after the rebellion of 1745.

The warders, sometimes called beef-eaters, a corruption of buffeters, in their picturesque dress, and velvet hat bright with red and blue ribbons, who are stationed in various parts of the buildings, were anciently employed to guard the prisoners and watch the gates.

The whole place is alive with historic reminiscences. Scarce a window, wall, or bridge but has its tale of weal or woe, too often, alas! of woe. And strange as it may seem, it is said that during the eight centuries which the Tower has stood, it has never sustained an attack from a foreign enemy. All the conflicts which have raged around and within its walls have been kindled and fed by the fierce passions and domestic strife of England's own sons.

ST. PAUL'S CATHEDRAL.

ST. PAUL'S is a symbol of Great Britain's ecclesiastical power, and is the grandest structure of its kind in the kingdom. Centuries ago, here stood the celebrated cross of St. Paul's, where the word of God was preached; where papal bulls were published, and noble men whom the flames of martyrdom could not appall, were urged to recant their faith; and where the Pope's condemnation of Luther was proclaimed, in the presence of Cardinal Woolsey. Upon this site two buildings have been leveled to the ground by fire, one of which, usually designated as Old St. Paul's, was the scene of Wycliffe's citation for heresy in 1337, and the burning of Tyndale's New Testament in 1527. The present edifice, which was thirty-five years in building, was designed by Sir Christopher Wren, and completed nearly two hundred years ago. It is an immense structure, built in the form of a cross, with a magnificent nave and transept, five hundred feet in length. One is struck with the vastness of the interior, every niche and corner of which is filled with beautiful statuary, including many extraordinary specimens of art.

In the crypt beneath lie the remains of scores of illustrious dead. All around are statues and monuments of the great in all professions,—the soldier, the statesman, the painter, the poet, and the philosopher. Tombstones form the pavement, upon which we read such names as Sir Joshua Reynolds, Lawrence, Turner, West, and Cornwallis. Here is to be seen the funeral car of the Duke of Wellington, cast from the cannon captured in the victories of the "Iron Duke;" and near by, in a porphyry sarcophagus, lies his body. In another sarcophagus, originally made for Henry VII., lie the remains of Lord Nelson, surrounded by a coffin made from a part of the mainmast of the

ship L'Orient, destroyed at the battle of the Nile. The fact that St. Paul's is the burial place of Wellington and Nelson would serve to make it the Walthalla of England; for Wellington and Nelson are her most beloved heroes.

The guide who conducted us through the crypt asked us to solve the conundrum, "Why is St. Paul's Cathedral like a bird's nest?" and when we gave it up, laughingly answered, "Because it was built by a Wren." This is a fact which we ought to have remembered, since we had just passed a simple, unpretentious slab bearing his name, and the veritable inscription, "Do you seek my monument? Look about you?" And a wonderful monument it is, nearly half a mile in circumference, and costing, it is said, four million dollars. (The larger share of this large sum was raised by a tax on coal.) The height of the dome to the top of the great cross which surmounts it, is four hundred and four feet. Near its apex is the golden gallery, from which, through the fog and mist, one can catch a glimpse of the spires, towers, and roofs of London, far below, looking like the shadowy specter of an immense city. Here, in a tower, is the great bell which is tolled one hundred and twenty times each day at 1. P. M., and whose only other duty is to ring the funeral knell of the members of the royal family, the bishop of London, the dean of St. Paul's, and the mayors of London who die in office. In the interior of the cupola is the "whispering gallery," remarkable for its curious echo. A slight whisper uttered close by the wall on one side is distinctly audible on the other at a distance of one hundred and eight feet.

EXERCISE IN PRONUNCIATION.

An educational journal offers the following as an exercise in pronunciation which is well calculated to test the skill of the most expert performer in this line:—

One enervating morning, just after the rise of the sun, a youth bearing the cognomen of Galileo glided in his gondola over the legendary waters of the lethean Thames. He was accompanied by his allies and coadjutors, the dolorous Pepys and the erudite Cholmondeley,—the most combative aristocrat extant, and an epicurean, who, for learned vagaries and revolting discrepancies of character, would take precedence of the most erudite of all Areopagitic literati.

These sacrilegious *dramatis personæ* were discussing in detail a suggestive and exhaustive address, delivered from the proscenium box of the Calisthenic Lyceum by a notable financier on obligatory hydrophathy, as accessory to the irrevocable and irreparable doctrine of evolution, which had been vehemently panegyrized

by a splenetic professor of acoustics, and simultaneously denounced by a complaisant opponent as an undemonstrated romance of the last decade, amenable to no reasoning, however allopathic, outside of its own lamentable environs.

These peremptory tripartite brethren arrived at Greenwich, wishing to aggrandize themselves by indulging in exemplary relaxation, indicative of implacable detestation of integral tergiversation and exoteric intrigue. They fraternized with a phrenological harlequin who was a connoisseur in mezzotint and falconry. This piquant person was heaping contumely and scathing railery on an amateur in jugular recitative, who held that the Pharaohs of Asia were conversant with his theory that morphine and quinine were exorcists of bronchitis.

Meanwhile, the leisurely Augustine of Cockburn drank from a tortoise-shell wassail-cup to the health of an apotheosized recusant, who was his supererogatory patron, and an assistant recognizance in the immobile nomenclature of interstitial molecular phonics. The contents of the vase proving soporific, a stolid plebeian took from its cerements a heraldic violoncello, and assisted by a plethoric diocesan from Pall Mall, who performed on a sonorous piano-forte, proceeded to wake the clangorous echoes of the Empyrean. They bade the prolix Caucasian gentleman not to misconstrue their inexorable demands, while they dined on acclimated anchovies and apricot truffles, and had for desert a wiseacre's pharmacopœia. Thus the truculent Pythagoreans had a novel repast fit for the gods. On the subsidence of the feast, they alternated between soft languors and isolated scenes of squalor, which followed Mechanist's reconnoissance of the imagery of Uranus, the legend of whose incognito related to a poniard wound in the abdomen received while cutting a swath in the interests of telegraphy and posthumous photography. Meantime, an unctuous orthoepist applied a homœopathic restorative to the retina of an objurgatory spaniel (named Daniel), and tried to perfect the construction of a behemoth which had got mired in a pygmean slough, while listening to the elegiac sougling of the prehistoric wind.

—If you want to see a mean man, find one who never goes out of his way to do a kindness.

Written for GOOD HEALTH.

THE PROBLEM OF THIRST.

BY JULIA COLMAN.

MAN has been called "a thirsty creature," and no doubt a careful investigation would justify the epithet. The consequences of his drinking habits are so serious that to-day they challenge the attention of the civilized world as the greatest curse of the age, and tax the resources of the philanthropist much beyond their limit thus far. The idea has been prevalent that man has a natural craving for stimulants, which it is right to gratify. This idea has long been a stumbling-block to temperance reformers, though many of them have boldly denied the premises. The investigations of Dr. Richardson have proved that alcoholic drinks, so far from being adapted to the human race, "are nauseous when first tasted," and are "none of them fitted to the final natural wants and desires of man." He considers this position so very important that he makes a special point of it in the very first chapter of his "Temperance Lesson Book." He further says: "I gather that said drinks are not wanted at all. If a little child can live, and grow up, and learn, and work, and play, and be very healthy, pretty, strong, and happy without these drinks, a man or woman can live without them equally well." This pretty effectually disposes of the question. It remains, therefore, to ask what we shall drink, and if it is necessary to drink as much as we do.

The correct answer to the first of these questions, is that we take natural drinks, and of these milk and water stand first on the accepted list; "milk for babes," and water for both babes and adults. A large number of people are exceedingly busy in preparing what they call "temperance drinks." We see, especially in the English papers, many advertisements of "zeodone" and "phosphodone," and a great variety of fancy drinks to take the place of alcoholic drinks. Some have strongly advocated the free use of unfermented wine. I have no sympathy with any of these things. I think the idea that any necessity exists for drinking so much is a false one, and should not be nurtured by any such expedients. I am glad to know that we are not taking them up to any great extent in this country, and I hope we never shall.

Many things have contributed to con-

firm me in this position, not the least being a recent statement, on good authority, that ginger ale and some other so-called temperance drinks, have been proved by analysis to contain a very small percentage of alcohol. This is not always the case, but there is a liability to this result whenever the drink contains any amount of sugar which can be fermented. This, of course, is true of all fancy drinks containing fruit juices, unless newly prepared from fresh or canned fruits. This subject is exceedingly suggestive of the necessity of thorough teaching on the nature of the process of fermentation, and its results, with a view to practical application; and perhaps at some future time we may devote a paper to this subject. We pause here, however, to remark the value of fruits and fruit juices in allaying or preventing thirst. It is a tolerably well known prescription for the cure of the drink habit to take an orange in the morning before breakfast. I have myself known this habit to produce some excellent results, in the way of helping those who wished to reform, by making them less thirsty.

We freely acknowledge that thirst is only one element in the temptation, but still it is often a very important element. One of the latest prescriptions I have seen as a drink-cure is to take a copious draught of water every time the thought of drink enters the mind; another is to take a dish of ice-cream. We would suggest an orange, a juicy apple, or other juicy fruit, as better than either, and one which may often be more readily obtained, or may be carried about the person. Indeed, it is often easier in the streets of any great city to get an orange, an apple, or a slice of pine-apple, than a drink of water; and I wish I could add, easier than to get a drink of beer. Temperance people would be doing good, practical work if they would encourage the erection of fruit-stands in destitute localities, seeing to it that they also keep cool water, and perhaps lemonade. Women would do well to see that their "men folks," when away from home, are supplied for the day with juicy fruit if practicable, or with cold tea, though that is much less desirable.

Another thing women could often do, but I am afraid they seldom think of it; they could provide food that is not thirst-provoking. How often it happens that women who send out their loved ones

with an agony of prayer that they may be kept for the day, also send them with a breakfast that will make them almost frantic with thirst before they get to the first tavern; while it is very likely that no thought has been given either to the cause of the thirst or to the means for assuaging it. It is a very easy matter to speak as the little boy did to his father who came home, after passing through such an ordeal, with the confession that he had broken his pledge, and taken a drink of cider, not being able to get any water. "Father," said the boy, "how far were you from James River when you drank that cider?"

"Fifteen miles, my boy."

"Well, father, I would have walked all that fifteen miles to James River before I would have broken my pledge."

The boy, whoever he was, has been made a hero for that reply; but very possibly had he been with his father, and felt the thirst, intensified by the expectation of an immediate drink of water which he could not get, and especially if his mind were preoccupied by business, he might have done just as his father did, and taken a drink of cider, which was no doubt paraded with assurances of its harmless character. Of course, if the matter had been thoroughly canvassed, and heroism called up, the ordeal might have been passed in safety, with only the torture of thirst, which is, however, even more exhausting than hunger. Now, please understand, I *do* believe in every-day heroism, and I do *not* intend to excuse the cider-drinking. But why should we make an extra demand for heroism on the part of the men and boys to meet conditions which we have wholly or partly imposed on them by our own lack of the exercise of common sense?

For example, what was the breakfast referred to above? Fried ham, salt mackerel, codfish balls, fried potato, fried hominy,—some of these things no doubt; at all events there was salt, salt everywhere, and no fruits nor cooling fruit acids. And salt provokes thirst. I see you are not informed on the salt question. The brewers and saloon-keepers understand it; let us take a leaf or two from their books. It is a common thing for them to salt their ale or beer to provoke instead of satisfying the thirst of those who use it. Then comes the free-lunch device,—salt biscuit, salt fish, and *pretzels*, which are German bread dough-nuts,

very salt, and sprinkled with salt, made to go with the beer to create thirst. And you who wish to do just the opposite—you go and do the same thing; that is, you give them extra salt food, and send them out praying God to keep them from drinking beer! I believe in prayer, but I believe in common sense too; and if you use common sense, and give less salt, your prayers will be more likely to be answered. Or, to put it in another shape, if God will give you eyes to see how you can make your loved ones less thirsty, that will be one way of answering your prayers, will it not?

Suppose we should find out, as one of the results of all this agitation about the drink question, that our habits of eating, or rather of seasoning, have the effect to make everybody more thirsty, more likely to drink, and less capable of resisting temptation; do you think it would be worth your while to act upon it, and use less salt and other thirst-producing condiments? The saloon-keepers think it worth while to act upon that fact; shall we use less common sense than they do? The question has been seriously asked whether eating potatoes might not make the Irish people drink more whisky. You and I may not be profound enough to see how these two things can be cause and effect; but we can see how eating salt makes men thirsty, and more likely to drink beer, or any other drink that is put in their way; and if we are wise, we shall press that fact into service, and so by solving the problem of thirst, we shall be better able to solve the entire drink problem.

Now, if I were talking with you, I know just what some of you would say, "Why, I use a great deal of salt, and I never drink. I have a brother who eats salt on everything,—even spreads it upon his bread and butter; yet he does not drink." Well, that is not saying that your eating salt does not make you more thirsty than you would be without it, and more likely to drink something,—beer, if your principles did not forbid beer. Or perhaps you will say that your John is just as likely to drink one day as another, whether he has a salt breakfast or not. Perhaps you have not observed about that, or if you have, there is another fact you may not understand. Salt is a thing that is not easily washed out of the system. The man has in his system not only some of the salt that he ate with his

breakfast this morning, but some that was eaten yesterday, last week, and probably last month too. The system is constantly throwing it out in various ways, even by the tears and perspiration. Observe how salt they are. You need to drink more every day to dissolve and wash away the salt than you would if you had not taken the salt.

Some say, "All the animals eat salt, and therefore we should." This is about as true as if I should say, All the animals eat grass, and therefore we should. Others will say, "Well, I could not get along without salt." I am not asking you to do so; but I might very appropriately ask, in view of all the facts adduced, if you could not use *less* salt in cooking, and especially if you could not contrive also to supply your tempted ones with more fruits and cooling drinks, giving them better habits of eating. Much rests in the hands of women in this matter; and if we can learn more, and apply more science to the solution of this drink problem, we shall be more likely to keep the ground that we gain by other branches of our temperance work. And this whole salt question is well worthy of an examination.

SCOWLING.

WE print the following, taken from some paper, for the benefit of all whom it may concern. It affords a mirror in which we may perhaps see ourselves as others see us:—

Don't scowl; it spoils faces. Before you know it your forehead will resemble a small railroad map. There is a Grand Trunk line now from your cowlick to the bridge of your nose, intersected by parallel lines running east and west, with curves arching your eyebrows; and oh, how much older you look for it! Scowling is a habit that steals upon us unawares. We frown when the light is too strong, and when it is too weak. We tie our brows into a knot when we are thinking, and knit them even more tightly when we cannot think. There is no denying that there are plenty of things to scowl about. The baby in the cradle frowns when something fails to suit. "Constitution scowl," we say. The little toddler who likes sugar on his bread and butter tells his trouble in the same way when you leave the sugar off. "Cross" we say about the children, and "worried to

death" about the grown folks, and as for ourselves, "we can't help it." But we must. Its reflex influence makes others unhappy; for face answereth unto face in life as well as in water. It belies our religion. We should possess our souls in such peace that it will reflect itself in placid countenances. If your forehead is rigid with wrinkles before forty, what will it be at seventy?

There is one consoling thought about these marks of time and trouble—the death angel always erases them. Even the extremely aged, in death often wear a smooth and peaceful brow, thus leaving our last memories of them calm and tranquil. But our business is with life. Scowling is a kind of silent scolding. It shows that our souls need sweetening. For pity's sake let us take a sad-iron, or a glad-iron, or a smoothing tool of some sort, and straighten those creases out of our faces before they become indelibly engraved upon our visage!

SOMETHING ABOUT CORKS.

THE tree from which cork is obtained is a species of oak, which grows plentifully in the south of France, Spain, Algeria, and some parts of Italy; but it is from the Atlantic side of France and from Portugal that we obtain the larger part of our supply. The tree is rather handsome in appearance, more so, indeed than the oak, when full-grown. It appears to be designed specially to supply its valuable bark; for the wood is of little value for building purposes, although it is in fair demand for fuel. When it is twenty years old, or thereabouts, it periodically throws off its bark, after it has grown of prodigious thickness, and then it begins to form a new covering. It has been found best, however, not to let the tree have its own way, for the bark thrown off is not quite satisfactory. Nature needs a little help, and the bark is artificially removed by the following process:—

In the months of July and August, when the sap flows plentifully, a circular incision is first made a few inches above the surface of the ground, then a similar circular cut round the trunk immediately under the main branches, care being taken not to penetrate the inner bark. The part intervening between the two cuts is then slit down longitudinally in three or four places, which divides the bark into broad sheets. The tree is now left for a

time, so that the moisture from the sap may dry. The bark is then taken from the stem, more or less curved, according to the breadth and diameter of the trees from which it has been taken. The instrument used for cutting and removing the bark from the stem is a sort of an axe, the handle of which is flattened into a wedge-like shape at the extremity, which serves to raise the bark. The bark grows again; and as this tree lives, according to Dr. Hamel, a hundred and fifty years or more, its disbarking takes place every eight, nine, or ten years, the quality of the bark improving with the increasing age of the tree, which is not in the slightest degree injured by the process. At the first and second gatherings, the bark is fit only for floats for fishermen's nets and other inferior uses; it is not until the third disbarking that the substance has attained the desired perfection for the manufacture of corks. The sheets, layers, or tables of cork, as they are called, are now scraped on the outer surface to remove the coarser parts of the epidermis and any epiphytes or other extraneous substance. They are then thrown into deep pits, and covered with water to soften them in order to be flattened by pressure under heavy stones, after which they are dried over a fire, being frequently turned during the process to prevent their returning to their original shape.—*Sel.*

Neither Ill nor Thirsty.—A man of temperance habits was once dining at the house of a free drinker. No sooner was the cloth removed from the dinner table than wine and spirits were set out.

He was invited to take a glass of wine.

"No, I thank you," said he, "I am not ill."

"Take a glass of ale."

"No, I thank you," said he, "I am not thirsty."

The answer produced a loud burst of laughter.

Soon after this the temperance man took a piece of bread from the sideboard and handed it to his host, who refused it, saying he was not hungry. At this the temperance man laughed in his turn.

"Surely," said he, "I have as much reason for laughing at you for not eating when you are not hungry as you have to laugh at me for declining medicine when not ill, and drink when not thirsty."

Be Social at Home.—Let parents talk much and talk well at home. A father who is habitually silent in his own house may be in many respects a wise man, but he is not wise in his silence. We sometimes see parents who are the life of every company they enter dull, silent, uninteresting at home among their children. If they have not mental activity and mental stores sufficient for both, let them first provide for their own household. Ireland exports beef and wheat, and lives on potatoes; and they fare as poorly who reserve their social charm for companions abroad, and keep their dullness for home consumption. It is better to instruct children and make them happy at home than it is to charm strangers or amuse friends. A silent house is a dull place for young people,—a place from which they will escape if they can. They will talk or think of their being "shut up" there; and the youth who does not love his home is in danger.—*Sel.*

POPULAR SCIENCE.

—The yield of petroleum in the California fields is 300 bbls. daily.

—A windmill has been invented by a foreigner, Mr. L. Purper, which eclipses all previous attempts in this direction.

—An unsuccessful attempt to cross the Channel, from the Kentish coast to France, in a balloon, was recently made. The aerial voyagers, Colonel Brine, R. E., and Mr. Joseph Simmons, a professional balloonist, came down into the sea, but were picked up by one of the Calais and Dover steamboats.

A Large Tumor.—At the Hospital of the University of Pennsylvania, February 10, Dr. William Goodall removed an ovarian tumor weighing 112 pounds. The patient, 31 years of age, weighed only 75 pounds after the operation. The doctor naively remarked that he had taken the woman from the tumor. There was a fair prospect that the patient would survive the operation.

An Evolutionist Discovery.—Prof. Cope, a prominent American naturalist and evolutionist, has discovered the fossil remains of a new beast, to which he has given the euphonious title *Anaptomorphus Monunculus*, and which, he remarks, "is nearer the hypothetical lemurid ancestor of man than any yet discovered." The animal was about the size of a marmoset. A very remarkable creature indeed to be the ancestor of the human race. "Great is the mystery of" Darwinism.

To Bore Holes in Porcelain.—It is sometimes necessary to bore one or more holes in porcelain, but the usual way of doing this is not easy. If, however, an ordinary drill be hardened, and kept moist with the oil of turpentine, it will easily penetrate the porcelain. The drill commonly employed in connection with scroll-cutting machines answers very well.

A Curious Fact.—Says an Exchange: "A writer mentions a peculiarity of newly tempered circular saws, which, when laid down to cool, commence to hum, and if not quickly replaced in the furnace will crack. The humming begins in a low musical key, and rises in tone until it ends in a snap. The saw does not always crack through from the eye to the perimeter, and it never does so if it is got into the furnace while humming in a low tone. If the crack proceeds but a part of the way, it is from the bottom of a tooth or space and toward the eye. Saw-makers do not seem to be able to explain this singular and costly phenomenon."

This fact may be new to the mechanics, but it certainly is not new to physicists. The humming of the metallic plate is due to the unequal conduction of the heat from it by the irregular and poorly conducting surface with which it is placed in contact.

Fishing by Electricity.—The latest use to which electricity has been put is as an aid to fishermen on the coast of France. The apparatus consists of a glass globe, within which the electric light is shown. Two conductors, encased in gutta-percha, are so arranged as to meet inside the globe, and produce the light under water. The globe is attached to a weight and a float above, and can be lowered to any desired depth; as soon as the carbons begin to flash, the sea in the vicinity is lighted, and all kinds of fish swarm around the globe. It is well-known that light has a strong influence upon fish at night. They seem to be charmed and confused by it. As soon as the globe has drawn around it a great number of the inhabitants of the deep, the fishermen approach in boats, and scoop up the fish in their nets. Some object to this style of fishing, and say the fish will be cleaned out in a short time if it is carried on to any extent.—*Sel.*

Soaps.—Scientific investigations have recently shown that potash soap is greatly superior to soda soap. "Potash more naturally assimilates with all animal and vegetable substances than soda. A very notable instance of this is wool. In its natural state, growing on the sheep, it is lubricated and preserved with a kind of fatty compound, consisting of carbonate of potash and grease—no soda being present. Now the teaching of nature in these matters is always correct; therefore it is evident that potash should be used instead of soda in the subsequent treatment of wool, in preparing it for spinning and weaving. This is found actually to be the case, as a wool washed, and the cloth or goods subsequently made from it 'fulled,' with a pure neutral potash soap, have a softness of handle and a smoothness and silkiness of touch that are in very marked contrast to the same wool washed, and the goods made from it prepared, with a soda soap. This fact is now beginning to be more generally understood by woolen and worsted manufacturers, who use potash soaps in preparing the wool for spinning, and the subsequent finishing of all fine

woolen goods. Even in preparing cotton goods, potash soap is now much more used, although the advantages are not so marked as in the case of woolen fabrics.

"Potash soap is far more soluble than soda soap. For this reason, it will wash just as well with cold water as with hot; and it is at the same time more penetrating, therefore it finds its way into the interstices of any article which is washed with it, removing the dirt with much less labor or scrubbing, and also much more quickly."

A New Variety of Glass.—A Vienna chemist has recently discovered a new variety of glass. It does not contain any silica, boric acid, potash, soda, lime, or lead, and is likely to attract the attention of all professional persons on account of its peculiar composition. Externally, it is exactly similar to glass, but its luster is higher, and it has a greater refraction. It is of equal hardness, perfectly white, clear, and transparent, and can be ground and polished; it is completely insoluble in water, is neutral, is only attacked by hydrochloric or nitric acid, and is not affected by hydrofluoric acid. It is easily fusible in the flame of a candle, and can be made of any color. Its most important property is that it can be readily fused on to zinc, brass, and iron. It can also be used for the glazing of articles of glass and porcelain. As hydrofluoric acid has no effect on the new glass, it is likely to find employment for many technical purposes.—*Sel.*

St. Vitus's Dance and Sensitive Plants.

We have constantly new illustrations of the identity in structure between plants and animals, and the close analogy, sometimes amounting to identity, in the life-history of the two. One of the latest attempts in the direction is that of Dr. Warner, the lecturer on botany at the London Hospital, who essays to show that the movements of sensitive plants are analogous to those so-called nervous movements more or less unconsciously and unwittingly made by unhealthy children.

The following note is taken from the *British Medical Journal*: "Those planted in a soil of two parts of decayed vegetable mold to one of sand, grew more vigorously both in height and foliage than the others; and after two months' growth they were much less sensitive than others planted in two-thirds of silver-sand and only one-third of leaf-mold. One or two plants were grown entirely in silver-sand. These showed extreme sensitiveness to the slightest touch; even a breath of air, or the slightest jerk of the pot in which they grew, caused all the foliage to shut up. Those plants having no nourishment beyond the gases in the air or sand soon turned yellow, and died. The plants in two-thirds sand and one-third decayed vegetable mold were not so robust or strong as those grown in a greater proportion of vegetable mold. They failed to produce any flowers, and died off at the lowest temperature to which all the plants were exposed; while those planted in two-thirds vegetable mold and one-third sand fully matured their growth, flowering in a temperature of 50° or 60°, the foliage being of that full green color denoting the fact that the spongioles of the roots had necessarily been supplied with the various chemical gases in the soil (set free by a due amount of moisture) requisite for producing the continued support of the plants."—*Gardener's Chronicle.*

GOOD HEALTH.

BATTLE CREEK, MICH., MAY, 1883.

J. H. KELLOGG, M. D., EDITOR.

TERMS, \$1.00 A YEAR.

CROSSING THE OCEAN.

HAVING been granted leave or absence for a few weeks by the indulgent Board of Directors in charge of the Sanitarium, an institution which has for a number of years occupied our almost undivided attention, we gladly embraced the opportunity to make a long-contemplated visit to Europe. Our object is not only to recuperate our physical and mental powers, which have been somewhat overtaxed, but also to gain valuable information by the aid of which to enlarge the usefulness of the institution for whose upbuilding we have been earnestly laboring during the years we have been connected with it. We felt great reluctance to leave our many friends at the Sanitarium, especially the several scores of invalids in whose cases we have taken a deep interest on account of the gravity of their maladies, and the special effort required to secure to them the long-sought boon of health. Urged by numerous friends, prompted by a sense of duty to ourself and others, and encouraged by numerous favoring circumstances, we however decided to tear away from the many agreeable and endearing associations which have made our duties in connection with the Sanitarium pleasant, and our busy life a happy one, though these duties have often been most arduous, and have taxed our powers of endurance to the utmost. If we had ever been tempted to believe that real friends were few and genuine friendship rare, we certainly should have been undeceived at the hour when we said "Farewell" to our one hundred co-workers at the Sanitarium, and our much more numerous family of patients. The hearty handshakes and earnest wishes for a safe return, with now and then a tearful eye, assured us that, whether deserving or not, we held a larger place in the hearts of our friends and patients than we should have dared allow ourself to believe.

Leaving home on the evening of Feb. 11, accompanied by Mrs. and Miss K., we reached New York after a somewhat tedious journey,

due to the fact that our train was so far behind-hand as to miss connections all the way; but we were in ample time for our steamer, which, on account of a late arrival, did not sail until two days after the appointed time.

Having got fairly away from our work, we realized more fully than we could before, the fact that the time had come when we needed a respite from work and care. Though admonished of this fact by numerous friends, we had scarcely allowed ourself to give credence to such a notion, and hence were not really prepared for the sensation of utter good-for-nothingness which completely overwhelmed us when we felt that we had nothing to do but rest and recuperate. It was fortunate indeed that we had a day or two to spare in New York, or we should hardly have had ambition to drag ourself on board the steamer. On the day appointed for sailing, however, and an hour or two before the time announced, we were safely settled on board, in the most comfortable quarters our good ship afforded, which had been kindly reserved for us by the managers of the Monarch Steam-Ship Line, with whom we had arranged for passage before leaving home. The hour for sailing arrived, and our ship was still held fast to the wharf by the immense ropes which kept her in position while loading her cargo. Upon making inquiry as to the cause of delay, we found that although the cabin and steerage passengers—the latter comprising twenty-five Russian Jews, exiles returning to their native land—were all safely settled on board, a large number of other passengers were yet to be received; and on looking over the other side of the vessel, we found that a huge cattle boat had come alongside, and was transferring its cargo of several hundred cattle and sheep to our vessel from a door in its side opening from the lower deck. After waiting patiently for several hours, the last horned passenger was safely lodged on board, with the exception of one refractory creature that leaped overboard, determined not to leave his native land. Attempts

were made to capture the fugitive by a lasso, but without success, and as we steamed away, it was still to be seen paddling about among the cakes of ice in the harbor. We learned afterward that it was helped out by some stevedores who were watching it from the wharf; but we had little interest in the rescue, as we had quite as soon it should die by the hand of nature as by the butcher's knife in the *abattoir*.

Sailing out a few miles, we found ourselves too late for the tide, and so were obliged to cast anchor but a short distance from Staten Island, near one of the government forts by which the entrance to the metropolis is guarded. We retired early to bed, and enjoyed a good night's sleep. On awakening the next morning, we found that the incoming tide having secured the necessary depth of water to carry our large vessel over the "bars," we had been several hours under way, and were rapidly making out to sea, the land being even then quite invisible on account of a dense fog which had settled down upon us.

At breakfast we found that our little party comprised more than a fourth of the entire number of cabin passengers; so we had plenty of room, and a good prospect of not suffering for lack of sufficient attention from the kind stewardess and gentlemanly waiters and porters. Finding ourselves fairly out at sea, the gloomy prospect of seasickness, the great bane of ocean travel, began to rise in our imagination, especially when we gathered from some of the officers that the last voyage had been an exceedingly stormy one, and that all of the passengers were seasick most of the way. We do not recommend people to anticipate trouble of this sort, as such a condition of the mind is sure to produce the corresponding physical condition in the body; but we had for several weeks before leaving home suffered so much from vertigo, the result of excessive nervous taxation, that we felt morally certain that we should not escape being obliged to do homage to old Neptune; for if we were already almost seasick on shore, why should we not be quite so when at sea? So we felt that we might as well "prepare for the worst," although we did, to the best of our ability, endeavor to "hope for the best." Fortunately, the first few days were unusually pleasant. It seemed that the storm which had been raging for two or three weeks continuously, had just spent itself, and tired old Ocean was quietly resting preparatory to a new exhibition of his fury. After a few days, however, when about in mid-ocean, we had one or two days of stormy weather, not sufficiently rough to involve any danger, but quite sufficient

to give us a clear conception of what the angry waters are capable of doing when Neptune's ire happens to be aroused to a high pitch. So long as we were able to keep on deck, we experienced no symptoms of seasickness, although our good ship rolled and tumbled among the waves so violently as to make it necessary to cling firmly to some stationary object to prevent being dashed overboard when on deck. The waves finally rose so high that the highest of them dashed over the upper deck, making it impossible to remain there even though fairly well protected by a water-proof suit, with which we had taken the precaution to provide ourself. After being submerged a few times, we reluctantly yielded to the force of circumstances, and joined our seasick companions below. We found most of the passengers were in their berths, and the remainder were lying about, each with a cuspidor conveniently near, which was frequently called into requisition.

Scarcely had we entered the stagnant, odoriferous atmosphere below, when the conviction forced itself upon us that our time had come, and for two or three hours we resigned ourselves to that utter wretchedness which can be appreciated by no one who has never "enjoyed" the experience of seasickness. We say "enjoyed," because our kind stewardess constantly assured us that "it would do us a world of good," and that by relieving our stomachs of the bile which had undoubtedly accumulated there, we would realize such wonderful advantages, health-wise, as would make us anxious to undergo the same experience again as a therapeutic measure. We were reminded of the story of the colored gentleman, who, on going to sleep with his feet too near the fire-place, awakened to find that he had seriously burned one of his great toes. When offered sympathy by one of his friends, he assured him that he was not in need of it, as he always enjoyed an accident of that kind, because he felt so much better when he got well. We can readily imagine that the enforced abstinence and thorough evacuation of the digestive canal occasioned by a vigorous attack of seasickness, may be of service to persons whose dietetic habits have been such that a house-cleaning process of this character, with rest for the tired organs, is required; but it was difficult for us to understand how persons whose dietetic habits have been scrupulously frugal and abstemious for years, could derive any advantage from such a stirring-up.

We were of course glad to improve the opportunity for practical study of the causes and cure of this troublesome malady, and we were not long in arriving at the conclusion that in our

own case, at least, the horrible nausea which settled down upon us like a nightmare immediately upon leaving the upper deck, was fairly attributable to nothing else than the foul air of the cabins. When the weather was fair, so that the port-holes and gangways could be freely opened, this was less observable; but as soon as the dashing of the waves over the ship necessitated the closure of the usual avenues for the entrance of fresh air, the intensity of the odor increased to such a degree that it became absolutely intolerable. We could not induce our kind stewardess to indorse this view, however, although she admitted that persons suffering with seasickness were always at once made comfortable when they could be upon the deck. She constantly assured us that the "ship odor" was extremely tonic in its properties, and that "we would find it very strengthenin' when we became accustomed to it." We assured her that although it was quite apparent that the odor was "strong" enough, we did not care to have any of that kind of strength imparted to us. Fortunately for us, at least, all of the other passengers of the ship left the Ladies' Cabin unoccupied, and we were allowed to take full possession for a day or two, until the worst of the storm was past; and as it was located on deck, on the protected side, we were able to get an abundance of fresh air, although it brought with it an abundance of cold, and this was not antagonized by a sufficient amount of caloric, the steam being scrupulously hoarded for the benefit of the huge engines which were driving us on our way. We felt certain at the time that had we been confined below, we could not have survived the ordeal, not of the storm, but of the stench.

There is certainly a great chance for improvement in the ventilation of ocean steamers. One very singular fact we observed; namely, that while the necessity for securing a supply of fresh air to human beings on board the ship is very little recognized, the necessity for an abundant supply of air to the furnaces is not only recognized, but satisfied by the provision of immense ventilating shafts in adequate numbers to secure to the furnace and the firemen a plentiful supply of fresh air. Even the quarters in which the cattle and sheep were kept, were supplied with means to secure ample ventilation; but we were unable to discover anything of this sort in the cabins. We do not wish it to be supposed that the good Grecian Monarch, on which we crossed the ocean, is worse in this respect than other vessels. It is a new vessel, and undoubtedly comprises in its numerous arrangements for the convenience of passengers

the best appliances for obtaining fresh air which are in use by ship-builders. From the examinations which we have made of various steamships, we believe the fault to be a general one; and while it would, perhaps, be too much to say that foul air is the sole cause of seasickness, we believe it to be the chief cause in the great majority of cases, and have not the slightest doubt that the introduction of proper arrangements for supplying an abundance of fresh air to passengers during stormy weather would do more than any other one thing to abolish the greatest inconvenience of ocean travel.

With the exception of the two or three days of stormy weather to which we have referred, the weather during the whole voyage was remarkably pleasant. Several of the ship officers assured us that a summer voyage is seldom as agreeable in all respects as was this one in the month of February. The gentle southern breeze kept the atmosphere so moderate that passengers could be on deck every day without discomfort. Not a single day passed without bringing into view several ships or ocean steamers. One day about noon, quite unexpectedly, a huge whale made his appearance a short distance from the ship. Although traveling in a direction opposite that of the ship's course, its spoutings were visible for some time. Frequently schools of porpoises were encountered, and afforded much amusement to the passengers by their strange antics as they gambled in and out of the water, sometimes turning almost complete somersets in the air, and playfully leaping over one another several feet above the water.

On the evening of the thirteenth day, the light from the first light-house on the English coast was discovered, and a few hours later we were sailing up the English Channel toward our destination, the metropolis of the world. The next morning a Trinity House pilot came on board, and by twelve o'clock our good ship cast anchor in the Thames opposite Gravesend. After three or four hours vexatious delay, the custom-house officers came on board to inspect our baggage. The inspection consisted chiefly in asking us if our trunks contained "any cigars, tobacco, or whisky, or reprints of English books," to all of which questions we were able to give an honest negative, although the officer felt inclined to confiscate a copy of an American magazine, which is published simultaneously in New York and London. The inspection being completed, a wharf-boat carried us to the shore; and an hour later we found ourselves safely and comfortably settled, to our great satisfaction, at an excellent hotel in Charing Cross, the very

center of the great city. We remained here, however, but a day or two, until we could find apartments in a more salubrious and quiet portion of the city, which we were very fortunate in securing exactly to our liking, in a portion of London known as South Kensington, which is world famous for its immense parks, scarcely surpassed anywhere for natural or artificial beauty. Having made such arrangements with our landlady as enabled us to secure the hygienic dietary to which we had so long been accustomed, we found ourselves feeling perfectly at home at once, and prepared to appreciate the comfort of dwelling upon land once more.

Next month we will endeavor to tell our readers something about London from a hygienic point of view.

THE MALARIAL GERM.

SEVERAL German and Italian savants have recently been studying the cause of malarial diseases, and the results of their investigations point very clearly to a minute organism as the exciting cause of the phenomena of malarial affections. It has long been believed that malaria is a germ disease, but conclusive evidence in support of the theory has been wanting till the present time. The investigations made were conducted with such care, and have been so extensive in their character, that it is probably safe to believe that the evidence is now complete. The minute vegetable organism which occasions the disease seems to develop in the blood corpuscle, which it first destroys, and then escapes into the serum of the blood.

It is observed that the organisms do not propagate readily at a high temperature, which accounts for the fact that malarial diseases are most prevalent when a period of cold, damp weather follows a season of heat and dryness. The name given to this newly discovered enemy of human life is *oscilaria malarie*.

Dr. Smith, the eminent professor of diseases of children, holds that there are two kinds of malaria,—marsh-malaria and sewer-gas malaria. It is possible that further investigation will show that the two classes of cases so closely allied in character are due to germs of a kindred nature.

DIPHTHERIA AND DIRT.

SOME time ago an outbreak of diphtheria occurred in a family living in an isolated place in which no previous case of the disease had occurred, and which was so secluded that little or no communication was held with other places. The three children of the family who suffered with the disease, had not been from home for several weeks, nor had the house been visited by any person afflicted with the disease. The chances for communication of the malady by some one suffering with it were, indeed, so slight that this could not be fairly regarded as the cause. Careful investigation of the premises, however, showed adequate cause for the disease close at hand. That common trio almost universally to be found in country homes—the cess-pool, the privy-vault, and the well—were in this instance located within three feet of one another. The porous character of the soil, a gravelly loam, gave to this vicious circle the opportunity for exerting to the fullest extent its pernicious influence; hence, the outbreak of diphtheria in a malignant form which came near sacrificing the lives of the three younger members of the family.

Instances of this kind are becoming so common that it seems to us it can be no longer doubted that diphtheria, although a contagious and infectious disease, may arise spontaneously from bad sanitary conditions.

ANOTHER WARNING TO DRUNKARDS.

THE paragraph which we give below we clipped from a newspaper, and cannot vouch for its accuracy; but if true, it is another warning of the danger from drinking, especially to those peripatetic drunkards who imagine that the use of alcohol is necessary in tropical countries to counteract the effects of excessive heat, and malaria.

“An English paper tells this tough story from British Guiana. In that country, it says, an inexperienced traveler, having, as is the custom in tropical countries, taken a refreshing draught from the

stem of one of the many water-holding plants which thrive in the forests, modified his cold refreshment by a 'nip' of rum. Shortly afterward he died in excruciating agony, and a post-mortem examination showed that his internal organs were literally sealed up with India rubber. He had imbibed the sap of the *nimusops balata*, the juice of which coagulates and hardens in alcohol, and the rum had its usual effect in the poor man's stomach, with necessarily fatal results."

Probably an old toper would prefer incurring the liability of an ague fit to lining his insides with a layer of India rubber; but the fact is, every spirit-drinker runs the risk of converting his stomach and liver, and, in fact, nearly all of his internal arrangements, into a sort of material of little greater utility than India rubber, through the degenerating process which almost invariably follows the long-continued use of alcoholic drinks, even in moderate doses.

THE DIFFICULTY OF PREVENTING FOOD ADULTERATION.

PROFESSOR CHANDLER, a member of a committee appointed by the New York Legislature to look after the matter of food adulteration, mentions the following as some of the difficulties attending the work of the committee:—

"Most of the persons or corporations which practice adulteration upon a large scale are rich, and will fight the matter in the courts, employing experts of their own who will swear up and down that alum is rather beneficial to bread than otherwise, that diseased pork makes better lard than healthy pork, and that children cry only for candy which is half white earth, and converts their stomachs into miniature pottery establishments.

"We shall now be able to say where this adulteration shall stop. In the matter of milk, we were able to fine dealers who sold watered milk, but we were not able to prevent the sale of much milk which, though no better than watered stuff, was honest milk from wretched

cows, and was poor in every way. If we adopted a standard for our milk, we should have to make it so low in order to include the milk from the skin and bone sieves called by courtesy cows, into which the milkman pours water, and not much of anything in the way of food, that really good milk would have no chance in the competition. But now we can fix a standard without reference to these accommodating animals, and say that no milk not containing a certain amount of cream shall be sold. If a man's cows do not give milk of the requisite quality, so much the worse for him; he should sell his cows and buy better ones."

SMOKERS IN COURT.

WE are glad to see such influential papers as the *Independent* and the *New York Tribune* speaking out so emphatically on the question of tobacco-using. It will be time enough for Americans to boast of their advanced civilization when the nation has been rid of this barbarous habit.

"The *Tribune*, in very plain English, it will be seen below, sustains Justice Morgan in defending the rights of men, women, and children who do not wish to breathe the vile atmosphere of the cigar smokers, who persist in annoying those traveling on our street cars. There are others, designated by the *Tribune* as '*selfish brutes*,' who do not actually smoke inside the cars of our city, but who insist on 'carrying lighted cigars and cigarettes, whose offensive fumes rapidly convert the atmosphere into that of a smoking-room.' Let those who desire to indulge themselves in this disgusting habit be compelled to have a private 'smoke-hole' of their own, where travelers in cars and other public places will not be annoyed. There are a very few real gentlemen who now indulge in smoking in our streets and in other public places, as it is generally considered very impolite and unrefined thus to do, especially in the thronged thoroughfares of Broadway, Fifth Avenue, and other crowded places.

We should be glad to see the press generally imitate the example of the *Tribune* in dealing with public smokers. It says:—

“The rights of non-smokers were very properly vindicated by the arrest of two disorderly passengers who persisted in smoking in a One Hundred and Twenty-fifth Street cross-town car on Monday night. From this some encouragement can be derived by our wayfaring citizens, their wives, and daughters, and the strangers within our gates. It is one of the serious annoyances of street-car travel, that selfish brutes insist upon smoking where smoking is not allowed, or upon carrying lighted cigars and cigarettes whose offensive fumes rapidly convert the atmosphere into that of a smoking-room. The management of the elevated roads took a step worthy of commendation in forbidding passengers to carry reeking cigar stubs and still more offensive cigarettes in their cars. The officers of the surface roads should promulgate the same rule; and they should see to the enforcement of their present regulations against smoking, which are often disregarded, especially at night. If all police justices act as did Justice Morgan, who on Tuesday fined these two fellows \$10 each, and required them to find \$300 surety for good behavior for six months, smokers will show a more general regard for the rights of others.”

TEA-DRINKING.

DR. ARLIDGE, one of the pottery inspectors of England, asserts “that a portion of the reforming zeal which keeps up such a fierce and bitter agitation against intoxicating drinks, might advantageously be diverted to the repression of the very serious evil of tea-tipping among the poorer classes. Tea, in anything beyond moderate quantities, is as distinctly a narcotic poison as is opium or alcohol. It is capable of ruining the digestion, of enfeebling and disordering the heart’s action, and of generally shattering the nerves. And it must be remembered that it is not a question of narcotic excess merely, but the enor-

mous quantity of hot water which tea-bibbers necessarily take is exceedingly prejudicial to both digestion and nutrition. Our teetotal reformers have overlooked, and even to no small extent encouraged, a form of animal indulgence which is as distinctly sensual, extravagant, and pernicious, as any beer-swilling or gin-drinking in the world.”

SALT PORK AND TRICHINÆ.

It has been so often claimed that the salting of food will kill the trichinæ which the flesh may contain, and thus render it harmless, that it is important that the public should be informed that this claim is incorrect, as is conclusively shown by the following experiment performed by M. Fourment:—

“He took a piece of meat on April 19, 1881, from some American salted meats examined at the Havre docks, and found invested. The meat was put in a flask, and imbedded in fine salt. It was then hermetically sealed, and not opened until April 1, 1882. By this time the meat had undergone a year’s salting carried to the highest degree; and if we add the time that must have elapsed since it was first put in salt in America (which could not be less than three months), the meat may be said to have been in salt for at least fifteen months. The meat was then cut up into small pieces, and these were placed in water, which was frequently changed to remove the salt, and remained for several hours at a temperature of 71° F. On April 4, 5, and 6, this was fed to a mouse, which died on the 7th, after presenting symptoms of diarrhea. The intestine was evidently inflamed, and contained sexually developed trichinæ. A second and a third mouse were fed with more of the meat, with exactly similar results. Several other experiments were made. M. Fourment says that all this shows that the trichinæ were then certainly alive and capable of reproduction after fifteen months of salting; and it is consequently manifest that salting does not surely and rapidly destroy these par-

asites. They may die in salted meats as well as in any other situation, and thus explain the negative experiments published by distinguished observers, but they may also live a considerable time without our being able to determine the length of the period after which death necessarily follows latent life."

CORK SHAVINGS FOR VINEGAR.

THE following paragraph may possibly be of interest to vinegar-eaters, especially the remark about the small organisms which exist in the pores of the cork, among which are vinegar bacteria, etc. :—

"The wood shavings commonly employed in vinegar factories preserve their activity for a certain length of time, and then become useless. Bersch explains this on the supposition that the shavings become saturated with liquid, get heavier, and press down on those beneath so hard as to prevent the air from circulating through them. He therefore recommends the substitution of the waste cork from which stoppers, etc., have been cut, for the wood chips. The elasticity of the cork is increased by moisture, so that the chips cannot pack together even in the tallest tanks. Small organisms exist in the pores of the cork, and among these are many vinegar bacteria, so that the cork is very active in making vinegar."

—*Scientific American.*

A SHOEMAKER ON WOMEN'S FEET.

SHOEMAKERS have an excellent opportunity to study the hygiene of the foot. One intelligent shoemaker, at least, seems to have profited by his opportunities, and this is what he says :—

"The feet of Americans are, as a rule, of smaller and lighter build than the feet of Englishmen, and have more arch and higher insteps. I worked in the best London shops before coming to this country, and I know there are plenty of big feet among the English aristocracy. The feet of the American ladies are smaller than

those of English ladies, but the American ladies are apt to distort their feet in a way that English ladies do not. Now, by rights, the last on which a shoe is made ought to be three sizes larger than the foot. There are four sizes to an inch, so that would give three-quarters of an inch room to the foot. An English woman will take such measurement, but if you make shoes in that way for American ladies, you will have them left on your hands. You cannot make the shoe more than from a size and a half to two sizes above the exact length of the foot. 'Anything I can get my foot in, I can wear,' they say, and so we give plenty of width between heel and ankle, so that they can slip their feet in, and they don't seem to mind how their toes are pinched together when the foot settles into the shoe. The result is, the English women have a freer, easier gait than American women."

LAW AGAINST POISONOUS COLORS.

ACCORDING to the *British Medical Journal*, the German Government recently presented to the *Reichstag* the following decree respecting the use of poisonous colors in such a way as to endanger health; we hope that some similar law may at no distant day be enacted in this country :—

"1. The use of poisonous colors for the manufacture of food-products or articles of food intended for sale, is prohibited. Those which contain the following materials or compositions are considered as poisonous colors within the meaning of this enactment: antimony (oxide of antimony), arsenic, barium (except sulphate baryta), lead, chromium (except pure chromic oxide), cadmium, copper, mercury (excepting cinnabar), zinc, tin, gamboge, picric acid. 2. The preserving and packing of food stuffs, or food-products intended for sale, in wrappers colored with the above-cited poisonous colors, or in barrels in which the poisonous color is so employed that the poisonous coloring matter can pass into the contents of the barrel, is prohibited. 3. The employ-

ment of the poisonous colors enumerated in Art. 1 is prohibited for the manufacture of playthings, with the exception of varnish and oil paints made of zinc-white and chrome-yellow (chromate of lead). 4. The use of colors prepared with arsenic for the manufacture of paper hangings, as well as that of pigments containing copper prepared with arsenic, and of matters containing similar colors for the manufacture of materials of dress, is prohibited. 5. The putting on sale, and the sale, wholesale or retail, of food stuffs and food-products preserved or packed contrary to the regulations of Articles 1 and 2, as well as playthings, paper hangings, and dress materials manufactured in contravention of the directions in Articles 3 and 4, are prohibited. 6. This law will come into operation on April 1, 1883."

DIPHTHERIA IN RATS.

OUR attention was recently called to an interesting illustration of the spontaneous occurrence of diphtheria in white rats. We were making a visit to an eminent pathologist who has devoted many months of patient experimentation to the study of this disease in human beings and various classes of animals. On inquiring the Professor's view respecting the possibility of this disease arising spontaneously, we very promptly received in reply the statement that he was thoroughly convinced by numerous observations that the malady might, and frequently did, so originate. He added that the most recent observation of this kind which he had made was in his own laboratory, where he kept a large number of animals for purposes of experimentation. A few days before, he had discovered that two or three of his white rats were ill. On making a careful examination, he discovered that they were suffering with diphtheria. As they had not for months been exposed to any possible means of infection, it was clearly a case of spontaneous origin. An examination of the surroundings showed abundant source for the germ causes of the malady, as the floor in which

the rats were kept was strewed with bones, and fragments of meat, and other putrefying material, a large number of dogs being kept in the same apartment for experimental purposes.

A TESTIMONIAL.

THE following testimonial to the excellent character of the Sanitarium is from Mrs. Henrietta Skelton, a German lady who is somewhat known to the public in this country as a temperance lecturer. As the reader will readily infer, she has been a patient at the Sanitarium, and knows whereof she speaks. She says:—

How often is it that we forget the nobler objects of life, and spend our brief days in self-indulgence and pleasure-seeking, as though enjoyment were the end and aim of our creation. The chains of pampered appetite slowly and imperceptibly strengthen, until they hold us as with an iron grasp; and when we would break the strong bands of a bad habit, we are made to realize that "the spirit is willing, but the flesh is weak." In all ages men have held drunken revels; and if we could trace this habit to its beginning, we should no doubt find that in the majority of cases the appetite for stimulants had its origin in childhood, and resulted from the use of highly seasoned and injurious articles of food. The man who has all his life been accustomed to a highly stimulating diet, or who is insufficiently nourished by a poor diet, is almost irresistibly tempted to goad on his flagging energies by the use of wine or some stronger drink. And many who have too much principle to yield to the fascinations of the wine-cup, find themselves the victims of wasting disease.

There are now several institutions in this country, where these sufferers can be treated on rational principles, if they will put themselves under their care. One of these institutions is the Sanitarium at Battle Creek, Michigan. The able superintendent of this institution, assisted by a competent corps of physicians, has built up a healthy structure out of many a physical wreck, as a multitude of living witnesses can testify. To renovate an old life is often a hard task; yet many have here been inspired with new hope and purpose for the future. It is health, not

wealth, that makes life happy. A diseased liver or a dyspeptic stomach turns the whole world into a dismal prison-house.

One needs to visit the Sanitarium at Battle Creek, in order to realize the good it is doing. It has every facility necessary for carrying on its work; and if the patients obey the rules, they can hardly fail to be benefited. The table is abundantly supplied with healthful food, such as is best calculated to build up all parts of the system. But the most important particular is the strong religious influence. The family altar (we speak advisedly when we call it the *family* altar) will bring to many a man tender memories of his childhood days, when at his mother's knee he heard the same old story of Jesus and his love. We saw tears in eyes which were unused to weeping; and we doubt not that the seed of religious truth sown at the Sanitarium, will spring up, and bear a glorious harvest.

Typhoid Fever Communicated by Milk.—

The *London Lancet* reports an epidemic of typhoid fever in which twenty-one persons were affected, which was traced to the use of milk supplied from a farm, where the well, and also a brook flowing through the premises, were thoroughly contaminated with the sewerage surrounding the privy-vault. These cases are becoming so numerous that it seems to us to be about time that we have a law requiring the inspection of premises of persons who keep dairies or furnish milk to consumers.

An Equine Tobacco-Chewer.—According to the *Saint Louis Republican*, the biped user of the filthy weed no longer holds an entire monopoly of this vile practice, since it has been demonstrated that so respectable a quadruped as the horse may, by long association with tobacco-using animals of the genus *homo*, become so demoralized as to addict himself to the practice. The above-mentioned newspaper asserts that "there is a gray horse, worked by the St. Louis Transfer Company in one of the large omnibus teams, which is an habitual tobacco-chewer. The animal is really passionately fond of the weed, and seems delighted when offered a piece of to-

bacco. The fact has become known at nearly all of the hotels, and the equine with such habits is the recipient of a great deal of attention from human beings addicted to the same habit. The driver of the bus says it costs him at least fifty cents a month to keep the horse supplied, notwithstanding the fact that the friends of the beast treat him so often. The only drawback in the way of the horse's becoming an expert in chewing the weed is that he cannot learn to expectorate. As soon as that accomplishment is acquired, the driver expects to purchase a decorated cuspidor, which is to be placed in the gray nag's stall."

Ho Food.—A number of grocers in New York City have been selling adulterated spices, for which they have been arrested. They offer as a defense the position that spices are not food, which is probably a new idea to many people. It also appears that the adulteration has been of such a character as to render these fiery condiments less harmful rather than more so.

Going at it Right.—According to one of our exchanges which we think reliable, the increase in the vice of smoking in Southern Australia has been so marked of late years that the government has felt compelled to attempt to restrict the practice by a rigorous law. Agreeably with this intention, "a measure has been introduced into the House of Assembly to the effect that any person under the age of eighteen who shall smoke any pipe, cigar, or cigarette, shall be guilty of an offense, and on conviction, shall be liable to a penalty of not less than 5s. nor more than £5; and in default of payment, may be imprisoned for any time not exceeding one month. Whenever any person shall be charged, the onus of proving the age shall in all cases lie on the person so charged. One-half of every penalty imposed is to be paid to the informer, the remainder to the treasurer for the public uses of the province."

An Expensive Dinner.—Mr. Delmonico, the proprietor of the famous New York restaurant, stated before his death that he once furnished a dinner to ten persons at an expense of four hundred dollars each, or four thousand dollars in all. This is a sample of gluttony seldom equaled, even by the old Roman gourmards. The sum of money thus wasted would have furnished a comfortable vegetarian dinner to not less than fifty thousand persons.

Repairing an Eye.—A Philadelphia oculist recently performed a somewhat unique operation in repairing an eye which had been apparently hopelessly injured by sulphuric acid, by the caustic action of which a large portion of the conjunctiva covering the eye-ball had been destroyed. The operation consisted of removing from the eye of a rabbit a portion of conjunctiva corresponding in size and shape to the part destroyed, and securing it in place upon the injured eye by means of fine stitches. It is expected that the patient will recover with useful eyesight.

Health and Temperance.

LESSON DEPARTMENT.

This department has been added to the journal at the suggestion of the Executive Committee of the American Health and Temperance Association. It will contain each month a lesson on the subject of health or temperance, together with a synopsis of the lesson, articles relating to the subject-matter of the lesson, and suggestions respecting the conduct of health and temperance schools and club meetings.

REVIEW LESSON.

1. WHAT is true temperance?
2. In what two ways may intemperance be indulged?
3. Does the Bible regard intemperance as a sin?
4. What notable examples are given in the Bible of both temperance and intemperance?
5. Who were the Rechabites, and for what were they distinguished?
6. What two kinds of wine are recognized in the Bible?
7. Describe the principal methods of preserving wine.
8. What are the three terms employed for wine in the original Hebrew?
9. What is the meaning of each?

10. To what is *Tirosh* applied?
11. What is proven by this use of these terms?
12. The use of which wine is evidently countenanced in the Scriptures?
13. What is alcohol, and how is it produced?
14. What is fermentation?
15. Is alcohol produced in nature?
16. How does it affect plants?
17. What are its effects on small animals?
18. How does it affect the different organs of the human body?
19. Is it a preventive of consumption?
20. What is the effect of alcohol upon the nerves?
21. How is the brain affected by it?
22. May insanity be produced by its use?
23. Give some examples, if you can, of its hereditary effects.
24. Name some diseases produced by it.
25. Is moderate drinking harmful?

LITERARY NOTICES.

The *North American Review* for May contains nine articles, nearly every one of which discusses some topic or problem at the present moment prominent in the public mind. Senator John T. Morgan writes of "Mexico," and sets forth the considerations of commercial advantage and international comity which are rapidly bringing about a more cordial understanding between that country and the United States. The Rev. William Kirkus, taking occasion from Bishop McQuaid's recent vaticinations regarding the decay of Protestantism, makes a vigorous counter charge upon the papal system in an article entitled "The Disintegration of Romanism." In "Emerson and Carlyle," Edwin P. Whipple discourses with all his old-time keenness of psychological insight and perfection of literary form upon the strangely diverse mental and moral characteristics of those two great thinkers. Prof. Felix Adler offers "A Secular View of Moral Training," arguing that the current skeptical habit of thought demands an independent system of practical ethics, based primarily on observation rather than on revelation. "Communism in America," by Prof. Alexander Winchell, gives very forcible expression to the apprehensions of those pessimistic observers of the trend of events in this country who think that they see in our political and social development all the signs of impending national decay. The other articles are "Affinities of Buddhism and Christianity," by the Rev. Dr. James Freeman Clarke; "Woman as an Inventor," by Matilda Joslyn Gage; "College Endowments," by Rossiter Johnson; and "Extradition," by A. G. Sedgwick. Published at 30 Lafayette Place, New York, and for sale by booksellers generally.

Publishers' Page.

—The letters received from Dr. and Mrs. Kellogg are replete with interest and good cheer. The Doctor finds excellent opportunities in London and Paris to acquire knowledge that will be of great benefit to the Sanitarium upon their return.

—The Sabbath-school at the Sanitarium April 21, and the meeting in the parlor the evening following, were seasons of unusual interest. It being the time of the State Tract Society meeting in the place, nearly a dozen ministers were present, and their encouraging remarks were highly appreciated.

—The readers of GOOD HEALTH will be pleased to know that the interesting articles on foreign travel in the present number are not the last of the kind that may be expected from the editors during their absence. We are warranted in promising similar accounts of travels and experience, for each number during their stay abroad.

—Dr. F. F. Smith, a recent graduate from the University of Pennsylvania, has arrived to assist in the work at the Sanitarium. The Medical Faculty congratulate themselves upon this valuable accession. Nearly fifty patients have arrived during the past month, and the season promises to be one of unusual activity.

—The lawn-mower has again been heard on the Sanitarium grounds. The crocuses have also put in their cheerful appearance; and work is going on in the garden, where later in the season, a wealth of bloom adds greatly to the beauty of the grounds and the pleasure of the patients.

—We need not tell the twenty thousand readers of GOOD HEALTH that this is a more than usually interesting number. Many of the articles will bear studying as well as reading. This is particularly true of the lectures in the first pages, both of which can now be had in tract form for general circulation. It would be superfluous to speak of the articles, "Notes of Travel" and "Crossing the Ocean," as all of our friends will re-read them, and wish they were longer. There are very excellent things in Miss Colman's paper, "The Problem of Thirst," which the temperance people will especially appreciate. The editorial notes and paragraphs are of usual interest, and reached us duly from the places of mailing in London and Paris. The latest information from the Doctor and his party was dated at Rome.

Popular Health Works.

A Text-Book of Anatomy, Physiology, and Hygiene. 350 pp., 150 cuts, 15 colored plates. \$1.50.

Plain Facts for Old and Young. A book for the times, treating upon all subjects pertaining to the anatomy and physiology of reproduction. 20,000 sold last year. Octavo, 512 pp. **Good Agents Wanted.** Send for Circular.

Digestion and Dyspepsia. A new book, by J. H. Kellogg, M. D. A most thoroughly rational and practical treatise on this prevalent malady. It has an illuminated frontispiece, in five tints. In cloth, 176 pp., 75 cts.

The Household Manual. A book that everybody wants. It is brim full of information on a hundred useful topics. Tells how to treat most common diseases successfully with simple remedies. 20,000 have been sold in two years. Bound, 172 pp., 75 cts.

Uses of Water in Health and Disease. Careful explanations and instructions are given respecting the uses of water as a preventive of disease, and as a valuable remedy in nearly all classes of maladies. In cloth, 166 pp., 60 cents; paper covers, 136 pp., 25 cts.

Alcoholic Poison. Or, the Physical, Moral, and Social Effects of Alcohol as a Beverage, and as a Medicine. Its statements are brief, concise, and to the point. Every temperance worker ought to have it. Paper covers, 128 pp., 25 cts.

Diphtheria. A concise description of the nature, causes, modes of prevention, and most successful mode of treatment of this now prevalent and fatal malady. Every family should have it. Four colored plates. This book has saved many lives. 64 pp., 25 cts.

Evils of Fashionable Dress, and How to Dress Healthfully. This little work considers the subject of fashionable dress from a medical standpoint, and thoroughly exposes its evils. Ultra and peculiar notions of a character obnoxious to good taste find no place in this work. 40 pp., 10 cts.

Proper Diet for Man. A scientific discussion of the question of vegetable versus animal food. Ultra notions are avoided, and the subjects treated are handled with candor. Paper covers, 15 cts.

Health and Temperance Tracts.

Wine and the Bible. A demonstration that the Bible in no degree sustains the habitual use of alcoholic drinks of any sort. Just the thing for temperance work. 24 pp., 3 cts.

The Drunkard's Arguments Answered. Leaves no excuse for tipplers, either moderate drinkers or habitual drunkards. 16 pp., 2 cts.

Alcoholic Medication. A protest against the wholesale employment of alcoholic compounds in the form of bitters, tonics, blood purifiers, etc. 16 pp., 2 cts.

Pork. This tract exposes the filthy scavenger in all his uncleanness. It destroys all appetite for ham and sausage. Republished in England. 16 pp., 2 cts.

Moral and Social Effects of Intemperance. A forcible statement of facts and statistics. 8 pp., 1 ct.

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