GOOD HEALTH.

A JOURNAL OF HYGIENE.

MENS SANA IN CORPORE SANO.

VOL. 15. BATTLE CREEK, MICH., OCTOBER, 1880. NO. 10.

ANATOMY, PHYSIOLOGY, AND HYGIENE.

BY THE EDITOR.

BONES OF THE UPPER EXTREMITIES.

THE bones of each superior extremity consist of the *scapula*, *clavicle*, *humerus*, *ulna*, *radius*, eight wrist, or *carpal* bones, five hand, or *meta-carpal* bones, and fourteen *phalanges*, or finger bones, making thirty-two in all.

THE SCAPULA.—This is an irregular, flat bone of triangular shape, situated at the posterior part of the shoulder, forming what is commonly known as the shoulder-blade. Crossing the upper part of the bone is a sharp prominence known as the spine, which passes forward and terminates in a beak-shaped projection which overhangs the shoulder joint; beneath this is a shallow depression known as the *glenoid fossa*, which receives the head of the arm bone in the formation of the shoulder joint. The scapula is not joined either by articulation or by ligaments to any of the other bones of the trunk, as it is designed to allow to the shoulder joint the greatest possible freedom of motion, being attached to the trunk by strong muscles, which hold it in place with sufficient firmness to give all needed strength to the joint.

THE CLAVICLE.—This bone, commonly known as the collar-bone, is shaped almost exactly like the italic letter *f*. It is attached at its inner extremity to the breast-bone, and by its outer to the great prominence of the scapula. Its object is to brace the shoulders apart, and thus add to the strength of the upper extremities. The clavicle is found in but few quadrupeds, but is largely developed in birds for the same reason that it is present in man. This bone is frequently broken, but as the parts cannot be very greatly displaced, the fractured ends usually unite with little difficulty and only slight deformity.

THE ARM.—The bone of the arm proper is the *humerus*, which extends from the shoulder to the elbow, of both of which joints it forms a part. It has a straight shaft, and rounded extremities, which are protected by cartilage in the manner common to all bones entering into freely acting joints. The lower end of the bone presents a notch at its inner side, through which passes an important nerve which is distributed to the inner side of the hand. It is this nerve which is hit when a person causes tingling sensations in the little finger by striking the elbow against a sharp corner. In common parlance, this part is called the funny, or crazy bone, though, as just seen, it is not a bone at all, but a nerve. By placing the end of the thumb in this notch and pressing hard, it is possible to produce the peculiar sensation at any time.

THE FORE-ARM.—The fore-arm is composed of two bones, the *ulna* and the *radius*. The first-mentioned of these is the longer of the two, and forms with the humerus the principal part of the elbow joint, extending from the elbow down to the wrist on the little-finger side of the arm. It has but a slight articulation with the wrist.

The *radius* has a large articulating surface at the wrist, and a very small one at the elbow. The two bones are united their whole length by a strong ligament. The

upper end of the radius rolls in a notch upon the side of the ulna, its end resting against the lower end of the humerus.

THE HAND.—The remaining bones of the upper extremity are included in the hand, which is divided into three portions,—the *carpus*, or wrist; the *metacarpus*, the portion between the wrist and the fingers; and the fingers, or *phalanges*.

The *carpus*, or wrist, is composed of eight small bones arranged in two rows, possessing smooth articular surfaces, which allows of great freedom of motion in a great variety of directions.

The *metacarpus* consists of five bones which join the digits to the wrist. Their motion is quite limited.

The digits consist of four fingers and a thumb. The fingers have each three phalanges, but the thumb has only two. Some, however, consider that there are but four metacarpal bones, which would allow the thumb three phalanges, like the other digits.

The finger joints are so constructed that they are capable of not only a hinge-motion, but also a slight degree of rotary motion, which gives to the hand great suppleness and diversity of action.

THE INFERIOR EXTREMITIES.

The lower extremities comprise thirty bones, which will be described in their order.

THE THIGH.—The *femur*, or thigh bone, is the largest and longest of all the bones in the body. It presents at its upper end a remarkable prominence, called its head, by which it forms, with the acetabalum of the os innominatum, the hip joint. Its lower end is greatly expanded to form the knee joint, the most extensive articulation in the body.

THE LEG.—The leg, like the fore-arm, is made up of two bones. The larger of these, the *tibia*, is the principal bone of the leg, forming the chief part in the leg portion of both the knee and the ankle joints, its companion bone, the *fibula*, taking but little part in either. The latter bone is a long, slim structure, placed beside the tibia upon the outer part of the leg. Its lower end forms the outer ankle. The two bones are firmly united throughout their whole length by a strong ligament.

A third small bone is found in the tendon of one of the large muscles of the leg, which passes over the front portion of the knee; this is termed the *patella*, or knee-cap. It exactly fits upon and protects the front side of the knee joint, which would otherwise be exposed to injury.

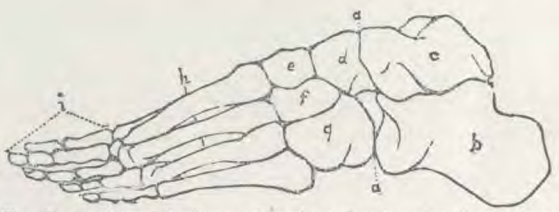


FIG. 27. Outline of the bones of the foot, showing at *c*, the *Astragalus;* *b*, the *Os Calcis*, or heel bone; *h*, the *Tarsus;* and *i*, the *Phalanges* of the toes.

THE FOOT.—Fig. 27. Like the hand, the foot is divided into three parts,—the ankle, instep, or *tarsus*, the *metatarsus*, and the digits, or toes.

The *tarsus* is made up of seven bones corresponding to the eight bones of the wrist. One of these, the *astragalus*, supports the lower end of the tibia; another, known as the *os calcis*, forms the heel and receives the attachment of the *tendo-Achilles*, the strongest tendon in the body. All are so firmly bound together that the ankle is strong enough to sustain the whole weight of the body, notwithstanding the great number of separate bones which enter into its formation.

The *metatarsus* consists of five bones closely resembling the bones of the hand, and answering the same purpose.

The digits are five in number, each, except the great toe, having three phalanges, the latter having but two, as in the case of the thumb.

The peculiar manner in which the bones of the foot are united is a matter worthy of attention. Instead of being joined together on the same plane, they are so united as to form an arch from every point of view, both laterally and longitudinally. This arrange-

ment greatly adds to the strength of the foot, and gives it an elasticity which protects other parts of the body from sudden jars and shocks.

The general shape and mutual relation of the bones of both extremities can be readily seen by reference to the view of the skeleton given in the August number.

SESAMOID BONES.—In various parts of the body where tendons pass over joints with considerable friction, small bones are often formed in the tendons, which, from their resemblance to the seeds of the sesamum, are termed *sesamoid* bones. The patellæ are bones of this class. Other sesamoid bones are often found in the feet and hands.

WORMIAN BONES.—Extra bones are sometimes formed in the cranium for the purpose of filling up a deficiency between contiguous bones. In some skulls, large numbers of these bones may be found, varying in size from that of half a pea to the size of a half-dollar. These are called *wormian* bones.

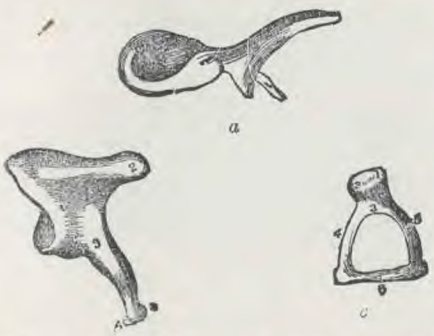


FIG. 28. Bones of the ear. *a. Malleus*, or mallet; *b. Incus*, or anvil; *c. Stapes*, or stirrup.

BONES OF THE EAR.—Fig. 28. The list of bones is not complete without the eight minute *ossicles* which help to form the apparatus for hearing.

PHYSIOLOGY OF THE BONES.

As the particular uses of the different bones of the body have already been noticed in connection with their description, we need now concern ourselves only in relation to the general functions of the bones and the uses of special groups. The functions of bones may be said to be support, protection, and motion. Each of these functions we will now examine more particularly.

SUPPORT.—As a whole, the skeleton forms the framework of the entire body. Upon its firmness depends that of the softer parts which are built upon it, the muscles, nerves, membranes, and other tissues. Without the skeleton, the other tissues would fall limp, into inextricable confusion. By means of the skeleton, the head is held erect, and the limbs supported in proper position, giving them efficiency and symmetry.

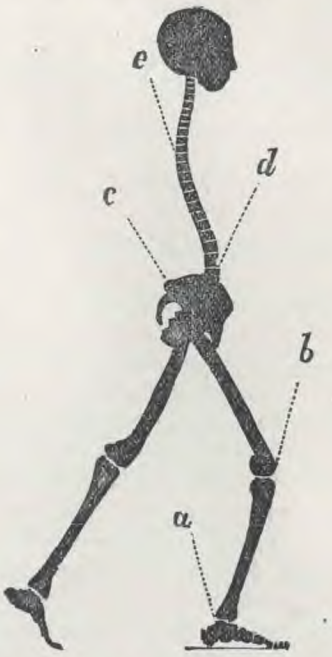


FIG. 29. Designed to show how the jar of walking is prevented from reaching the brain, by means of the curves of the body.

PROTECTION.—Equally striking is the dependence of numerous parts of the body upon the skeleton for protection from external injury. Of this we have many examples. The skull is admirably adapted to the protection of the brain, the most delicate of all the vital tissues, being a bony chamber, well arched to secure the greatest possible strength to resist external violence, and composed of two walls, with a peculiar arrangement of tissue between, especially calculated to deaden the effect of blows applied to the head by accident or design.

The head is still further protected by the peculiar curves of the spinal column, upon which it rests. This will be best understood by reference to Fig. 29, by which it will be

seen that blows received from below, as in jumping, or even in walking upon a hard surface, are little felt by the head, since the various curves conduct away the lines of force, and thus prevent much from reaching the head.

Still another means of protection is provided for the delicate brain, as if to secure it against the possibility of injury, in the fibro-cartilaginous cushions placed between the vertebræ. Fig. 25, Sept. No. The elasticity of these discs of cartilage causes them to yield to pressure whether it be slowly or suddenly applied, and thus the brain is protected from the full force of concussions which otherwise might seriously injure. Even the slight concussions constantly occurring when one is walking over an uneven surface would, without this provision, undoubtedly occasion serious injury to the brain and the delicate organs connected with it. The amount of this kind of action is better appreciated by reference to the well-known fact that people who are much upon their feet during the day, especially those who are traveling about over uneven surfaces, diminish very appreciably in height between morning and evening. Most persons vary an inch in height, and instances have been noted in which persons have lost more than two inches in height through vigorous and prolonged exercise. This is caused by the thinning of the cartilage discs from the prolonged pressure to which they are subjected. In elderly people the same thinning takes place, permanently diminishing their stature.

The spinal cord is protected by the bony canal formed by the rings of the several vertebræ composing the spinal column. The enlargement of this canal in the cervical portion, where it is much larger than the cord, is a marked instance of nature's fine adaptation of means to ends. The neck is designed to be turned in every direction freely; but this freedom of motion would disturb the function of the spinal cord except for the arrangement mentioned.

Another example of protection is seen in the thorax, which is a bony cage in which are encased the lungs, heart, great blood-vessels, important nerves, and several other important organs.

The pelvis also protects within its wide-spreading arch several important vital organs.

Throughout the body, as a rule, the large blood-vessels and most important nerve trunks are protected by their position upon the inner and under sides of the bones near which they run.

Motion.—The bones are the passive agents in the production of motion. The muscles, being excited to action by the nerves, employ the bones as levers. In walking, the body is, by means of the muscles acting on the bones, pried about from place to place. It is a curious fact that nearly all of the simple kinds of mechanical appliances are utilized in the production of motion.

Possible Function of the Bones.—It has been supposed by some of the most eminent physiologists that bones having a medullary canal may play an important part in the production of white blood corpuscles, it being thought that the medullary substance is capable of producing these bodies, the origin of which has been a subject of study by physiologists ever since they were first discovered in the blood. Whether the supposition is correct or not cannot be positively asserted at the present time, as there have been no conclusive investigations on the subject.

Composition of the Bones.—Bone substance is a curious compound of living matter, and matter possessing so low a grade of life that is even doubted by some whether or not it possesses life at all. For convenience of description, it is customary to speak of the elements of bone as being organized and inorganic, the two being supposed to be intimately blended together. It is more than probable, as before intimated, that this is not a correct statement of the fact, but that bone, like all other tissues, is a living, organized structure throughout, but so exceedingly complex in its nature that its elements are easily separated from their combination.

Recollecting the real truth in the matter, we may proceed to examine the composition of bone, for convenience considering it as a mechanical compound of certain living elements with others that are not possessed of life. If a bone is placed in the fire for a short time, when taken out it will be found to have changed its nature very remarkably.

First, it will be noticed that it has lost one-third of its weight; and, second, it will be observed that it has lost its strength and toughness. A slight force will break it, and it may be easily crumbled to a fine powder; yet it retains precisely its original form and general appearance.

If, instead of placing the bone in the fire, we had immersed it in a solution of muriatic acid for a few days or weeks, we should have obtained very different results. Supposing that we have done so, we find the bone still retaining its original form and appearance, but upon weighing it we discover that it has lost two-thirds of its weight. Its nature has also changed, for instead of being firm and inflexible, it is now so flexible that, if a rib or a fibula, it may be tied into a knot. Fig. 30.

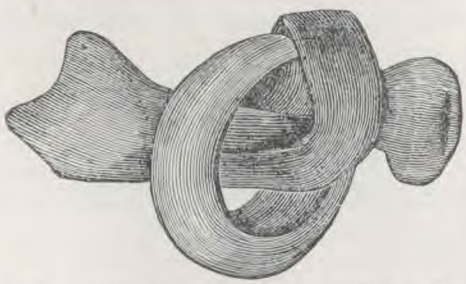


FIG. 30. A long bone which has been rendered so flexible by soaking in diluted muriatic acid that it can be tied into a knot.

If bones which have been treated in these ways be submitted to a careful chemical examination, it will be found that the bone which has been burned has lost all of its animal matter, the residue being a mixture of carbonates and phosphates of various bases. The bone which was immersed in acid will be found, on the other hand, to have lost all its mineral matter, the animal or vitalized organized portion of the bone remaining.

A careful analysis of the bones conducted in this manner, by the aid of the most refined processes known to chemical science, has determined the composition of bone to be as shown in the following table:—

Organic Matter,	Gelatine and blood-vessels,	33.30
Inorganic, or Earthy Matter,	Phosphate of lime,	51.04
	Carbonate of lime,	11.30
	Fluoride of calcium,	2.00
	Phosphate of Magnesia,	1.16
	Soda and chloride of sodium,	1.20

In childhood the proportion of animal matter is much greater, so that the bones of infants and children are much more flexible than those of older people and much less liable to fracture. In old age, on the contrary, the proportion of mineral matter greatly increases, so that the bones become exceedingly brittle, and break with very slight violence. A child will fall several feet without suffering graver injury than slight bruises which will heal in a few hours. An old person, suffering half the violence, will not escape without broken limbs. It has often happened that an elderly person has broken an arm or a leg by simply rolling off the bed during sleep, or even tripping upon a door-sill and falling upon the floor.

ADAPTATION OF DRESS TO THE SEASON OF THE YEAR.

BY B. W. RICHARDSON.

ON this subject there is great contrariety of opinion, and perhaps still greater contrariety of practice. There are those who maintain that to be healthy the body should be hardened by exposure to cold, and that to wrap up and coddle is the weakest and worst of all plans. It must be admitted that there are some persons who seem to flourish under this *régime*, and who live to advanced age without suffering from cold even when lightly clad. I have myself known three men who have approached their ninetieth year, and who always vigorously refused to wrap up at all. Such persons are great examples, but they are too exceptional to be counted as safe ones. The majority of the aged die, as a rule, rapidly during the cold weather. I have known children that have lived through their childhood half clothed in coldest seasons; and these are great examples, but they also are too exceptional to be accepted as safe examples. As a rule, ill-clad children in cold weather suffer intensely, and often die.

On the other hand, no doubt, some persons do greatly over-encumber themselves with clothes; and it is curious to observe that stout persons, who are wrapped and thoroughly lapped in their own subcutaneous non-conducting layer of fat, and who are generally feeble, encumber themselves with more clothes than their lithe and spare-

ribbed friends, who really require most protection.

The truth is, that extremes on both sides are bad, and that a dash of good common sense is required to equalize them.

In this climate the regulation of dress in relation to health is an actual necessity during the varied seasons that prevail. We may take it as a general rule, that, when the body requires more food and more sleep to meet the cold, it requires also more clothes than it does at times when sleep and food are also less wanted. There is a very remarkable physiological truth bearing on this point which every one ought to know, inasmuch as a knowledge of it becomes a guide to us in our daily life, not only in relation to dress, but to food, exercise, labor, and repose. The truth is so practical that I dwell upon it with some detail. It is this: There are certain periods of the year, in this climate, during which, independently of our wills or our actions, we are gaining in bodily weight, while there are other periods when we are losing, both periods showing a regularity which is as singularly correct as it is singularly interesting. This truth was first discovered by my late friend, Mr. W. R. Milner, for many years medical superintendent of the large prison at Wakefield. His discovery was elicited by the laborious process of weighing, daily, immense numbers of prisoners through various seasons for a long series of years.

From the consideration of the facts collected we may fairly infer that there is a periodic variation in the weight of man during the year, the six summer months being gaining and the six winter months being losing months. The amounts gained or lost gradually increase from the commencement till the termination of each period respectively; the change from the gaining to the losing period, and the converse, is, however, abrupt, and these changes take place at times not very distant from the vernal and autumnal equinoxes.

Bearing on the question thus raised by Mr. Milner, I myself, from the Registrar-General's returns, made an analysis of 139,318 deaths, with a view of determining what causes of death were connected with the varying seasons of the year; and the result was to discover that during the wasting season, which was by far the most fatal, those diseases were most rife which spring from exposure to cold, and which are extremely fatal under that condition. I have since then many times drawn special attention to the importance of regulating clothing so as to meet the emergency to which the body is exposed during the wasting period; and the rules I had then in my mind I would enforce now. It should be a settled practice with every person that he commence to put on warmer clothing a little before the wasting period begins, and that he continue it considerably beyond the time when the balance turns and the period of increasing weight commences.

Bearing still further on this point, I have received a most practical note from Rev. B. A. Irving, M. A., head master of the college at Windermere, in which the argument set forth above is fully confirmed. Mr. Irving indicates, from meteorological data, that about the 10th of May and about the 10th of November there is a remarkable fall in the mean temperature. The fall, commencing in November, continues to increase until the end of February. The pinch of cold in May is followed by warmth, which continues through the summer. The rule Mr. Irving deduces from these physical facts is, that we should be warmest clothed from the end of January to the end of February, and that summer clothing should on no account be assumed until the cold pinch about the 10th of May is well passed—say about the 15th of May. The summer dress may then be continued until the end of September; but winter clothing should be most carefully assumed before the cold pinch of November 10th—say by the 1st of November. With this sound advice I entirely agree.

Need I hesitate to say how dangerously these simple rules are ignored, and that, too, by those to whom it most solemnly applies! The delicate girl invited to the ball or evening party, in the winter season, goes there with a throat and chest exposed or partly covered, and with all her garments as light as fashion will permit them. She goes into a close room, heated to 65° or it may be 70°.

She dances herself into a glow, and then, exhausted, excited, and breathless, she passes out of the room, to exchange its warmth for a temperature of 35°, or lower—perhaps below freezing-point. She takes cold, she suffers from congestion of the lungs, and, if her tendencies are in that direction, she passes into consumption. And who shall wonder?

As spring advances, dangers increase to everybody. The weather is treacherous; a bright day or two in March seems to herald summer, and the warm clothing is cast aside. Suddenly, there is a fall of temperature with a bitter east wind, and the unprepared are caught as if in a trap. They have passed the long wintry ordeal before which so many have succumbed, and they are reviving, but have not revived. In this condition they are stricken with disease, often fatal.

You will ask, What kind of clothing is best to meet the varying changes? I answer, That which combines lightness with warmth, and which absorbs the watery secretion from the body without retaining it. For underclothing I give a decided preference to silk, basing this preference entirely on practical grounds. Knitted or woven silk is at once the material which best maintains warmth, affords lightness, and transmits perspiration. If the expense of it be urged on one side, its extraordinary durability may be named as a set-off. The silk should be worn next to the skin. Over the silk, for nine months in the year at least, there should be a woolen covering which should include the whole body. This should not be made of thick, heavy flannel, for thickness and weight contribute little to warmth, but of soft, light, fleecy material, or of that thin flannel which somewhat resembles silk in structure. The feet coverings should be of the same character, and long socks should be preferred to stockings. The upper clothing, like the under, should be of light and, at the same time, warm character, and the final overcoat or cloak should carefully vary with the season. In coldest weather fur is, I think, without doubt, the best external clothing. The overcoat or cloak should, in all cases, fit loosely to the body.

Connected with this part of my discourse, there comes in naturally the ventilation of clothes on the body. I cannot too seriously express the necessity of maintaining a free ventilation. Whatever impedes the evaporation of water from the body, leads, of necessity, to some derangement of the body, if not to disease; for the retained moisture, saturating the garments, produces chilliness of surface, and checks the action of the skin. Then follow cold, dyspepsia, and, in those who are disposed to it, rheumatism. For these reasons I always hold that the so-called waterproofs are sources of great danger, unless they are used with great discrimination. It is true they keep the body dry in wet weather, but they wet it through from its own rain; and when the body is freely exercised and perspires copiously during rain, shut up with its own secretion on one side of the waterproof covering, and chilled by the water that falls on the other, it is in a poor plight indeed. It had better be wet to the skin in a porous clothing. Hence, I would advise that the waterproof should only be used when the body is at rest, as when standing or sitting in the rain. During active exercise, a good, large, strong umbrella—none of your finikin parasol-like pretenses—is worth any number of waterproofs.

The color of the dress is another practical point of considerable moment. The *Lancet* a few weeks ago was very much criticised for suggesting that in the cold, dark weather, dresses of light color should be worn. The *Lancet*, nevertheless, was right. The light-colored dress is at once the warmest and the healthiest. In the Arctic regions white is the prevailing color of the animal that most retains its warmth. The same color is also best adapted for summer wear, for that which is negative to cold does not absorb heat. The objection made to white clothing is, that it so soon becomes dirty, or, correctly speaking, that it more quickly than darker fabrics shows the presence of dirt. This might be an advantage in many cases, but I think it is fair to admit that white, out and out, for all times and seasons, is not practical. The best compromise is a gray, and I wonder that in our climate that practical fact, which was once known and acted upon, has ever been allowed to die out. Those

wise and discerning forefathers of ours, who utilized the serviceable gray suits, were best informed, after all, in the matter of color of dress, for health as well as for service.

Fashion, in these later times, has misled once more, by the introduction of the incorrigible black clothing for the outer suit of men and women. The inconvenience of this selection reaches its height in the infliction it imposes on those poor ladies, who, after bereavement, think it necessary to clothe themselves in unwholesome folds of inky crape. Next to the suttee, this seems to me the most painful of miseries inflicted on the miserable. Happily, it is, I think, beginning to see its last days.

I would make, in one or two sentences, an observation on the coloring substances that are sometimes introduced into dress, in their relation to health. When the aniline colorstuffs were brought in for dyeing under-garments of red or yellow color, the dyes caused, sometimes, where they came in contact with the skin, a local irritation, and now and then even some constitutional derangement. The agents which were at work to produce these conditions were the poisonous dyes called red and yellow coralline. The local action of both these poisons is sharp, and they bring upon the skin a raised eruption of minute round pimples, which I have known to be mistaken for the eruption of measles by the unskilled in diagnosis. The irritation which attends the rash is painful, and if there be much rubbing of the part little vesicles may form and give out a watery discharge. Once I knew an eruption on the chest, caused by a red woolen comforter, attended with much nervous prostration; but, as a rule, the evil is purely local, the coloring matter being not readily absorbed by the skin. This is fortunate, for the poison would be intense if it were to enter the blood.

It is necessary at once to remove the colored garment when it is causing the local mischief, and such garments should never be worn again until they have been many times rinsed in boiling water.

Cleanliness in dress, the last passage in my programme, is one on which educated people should not need instruction. Health will not be clad in dirty raiment, and those who think it can be will soon find themselves subjected to various minor ailments — oppression, dullness, headache, nausea—which in themselves and singly seem of little moment, but which affect materially the standard of perfect health by which life is blithely and usefully manifested.—*Gentleman's Magazine.*

SCHOOL HYGIENE.

PROF. H. S. BAKER offers in the *Educational News Gleaner* the following good suggestions on this subject:—

The following may be taken as settled conclusions in regard to those points of sanitary science most needful to be known by the teacher. Some may be new, some old but unheeded, and some not admitted by popular opinion.

Never heat the stove red hot. In that state the iron permits carbonic oxide gas to pass through its pores into the surrounding air. This gas exists in greater abundance when the stove is nearly full of wood than when it is not so. A red hot stove, full of wood, is, then, especially favorable to the production of the gas. It is a deadly poison. Carbonic acid is, in comparison, far less powerful, although bad enough. The feeling of oppression which we charge to carbonic acid is often due to this. Headache is also produced by a very small quantity of it. It is better to build a fire in the morning an hour before it is needed, and let it burn moderately, than to build it at the last moment, and be obliged to fill the stove full of wood, and keep it red hot. Read what your chemistries say of this gas. Later works call it carbonic monoxide. Symbol, C. O.

If the air is pure, pupils will keep warm when the temperature is much lower than is necessary when the air is foul. It is pure air that warms them. Shut air from the fuel, and the fire ceases to burn. Deprive the lungs of pure air, or give them air mixed with other substances, and the animal heat lowers at once. Those take cold most readily who sleep in closed rooms. A thorough breathing of pure air will keep the body warm.

Pupils who sit erect, and breathe as they

should, will be kept warm much more readily than those who stoop, and breathe with the upper part of the lungs only. Require all to maintain an erect position at all times, if you would keep them in health.

It is a proposition that admits of mathematical proof, that the average country school-house *cannot* be so thoroughly ventilated that pupils will not suffer from the effects of the bad air if they remain in-doors the usual ninety minutes. Hourly recesses, of at least seven minutes, are a demonstrated physiological necessity. During this time, endeavor, by means of open windows and doors, to drive out the bad air, and supply its place with fresh. Even with this hourly purification, the air is far less wholesome than out-door air. But, says a teacher, we live as our fathers lived, with the air as bad as it ever is in our modern school-house, and we learned something. True. But a fearfully large percentage of your father's generation and school-fellows went to an early grave, from diseases engendered by bad air. The same is true of your early school-mates; you are survivors merely, and if it were not the teacher's duty to save life, and if he does assent, by his actions, to the verdict of the universal conscience regarding that point, then he should know that, in bad air, the progress of the pupil is not more than two-thirds of what it should be. The greater part of all studying is done during the first half-hour after opening and recesses. The effect of re-breathed air then begins to dull the intellect, oppress the senses, and render mental labor painful. Idleness and disorder follow.

The proportion of carbonic acid in the air naturally is one part of 2,500. When the amount rises to one per cent, the bad effects are very striking. Expired air contains usually about five per cent, or 125 parts in 2,500, and will extinguish a candle at once, and is, of course, very deleterious to the system. Then, if we breathe a pint of air at each respiration, that pint may be considered as spoiling at least four other pints utterly, and it will render a still larger amount somewhat deleterious. How long will it take fifty pupils to spoil the air of an ordinary school-room, or at least to double the proper amount of carbonic acid in the air?

[Each pint of expired air renders unfit to breathe over one hundred pints of air. The air in an ordinary school-room will not last fifty pupils more than three minutes before it will become so impure that its further inhalation will be actually and positively injurious.—ED.]

ADULTERATIONS OF FOODS AND DRINKS.

THE present seems to be an age of fraud and deception, and in no direction is the prevailing tendency more manifest than in the adulteration of food. It would seem that of all forms of adulteration this would be the last to be thought of or perpetrated; but so great is the cupidity of men in search of wealth that they do not hesitate to seize upon every opportunity for sophistication of food or drink of any description, utterly regardless of the consequences to the consumers of the vile compounds. In many countries this evil has grown to such magnitude that it has by law been recognized as a criminal offense, to be visited with punishment when detected. Notwithstanding all laws, however, the nefarious business flourishes, and especially in a country like this, where there is as yet not adequate legislation to control it. The punishment usually inflicted, when the crime is recognized and the offender tried and convicted, is so slight that there is no hesitancy in repeating the attempt to defraud the consumer, by sophisticating any article of food or drink he may purchase. We would suggest that an excellent means of punishment in many cases would be to compel the person found guilty of adulteration to consume the adulterated articles himself, and thus feel the actual effects of his crime. Such a mode of punishment would soon put a stop to the worst forms of adulteration, at least.

MODES OF ADULTERATION—The different forms of adulteration may be classified as *injurious*, *fraudulent*, and *accidental*. In one or another of these ways a large share of the articles employed as food or drink have been adulterated, to the serious detriment of either the health or the pocket of consumers. Some of the more serious of these adulterations we will now notice, also describing, so far as may be practically useful, the best modes of detection.

Hassall, in his very excellent work on the adulterations of food, enumerates the following formidable list of injurious substances actually found in different articles of food :—

Cocculus Indicus, arsenite of copper, emerald green, or Scheele's green, sulphate of copper, or blue vitriol, acetate of copper, or verdigris, carbonate of copper, verditer, chromate of lead, red oxide of lead, Venetian red, bole Armenian, red and yellow ochres, umber, carbonate of lead, plumbago, or black-lead, bisulphuret of mercury, or cinnabar, sulphate of iron, cayenne, gamboge, chromate of potash, Brunswick green, indigo, Prussian blue, Antwerp blue, ultramarine, alum, sulphuric acid, and bronze powders, besides chalk, plaster of Paris, terra alba, and other substances in some degree injurious, though not actively poisonous.

Let us now consider in detail some of the substances contaminated, and the modes of detecting the adulterants.

Bread.—In this country, where good flour is usually moderate in price, adulteration of bread is not as common as in England and some other foreign countries; there is no doubt, however, that adulteration is not uncommon even in this country, especially in the large cities, and particularly in the bread supplied to the poorer classes. The objects of the adulteration of bread are the production of a loaf of good appearance from inferior flour, and the retention of a large proportion of water so as to increase the weight, as in many cities the weight of loaves of a certain price is regulated by law. For this purpose alum is more frequently used than any other substance, as it produces the desired effect. Sulphate of copper has also been used, but seldom. Alum is very deleterious to the digestive organs, producing bad dyspepsia when long used. Hence, its detection is important. The following is a simple method which any one can employ :—

Detection of Alum in Bread.—The simplest method is to dip a slice of the suspected bread in a solution of logwood in water (either the extract or fresh chips may be employed). If alum is present, the bread will become a claret color. A more precise method is the following: Macerate in three or four tablespoonfuls of water a half-slice of bread; strain off the water and add to it twenty drops of a strong solution of logwood. Then add a large teaspoonful of a strong solution of carbonate of ammonium. If alum is present, the mixture will be changed from pink to a lavender blue. This test will discover a grain of alum in a pound of bread.

To Detect Blue Vitriol in Bread.—Dissolve some of the bread in warm water. Add a strong solution of prussiate of potash. If copper is present, a chocolate color will appear.

Flour.—Wheat flour is sometimes adulterated with alum, ground rice, grit, and sand. Potato starch was formerly used when flour was very high in price, but is now seldom or never employed for this purpose. Flour is sometimes contaminated with lead, which comes, together with the grit and sand, from the wheat being ground with newly cut stones, and with stones the grinding faces of which have been repaired with lead. A number of cases of lead poisoning have been reported from this cause. Flour is also adulterated by admixture with inferior grades, and with flour made from musty or grown wheat. Such flour should not be eaten.

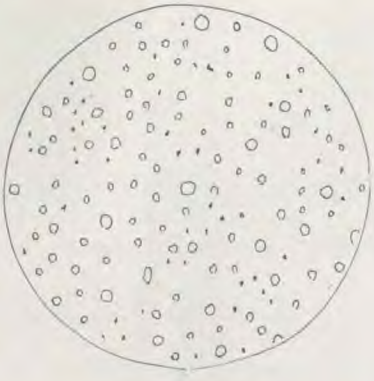
Alum may be detected in flour by the same method described for bread. The adulteration with rice and potato starch, with sand and metallic lead, may be detected by means of the microscope. Plaster of Paris can be easily detected by placing the flour on the surface of the water in a small glass vessel, as a goblet; if stirred gently, the plaster will settle to the bottom after standing a few minutes.

Mustiness can be detected by the odor; and flour having this quality should be wholly discarded.

Oatmeal is very apt to have a rank, musty odor in consequence of having been kept for a long time or mixed with that which has been spoiled. It should never be eaten.

Butter.—Formerly the only adulterants employed in butter were excess of salt, starch, and *annotto*, a peculiar coloring matter, which is itself often adulterated with gypsum, red lead, and blue vitriol. Within the last few years, however, an immense business has sprung up in the manufacture not only of

adulterated butter, but of an article which is wholly counterfeit. This fraudulent article is known to the trade as oleomargarine butter; but the article is retailed to consumers as genuine. Immense quantities of lard and tallow are manufactured into bogus butter



Genuine Butter.

in the larger cities of this country, as well as abroad. This artificial butter is often found to contain portions of flesh, membranes, and muscular tissue; and undoubtedly much of it

Oleomargarine.

is made from diseased hogs and cattle. It is highly probable that both tape-worm and trichinæ may be communicated by this article. The accompanying cuts show the contrast between genuine and artificial butter as seen under the microscope, the only means of detection.

The presence of annotto is shown by the unnaturally deep color of the butter, which will be detected by one at all familiar with the appearance of genuine butter. Other adulterants are easily detected by melting the butter with a gentle heat, when they separate.

MILK.—No article of food of general consumption is so frequently adulterated as this. The most common adulterant is water. It is said that chalk, annotto, burnt sugar, infusion of sheeps' brains, and salt are also added in some cases. A fraud is also practiced in skimming the milk, or a part of it, before taking to market. The substances commonly added are not often actually poisonous in themselves, although numerous cases of typhoid fever have occurred, in which the disease was traced to the use of milk which had been adulterated with foul water. It is probable that diphtheria, and perhaps other diseases, are occasionally communicated in the same manner. Milk may also be contaminated with lead from the use of water containing this poison, and from standing in lead-lined vessels, or zinc cans.

It is not always easy to detect adulterations in milk without a careful analysis; but any unnatural appearance or unpleasant odor should cause it to be rejected at once. Milk should be purchased only of reliable parties, and careful inquiry should be made respecting the care of the animals from which it is produced, as one of the most dangerous means of adulterating milk is feeding cows upon unwholesome food, and keeping them in close, foul, unventilated stalls. Under these circumstances, especially when the secretion is greatly prolonged beyond the natural period, as in cows known as "farrow," the milk secretion really becomes an excretory product, and contains quite a large proportion of the waste matters of the system. Such milk is totally unfit for human food, and when fed to children, especially, will be certain to produce very marked and disastrous results. There is quite too little attention paid to this, one of the most important subjects pertaining to dietetics.

—This is what the sarcastic Tertullian said of free-livers of his time:—

"Your belly is your god; your liver is your temple; your paunch is your altar; the cook is your priest, and the fat steam is your holy spirit; the seasonings and the sauces are your chrisms, and your eructations are your prophesyings."

FEMENINE ATHLETICS.

PRACTICALLY, there is no attention paid to such training at present. Parents pay but little heed to the muscular education of their girls. In fact, the idea of robust, muscular women is repulsive to most minds. A creature with limp, powerless arms and a wasp-like waist constitutes the popular idea of female beauty. Whereas, what we ought to admire is a form unconfined, well knit, "supple" as that of a panther, with an arm rounded white, and hard as marble, from the well-strung muscles under the polished skin. All this is very easily attainable. The Greek women of old possessed bodies such as I have described, and so might we British women of to-day, if only care were taken. We do not need a Spartan system to effect a change; we have the means of attaining health and beautiful strength almost without altering our mode of life. We can surely all walk. But how seldom do we meet with a woman, or even a young girl, who can "do" her five miles without great fatigue! Now, walking is one of the most delightful forms of motion when one has really learned the art. This can only be done through practice.

In order to walk with pleasure and profit to ourselves, we must begin when young, walk a set distance daily, and at a given *uniform* pace. The distance must be short at first, and gradually increased; the pace, likewise, slow at first, must quicken day by day, until the desired proficiency is attained. If mothers were careful to have the pedestrian training of their girls begun about the age of twelve, then our eyes would be gladdened by the sight of women moving with grace, dignity, and swiftness along our streets; and, moreover, we should have another enjoyment added to our list of social pleasures; for wives and sisters could accompany husbands and brothers on delightful walking expeditions, and parties for the same purpose could be organized, as we see parties uniting for a tour by sail or steamer.

There are many persons who will object to this system of physical training being added to the usual education course, on the ground that it would cause school fees to be much heavier, owing to the expense attending its adoption. Well, that might be so; but let us spend a little more money on the improvement of our children's souls and bodies and the consequent benefit of the race, and less on the covering of those poor neglected bodies with rich and costly superfluities. Let us deny ourselves in the way of fashionable raiment and expensive trivialities, that we may have the more to spend on really good and necessary objects.

If such a state of matters as I have hinted at could be brought about, a new occupation would be afforded to women who are forced (as so many are now) to work in order to live. Any lady who had no inclination for training minds might find profitable employment in training bodies, either in a situation or by taking pupils.

The athletic training of girls does not require much attention, until they are about eleven years of age. Before that time, skipping-ropes, balls, swings, and hoops plentifully supplied, and ample space for jumping and running, furnish all that is necessary. But after that age a certain primness of manner usually sets in; the young ladies are ashamed of running and leaping, they hang all day over desks, and sit quietly in the house; their bodies are growing, and proper exercise not being taken, high shoulders, narrow chests, poor appetites, and consequently ill-health and mental dormancy, are the results.

It is indeed high time we began to establish our association for the Higher Physical Education of Women. We shall never have great doings from women unless they have great souls; and we cannot expect great souls in little cramped bodies. We are told that women are cowards; but as they are usually physical cowards, and not so often moral ones, for that let us be thankful; yet physical cowardice is bad enough. It prevents women doing much that is useful in the world, prevents their fulfilling many obvious duties. You will sometimes (not often, thank God!) see a woman shrink from the bedside of some dear sick one, because she is "afraid" of fever or "cannot bear" the sight of blood. Women with little to do, and really sympathizing hearts, refuse to visit the poor or rescue the perishing, because they are "afraid" to go into low districts among "these miserable

people." And how many times do women bring down on themselves the scorn of their masculine relatives and friends, and suffer untold agonies in their own minds, through their dread of the sea of waves, of ghosts sometimes, of robbers often, and of cows, horses, and seeming-savage dogs almost always. All these fears arise from their sense of utter inability and helplessness to prevent the dreaded danger arising. But if by proper exercise and careful training we render girls strong, self-reliant, able, and skillful, then we should find that the physical cowardice of women had vanished, that their moral courage was strengthened, their minds rendered enterprising, cool, and liberal, that "nerves" were unknown, and hysterics as uncommon as demoniacal possession, and that woman had become, physically as well as mentally, a helpmeet for man.

To those who say that I am contemplating an unnatural and unwomanly state of things, I can only remind them that the finest description of a perfect type of women includes these words: "She girdeth her loins with strength, and strengtheneth her arms. . . . Strength and honor are her clothing."—*J. Hamilton Fletcher.*

HOW TO GROW OLD.

THE way to grow old is to be economical of life. If it be carelessly squandered in any way it cannot last so long as it otherwise might. Overwork kills a few. Overworry kills more, because it is more depressing and exhausting. The indulgence of the appetites and passions is still more fatal. Men who eat more than they need, drink more than is good for them, and indulge in other kinds of riotous living, spend life as they spend money.

If within certain limits the young can be lavish of life without apparent injury, this is not the case with those who have passed its meridian. As the nervous power or vital force is expended we must husband it more carefully and expend it more economically. We must limit our labor; we must guard against exposure to extremes of temperature; we must be more careful to get needful rest and sleep; and above all, we must lessen the quantity of food we take, and be more careful as to its quality. The aged do not need so much food as the young, because waste is slower, the absorbents are less active, digestion is weaker. As the demand is less, the supply must be diminished. A child wants its food often, and requires a much larger quantity in proportion to its bulk than the adult. The aged, with slower movement, less expenditure, and failing powers of digestion, assimilation, secretion, and excretion, need still less of food; and the surest way to live long and well is to gradually reduce the quantity, keeping inside of, so as never to overtask, the digestive power.

Experience *ought* to tell every man of seventy years what kind of food is best for him. But some go on in their customary routine and never try experiments. The Scotch woman in the Orkneys who died some months ago at the age of 106 lived chiefly on oatmeal. The Bedouins, who live to 130, eat barley-bread, dates, and camel's milk. Beef and brandy do not promote longevity.

There died a few years ago, and a few weeks ago, two men who made a strong mark on English literature. Each fell suddenly, "died in harness" as is said, at a little past fifty, in what should have been the prime of life. Both lived generously—both worked upon stimulants—both ate and drank too much—far more than was good for them. Gifted with powerful constitutions and high vitality, both, so far as a physiologist can judge, might have lived fifty years longer—fifty years of useful, honorable life.

The just-published letters of Charles Dickens show how his life was thrown away. We see how he ate and drank and worked—"burning the candle at both ends"—up to the last moment. Wise as he was in many things, and kind and generous as we knew him to be, he was ignorant of the science of life. And never was a valuable life more recklessly wasted and destroyed. The world is full of such examples; and though there are now a few medical men like Sir William Gull, Sir Henry Thompson, Dr. Richardson, and Dr. Norman Kerr, who see the evils of stimulation, and have some proper notions on diet, the great mass indulge in excess of food and continual stimulation, with the results that we see all around us.—*Sel.*

DR. HOWARD'S METHOD OF RESTORING A PERSON APPARENTLY DROWNED.

THIS is the plan taught by a man
In America, much renowned,
To give back breath, and snatch from death
A body apparently drowned.
Those who are the standers by
Off his wet things now must take,
Must rub him very warm and dry,
And of his clothes a bolster make.

The first step is to make him sick,
So turn him on his face;
Your roll beneath his stomach stick,
And the corresponding place
Upon his back press thrice or more;
Each time you press count slowly four.

The next thing is to make him breathe;
Therefore turn him round,
Put your roll a bit beneath
Where the shoulder-blades are found;
Then place his arms above his head,
His hips between your knees;
Your hands upon his ribs you spread,
And his sides together squeeze.

With elbows steadied on your hips,
You sudden forward press;
The weight of your body at its tips
Will make this labor less.
Backward and forward now you go,
Eight or ten times per minute, slow,
At the very least for an hour or so.

If the breathing does come back,
Let it have its way;
But if it should get too slack,
Quicken it you may.
When he breathes, the standers by,
Who all the time have rubbed him dry,
Put him in the bed they will,
And leave him now to doctor's skill.

—*British Medical Journal.*

DR. DOBBS ON ADULTERATIONS.

[THE following article, which appeared recently in the *National Baptist*, was evidently intended as a burlesque, but really represents the state of matters more truly than we could wish.—ED.]

I have been much exercised of late on the matter of the preservation of health and the perils that attend life. I am and have been for half a century (more or less) a diligent reader of all the newspapers (the real repositories of wisdom), and, not less, of all the medical treatises, on which I could lay my hands. The results at which I have aimed have been of a disquieting (not to say startling) character.

I was taking my cup of coffee from the hands of Mrs. Dobbs, when my eye fell on a remark in the paper (with which I divert myself at the morning meal, feeding body and mind at the same time, and giving now and then scraps of wisdom and information to Mrs. Dobbs and the unmarried sister, whose home is still as hitherto). The remark was on the adulteration of coffee. It appeared that it is not so much adulterated by chicory as that its place is entirely occupied by chicory; and then the chicory itself is adulterated by something, I have forgotten what. I set down the cup and turned pale. Then I said, "I think I will take a cup of tea this morning, my dear." While she was pouring it out, I read along; I found that the tea is made up of all manner of injurious Chinese abominations; that only the refuse tea leaves China; and that it is doctored and colored and poisoned in numberless ways. "On the whole, dear, if you will, give me some sweetened milk and water." Just then I remembered what I had read a few days before about how sugar was made up of glucose, which is made from old rags, and what is not glucose is terra-alba, or "white earth." I remembered what I learned the other day when on a visit to Trenton, the capital of the neighboring nation, which is the seat of the great potteries. I was told that the dishes, etc., which become broken at a certain stage of the manufacture, are packed up and sent off to the manufacturers of sugar and confectionery. I said to Mrs. Dobbs, "My dear, pardon me for troubling you, but if you will, give me just milk and water."

In the course of the day, I was reading what the Board of Health said about milk, and chalk, and calf's brains, and one thing and another, and I decided to take water. But it chanced that I fell in with Prof. Barker's Report on the Contamination of the Water of the Schuylkill River, and I learned that the water is so bad that the discharge from Dobson's Mills rather seems to improve it. It appeared to me that the further use of wa-

ter was a tempting of Providence that was hardly justifiable.

At tea, I was about to spread a modest portion of butter on my bread, when my daughter said, "O pa, did you read what the paper said about the bakers' putting alum in the bread to make it white? and did you read that article giving a long list of diseases that come from using baking-powders that have alum in them?" At the same moment my son remarked, "O father, I was down at the Police Court when Mr. Firkin [our grocer] was tried for selling oleomargarine under the name of butter." I laid down my bread and butter. . . .

I will not go on. My researches have satisfied me that everything we eat or drink is so pervaded with noxious adulterations as to be but a slow poison. I am satisfied that the only wise course is that of Dr. Tanner, the eminent abstinent, who, for a series of days, has not periled his health by eating or drinking.

But he does not carry the system of abstinence far enough. Sir, the air is just as bad as the food. Everybody tells us that the atmosphere is laden with miasma, with germs of typhoid and malaria, with every form of disease. If one goes out in the country, the air is laden with rose-cold, and hay-fever, and kindred ills. In short, I am satisfied that the only way to health and long life lies through the hermetical sealing of the throat and nostrils and every other aperture leading to the lungs.

But this is not quite all. I have just now read the following:—

"Filaria are very minute worm-like parasites, which, on entering the human body, breed until they increase to countless numbers. The discovery has been made that mosquitoes carry filaria in their probosces, and infect the human subject with the parasite."

Really, sir, I see nothing to do except for every one, in addition to total abstinence, and in addition to the hermetical sealing above referred to, also to be iron-clad, covered from head to foot with a raiment of sheet-iron that will repel probosces of the ravenous mosquitoes, with not a spot or a crevice left exposed.

FIFTY OR SIXTY?

THE use of tobacco, as now going on amongst us, shortens life, on the average, by at least ten years, and it cuts off men at the very age when they ought to be of greatest value. Sharp-sighted employers will not, as a rule, now employ a workman who is over fifty years of age. This arises simply from the fact that one way or another, men fail at fifty, as they would not fail even at sixty, were it not for the physical injury which they inflict on their bodily vigor at its very sources. At fifty, a man whose physical system has got fair play is at his very best as a productive workman. It is not so with the man who has largely used tobacco. About fifty, the average man, under the constant use of this drug, begins to show signs of nerve failure, which no clear eye can help perceiving. He shows such signs, at the very least, ten years too soon. The sixteen millions of money spent on narcotizing the nerves of the productive masses of our country is thus money spent in lessening their lives, and their productiveness. It is not only loss, inasmuch as there is no production to balance it, but loss of a far more serious character, inasmuch as it actually cuts off vast numbers who would otherwise be healthful contributors to the wealth of the community. A man is something like a tree: there is a long period of preparation with him before he can be counted on to produce anything to compensate for that which he consumes. When he does at length become productive, it is only in a slight degree. If he has time enough, however, after he has passed the preparatory stages, and becomes really fruit-bearing, he makes up, and more than makes up, for all that was spent on his preparation. If you cut off ten years of this fruit-bearing time, the loss is great indeed. It is like cutting down a fruit-tree ten years before it need show symptoms of decay. This is the actual result of the use of tobacco amongst us.—*Prof. Kirk.*

—Man, as a physical, intellectual, and moral being, becomes most completely developed in all his faculties when subsisting upon the direct productions of the vegetable kingdom."

LITERARY MISCELLANY.

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

INDIAN SUMMER.

Just before the winter breaketh,
Nature, fond and sweet, awaketh,—
  Sets her saddened, weary children all in joyfulness a-tune:
And from every wood and hollow
Come the anthems of the swallow,
  While athwart the hillside gleameth just a shadow of the June.

Just a dream of summer, stealing
With a deep, delicious feeling,
  When our senses have been shrinking at the chill of autumn air.
Still we gaze on all the beauty,
Consummate in love and duty,
  And all nature stands enraptured, breathing heav'nward praise and prayer!

And our heart-strings thrill with gladness;
All forgotten is the sadness
  Left us by the moaning winds—a heritage of earth's decay;
What though brown and bare the meadows,
If the trees are somber shadows,
  We yet sing the peerless glory of this heaven-born summer day!

—*Hope Huntington.*

HOME ENTERTAINMENT.

"JOHN, will you go over to the store with me to-night and hear old Bill White tell some yarns?"

"You must excuse me, Sam, but I would rather stay at home evenings."

"Stay at home? Why, I think the evenings are the lonesomest part of the day. Father always takes a newspaper and sits and reads until he is ready to go to bed, and hardly ever speaks a word unless he tells Johnny and me to shut up and not make so much noise, just because we try to have a little fun; while mother sits und darns stockings, or mends, and looks about as sour as father does. If I try to study or read, and move near to the light, she says, 'There is no room for you there.' Unless I have a good light I do not care much about reading."

"Well, Sam, I will tell you what to do. You come over to my house to-night, instead of going to the store, and I am sure that you will have a nice time. Won't you come?"

"Yes, I'll come, just to see what makes you think it so pleasant at home."

Promptly at seven o'clock Sam was on hand, and as John's mother told him to sit down, and pushed a low, cushioned chair toward him, he thought to himself that it looked real cozy in there. The square table was drawn out into the middle of the floor so that all might sit around it if they wished; and the large lamp gave such a bright light that even the old rag carpet, that Mrs. Forrest was afraid would not last through the winter, looked better to Sam than did the new carpet that his mother had just put down. The fire, too, seemed to burn better than it did over in Sam's house; how it did snap and burn.

"That is a sign of cold, father," said Mrs. Forrest, "when the fire snaps like that," at which they all laughed at mother's still clinging to the old signs.

"Come, John, where is the book?" asked his father. John brought the book, and then Mr. Forrest explained to Sam what he had been reading. After they were all seated, mother with her knitting, Dora with her canvas and zephyrs, while John got out his crochet work,—even if he was a boy sixteen years old, he knew how to knit and crochet, and he was not ashamed of it, either,—then Mr. Forrest proceeded to read how Mr. Pickwick, with his friends, went to visit Mr. Wardle; and when he came to where they were skating, and poor Mr. Pickwick fell into the pond, Sam laughed until his face was so red and his eyes so full of tears, that it made every one laugh to look at him.

At half-past nine o'clock the book was closed until another evening, and Sam, after having promised to come again the next evening, went home and went to bed happier than he had been for a long time. As he

jumped into bed, he said aloud, "I wish my father and mother were like John's. It was a great deal better than listening to Bill White; he swears so."

Fathers and mothers, make the long winter evenings pleasant and happy for the boys and girls. Let them have plenty of light, and get them good books to read; and if they are a little noisy, let it pass, and remember that these same noisy boys and girls will soon be men and women, and when they go forth from the old home, they will take with them the remembrance of happy evenings when they were all together.

There are too many homes like Sam's, and too few like the one I have been telling about.

BOOKS.

BY HENRY WARD BEECHER.

WE form judgments of men from little things about their houses, of which the owner, perhaps, never thinks. In earlier years, when traveling in the West, where taverns were scarce, and in some places unknown, and every settler's house was a house of entertainment, it was a matter of some importance and some experience to select wisely where you would put up. And we always looked for flowers. If there were no trees for shade, no patch of flowers in the yard, we were suspicious of the place. But, no matter how rude the cabin or rough the surroundings, if we saw that the window held a little trough for flowers, and that some vines twined about strings let down from the eaves, we were confident that there was some taste and carefulness in the log cabin. In a new country, where people have to tug for a living, no one will take the trouble to rear flowers unless the love of them is pretty strong; and this taste, blossoming out of plain and uncultivated people, is itself like a clump of harebells growing out of the seams of a rock. We were seldom misled. A patch of flowers came to signify kind people, clean beds, and good bread.

But in other states of society other signs are more significant. Flowers about a rich man's house may signify only that he has a good gardener, or that he has refined neighbors, and does what he sees them do. But men are not accustomed to buy *books* unless they want them. If, on visiting the dwelling of a man of slender means, we find that he contents himself with cheap carpets and very plain furniture, in order that he may purchase books, he rises at once in our esteem. Books are not made for furniture, but there is nothing else that so beautifully furnishes a house. The plainest row of books that cloth or paper ever covered is more significant of refinement than the most elaborately carved *étagère* or sideboard.

Give us a house furnished with books rather than furniture. Both, if you can, but books at any rate! To spend several days in a friend's house, and hunger for something to read, while you are treading on costly carpets, and sitting upon luxurious chairs, and sleeping upon down, is as if one were bribing your body for the sake of cheating your mind.

Is it not pitiable to see a man growing rich, augmenting the comforts of home, and lavishing money on ostentatious upholstery, upon the table, upon everything but what the soul needs? We know of many and many a rich man's house where it would not be safe to ask for the commonest English classics. A few garish annuals on the table, a few pictorial monstrosities, together with the stock religious books of his "persuasion," and that is all! No poets, no essayists, no historians, no travels or biographies, no select fictions, or curious legendary lore. But the wall-paper cost three dollars a roll, and the carpets four dollars a yard!

Books are the windows through which the soul looks out. A home without books is like a room without windows. No man has a right to bring up his children without surrounding them with books, if he has the means to buy them. It is a wrong to his family. He cheats them! Children learn to read by being in the presence of books. The love of knowledge comes with reading and grows upon it. And the love of knowledge, in a young mind, is almost a warrant against the inferior excitement of passions and vices.

Let us pity these poor rich men who live barrenly in great, bookless houses! Let us

congratulate the poor that, in our day, books are so cheap that a man may every year add a hundred volumes to his library for the price of what his tobacco and his beer would cost him. Among the earliest ambitions to be excited in clerks, workmen, journeymen, and, indeed, among all that are struggling up in life from nothing to something, is that of owning, and constantly adding to, a library of good books. A little library growing larger every year, is an honorable part of a young man's history. It is a man's duty to have books. A library is not a luxury, but one of the necessaries of life.—*Eyes and Ears.*

HOW TO TREAT BROTHERS.

GIRLS, be kind to your brothers. Don't be afraid you will spoil them by showing them plenty of sisterly attention. They are tiresome sometimes, consequential and overbearing, treating their sisters like inferior beings. But never mind that, girls; carry with you the two bears,—bear and forbear. The consequential age generally passes off with the growth of the incipient mustache, and when real manhood dawns upon them, they will realize how gentle and kind their sisters have been. Make home pleasant to them; let them see and feel that you enjoy their company sometimes equally as well as that of some other girl's brother. If you sing or play on the piano, do your best for brother Will or Bob, or whatever his name may be, and reward him with a smile when he turns over your music or gives up his seat to you, just as you would any other gentleman. Lay aside your work or book to have a pleasant chat or innocent game with your brother; draw out of him with whom and where he spends his evenings outside of the family circle. Encourage him to speak of his associates. A sister often has more influence with a brother than a parent. If he can confide in his sister regarding his friends and amusements, you need have no fear of how he spends his time away from you. Let him see that you take an interest in his studies or his business. When he asks you to sew on a button or mend his glove, don't put on an aggrieved air; do it cheerfully, willingly. He will reward you in his secret heart with a wealth of brotherly love, though he may not show it, for some think it unmanly to display affection. Treat his friends with politeness, even if they are not your style. Throw all the safeguards you possibly can around your young brothers, by sisterly kindness and forbearance. Try to make *home* the happiest and dearest place on earth.—*Sel.*

"WILL I BE LIKE YOU, PAPA?"

A GENTLEMAN who for years had been more or less under the influence of liquor, and whose red nose and bloated figure stamped him as an inebriate, had gone home to his wife and children in this condition. He was not unkind in act or in words. It was his delight to play at games with his little ones, as he was able, and to entertain them with wonderful stories. On this occasion the family were all together in the sitting-room, and the usual games having been played, little Freddie, a lad about six years of age, had climbed upon his father's knee, and was asking all sorts of boyish questions. He talked as a child will,—of what he would do when he was a "big man!" asked if he would be like papa then; and finally, after a long and serious look into his father's face, with every shade of childish curiosity in his voice and glance, put to him this bewildering query:—

"Papa, when I grow up to be a man, will my nose be red like yours, and my face all swelled?"

Ah! why should that poor swollen face grow redder than it was wont to be? Why should his arms so quickly draw that boy to his breast? And why should tears flow and voice tremble as he replied in words and tone that made his mother's heart glad:—

"No, Freddie, please God, you won't be like me when you get to be a man; and neither will your father, my boy, for from this hour he will lead a sober life."

"Be like him!" He had not thought of that before, and the bare possibility staggered him. All the love of his father's heart cried out against such a fate. That boy! His pride! going about with a bloated face and poisoned breath? No, no! he was not prepared for that! Never before had he seen his own looks so clearly; they were reflected in the boy's,—the boy grown to manhood;

and honor, affection, and reason, came to the rescue. The child had preached a sermon no orator could deliver; and innocence and ignorance had accomplished what learning and logic had aimed at in vain.

Those words "went home."—*Sel.*

TRYING TO LIVE WITHOUT REAL WORK.

THE following from the pen of Horace Greeley is true, and applicable to this day:—

"Our people are too widely inclined to shun the quiet ways of productive labor and try to live and thrive in the crooked paths of speculation and needless traffic. We have deplorably few boys learning trades, with ten times too many anxious to 'get into business;' that is, to devise some scheme whereby they may live without work. Of the journeymen mechanics now at work in this city, we judge that two-thirds of them were born in Europe; and the disparity is still augmenting. One million families are trying to live by selling liquor, tobacco, candy, etc., etc., in our cities, who would be spared therefrom without the slightest public detriment; and if these were transferred to the soil, and set to growing grain, wool, etc., or employed in smelting the metals or weaving the fabrics for which we are still running into debt in Europe, our country would increase its wealth at least twice as fast as now, and there would be far less complaint of 'dull trade' and 'hard times.'"

HOME-KEEPING.

THIS word expresses true home work much better than the word house-keeping; though the latter represents to most feminine eyes the cause as well as the theater of most domestic trouble.

The business of keeping the house is, at best, generally considered a sort of inevitable trouble to be endured, a round of continually recurring events more or less disagreeable, to be lived through, or worried through, with as much patience as possible. Even those who put real love and thought into their work, find it sometimes a perplexing struggle against dirt, dust, and death, that oftener than otherwise ends for the weary worker in defeat.

The true science of caring for home will never be understood until it is recognized as a fact that it *is* a science; that those who look after the life and comfort of families must be educated for that work as carefully and as thoroughly as those who enter any other business in life. To keep a house neatly and quietly, to see that the food is properly and palatably served; to know when the drain, the kitchen, and cellar are all in proper sanitary condition; to see with love's quick eye the first and mildest symptom of disease, and be ready with simple remedies, that the family physician may not be called in unnecessarily; to entertain pleasantly and heartily all guests; and to do all this without worry or friction within a certain income, takes not only education and practice, but positive genius;—and many mothers who have passed successfully through this ordeal, and at fifty can look upon sons and daughters grown to respected and cultured men and women, are possessed with organizing power, and quick perceptions, and executiveness, as well as physical strength, enough to manage armies and plan as victorious campaigns as ever brought glory to any flag.

Women possess all the natural traits necessary to so complex a work as the business of home-keeping, and child-rearing. But how can the best results be expected if there is no training? As well expect a young man with a genius for law, to become a successful barrister without education or special training.

It has always been the fashion to consider house-keeping a small and rather a vulgar matter—a house a place for a man to sleep and eat in, and for a woman to spend money upon.

If things go smoothly, all right; nobody to be thanked; if things go wrong, the mistress is no manager, but the master is pitied and condoled with by all the neighbors.

This view of things is all wrong. The house where a man and woman live their private lives, where their children are born, and live or die, is the most important spot on earth to them. The very walls are sacred. It is more matter to them if one tiny poison spore floats from sewer-pipe into the room where the dear baby lies sleeping, than if a whole people across the water is prostrated

by a plague. More important to them is harmony and good feeling, and moral and physical well-being, than the peace and prosperity of a dozen nations.

It is time mothers recognized these things, and taught their boys and girls both the importance, the majesty, of a peaceful, well-ordered household.

Let the girls be taught to keep house; let them learn to look upon it as a noble occupation. Teach them to feel, if they marry, that it is as much their place to make home a cheerful, healthful, happy place, as it is the duty of the husband to earn the living.

They should carry the keys and do the buying for the family, under their mother's supervision, in their father's house,—they should be taught how to bring their expenditures to certain limits; to know the value of money, and the value of commodities, and above all, the value of time. Every mother owes this teaching to her daughter's husband; and she commits a crime against humanity if she does not fulfill this duty.

It is a fact that at least one quarter of the children that die are victims to the unpardonable ignorance of their mothers; and probably to say one-half would not be an exaggeration.

Dare we say, as we lay in the ground our dear little ones, that the thought and labor necessary to make the table, the bedrooms, the clothing, and all the subtle conditions of home, as pure and healthful as possible, is a vulgar drudgery unworthy of the best consideration?

It is not necessary that mothers should be drudges, any more than that merchants should be their own porters, or professional men their own clerks. But just as it is the duty of the father to watch every little odd and end of his business, to know his income and outgo, and to provide to the very best of his ability, support and protection for his family; so is it the duty of the mother to know all the ins and the outs of her house, to spend her money carefully, and yet freely enough for health and comfort so far as it is possible to get them, and to study with unending patience the happiness and development of those about her.

If a girl who expects at some time to be the mistress of a home considers these things beneath her notice, she is not worthy of a bad man's love, much less a good man; and if she marries, hiding from her husband her inefficiency, and what is worse, her selfish, idle mind, she is a *fraud*, and deserves any misery that ignorance may bring upon her.

These are strong words, but they are not half strong enough.—*Woman at Work.*

THE DIGNITY OF WORK.

It is impossible that a man shall be a drone, and go through life without a purpose, and maintain his self-respect. No idle man, however rich he may be, can feel the genuine independence of him who earns honestly and manfully his daily bread. The idle man stands outside of God's plan, outside of the ordained scheme of things; and the truest self-respect, the noblest independence, and the most genuine dignity, are not to be found there. The man who does his part in life, who pursues a worthy end, and who takes care of himself, is the happy man. There is a great deal of cant afloat about the dignity of labor, uttered mostly, perhaps, by those who know little about it experimentally; but labor has a dignity which attaches to little else that is human.

To labor rightly and earnestly is to walk in the golden track that leads to God. It is to adopt the regimen of manhood and womanhood. It is to come into sympathy with the great struggle of humanity toward perfection. It is to adopt the fellowship of all the great and good the world has ever known.

Never was a worthy work accomplished, above which the worker did not stand with the feeling that by his work he had been fitted for something higher. Every generation that has stepped from its sphere of labor into the shadowy beyond, has walked forth with the results of its labor beneath its feet. He who hath builded the house hath more honor than the house. Thus, work, in its results, lifts each generation in the world's progress from step to step, shortening the ladder upon which the angels ascend and descend, and climbing by ever brighter and broader gradations toward the ultimate perfection. A new and more glorious gift of power compensates for each worthy expendi-

ture, so that it is by work that man carves his way to that measure of power which will fit him for his destiny and leave him nearest God.—HOLLAND, in *Plain Talks.*

How to Choose Books.—Would you know whether the tendency of a book is good or evil, examine in what state of mind you lay it down. Has it induced you to suspect that that which you have been accustomed to think unlawful, may after all be innocent, and that that may be harmless, which you hitherto have been taught to think dangerous? Has it tended to make you dissatisfied and impatient under the control of others; and disposed you to relax in that self-government, without which both the laws of God and man tell us there can be no virtue and consequently no happiness? Has it attempted to abate your admiration and reverence for what is great and good, and to diminish in you the love of your country and your fellow-creatures? Has it addressed itself to your pride, your vanity, your selfishness, or any other of your evil propensities? Has it defiled the imagination with what is loathsome, and shocked the heart with what is monstrous? Has it disturbed the sense of right and wrong which the Creator has implanted in the human soul? If so—if you are conscious of all or any of these effects—or if, having escaped from all, you have felt that such were the effects it was intended to produce, throw the book into the fire, young man, though it should have been the gift of a friend! Young lady, away with the whole set, though it should be the prominent furniture of a rosewood book-case!—*Robert Southey.*

Gen. Garfield's Advice to Young Men.—The following extract is from an address of Gen. Garfield to the graduating class of Spencerian Business College, Washington, D. C.; it contains advice which is worth more than a gold mine to a young man starting in life without clear ideas of "How to get on in the world:"—

Let me beg you, at the outset of your career, to dismiss from your mind all idea of succeeding by luck. There is no more common thought among young people than that foolish one that by-and-by something will turn up by which they will suddenly achieve fame or fortune. No, young gentlemen; things don't turn up in this world unless somebody turn them up. Inertia is one of the indispensable laws of nature, and things lie flat where they are until by some intelligent spirit (for nothing but spirit makes motion in this world) they are endowed with activity and life. Do not dream that some good luck is going to happen to you and give you fortune. Luck is an *ignis fatuus.* You may follow it to ruin; but not to success. The great Napoleon, who believed in his destiny, followed it until he saw his star go down in blackest night, when the Old Guard perished around him, and Waterloo was lost. A pound of pluck is worth a ton of luck.

Young men talk of trusting to the spur of the occasion. That trust is vain. Occasions cannot make spurs. If you expect to wear spurs, you must win them. If you wish to use them, you must buckle them to your own heels before you go into the fight. Any success you may achieve is not worth the having unless you fight for it. Whatever you win in life you must conquer by your own efforts, and then it is yours,—a part of yourself.

GRAPES OR THORNS.

WE must not hope to be mowers,
And gather the ripe gold ears,
Until we have first been sowers,
And watered the furrows with tears.

It is not just as we take it—
This mystical world of ours:
Life's field will yield, as we make it,
A harvest of thorns or of flowers.

—*Alice Cary.*

The Human Figure.—The proportions of the human figure are six times the length of the feet. Whether the form is slender or plump, the rule holds good; any deviation from it is a departure from the highest beauty in proportion. The Greeks made all their statues according to this rule. The face, from the highest point of the forehead, where the hair begins, to the chin, is one-tenth of the whole stature. The hand, from the wrist to the end of the middle finger, is the same. From the top of the chest to the highest point of the forehead is a seventh.

If the face, from the roots of the hair to the chin, be divided into three equal parts, the first division determines the place where the eyebrows meet, and the second the place of the nostrils. The height from the feet to the top of the head, is the distance between the extremity of the fingers when the arms are extended.—*Sel.*

Charity of Speech.—Charity of speech is as divine a thing as charity of action. The tongue that speaketh no evil is as lovely as the hand that giveth alms—to judge no one harshly, to misconceive no man's motives, to believe that things are what they seem to be until they are proved otherwise, to temper judgment with mercy. Unkind words do as much harm as unkind deeds; many a heart has been wounded beyond cure by words; many a reputation has been stabbed to death by a few little words; they have separated families, parted husbands and wives, and broken the ties between the dearest friends. There is a charity which consists in withholding words, in keeping back harsh judgment, and in refraining from speech, if to speak is to offend.—*Sel.*

Learn to Be Short.—Long visits, long stories, long exhortations, long prayers, and long editorials, seldom profit those who have to do with them. Life is short; time is short; moments are precious. Learn to condense, to abridge, and intensify. We can endure many an ache and ill if it is soon over, while even pleasures grow insipid and pain intolerable if protracted beyond the limit of reason and convenience. Learn to be short. Lop off branches; stick to the main fact in your case. If you pray, ask for what you desire, and stop. If you speak, tell your message, and hold your peace. Condense two words into one, and three into two. Learn to be short.—*The Appeal.*

Wanted—An Easy Place.—Rev. Henry Ward Beecher, some time since, received a letter from a young man, who recommended himself very highly as being honest, and closed with the request, "Get me an easy situation, that honesty may be rewarded." To which Mr. Beecher replied: "Don't be an editor if you would be 'easy.' Do not try the law. Avoid school-keeping. Keep out of the pulpit. Let alone all ships, stores, shops, and merchandise. Abhor politics. Keep away from lawyers. Don't practice medicine. Be not a farmer nor a mechanic; neither a soldier nor a sailor. Don't study. Don't think. Don't work. None of them are easy. O my honest friend, you are in a very hard world! I know of but one real 'easy' place in it. That is the grave."

The Origin of "$".—The editor of the London *Whitehall Review* at a dinner recently propounded the following: "What is the origin of the sign for the American dollar?" The American consul did not know. It was suggested by one of the guests that the sign was a sort of monogram of the United States, from "U. S." But this would not do. The American dollar, says the editor, is taken from the Spanish dollar, and the sign is to be found, of course, in the associations of the Spanish dollar. On the reverse of the Spanish dollar is a representation of the Pillars of Hercules, and round each pillar is a scroll, with the inscription, "*Plus ultra.*" This device in the course of time has degenerated into the sign which stands at present for American as well as Spanish dollars, "$." The scroll round the pillars, I take it, represents the two serpents sent by Juno to destroy Hercules in his cradle.—*Sel.*

POPULAR SCIENCE.

Electricity as a Vitalizing Agent.—One of the most useful practical applications of the results of scientific research is the employment of electricity in medicine. The value of this agent in reviving the system when exhausted from disease or other cause is most remarkable. According to a contemporary, "An extraordinary case is reported from Hungary. A criminal was hung until pronounced by the attending physicians quite dead. As a scientific experiment, the body was then subjected to an electro-galvanic current, when after a few hours, signs of life became apparent. The convict soon completely recovered

his senses, but died the next morning from congestion of the brain."

Electricity has been highly recommended for use in apparent death from lightning-stroke. We have used it with success in cases of opium-poisoning which threatened to prove fatal.

Illusions and Apparitions.—We copy the following interesting explanation of illusions and apparitions from the *Popular Science Monthly*:—

All illusive visions and apparitions are susceptible of a scientific explanation. They originate in some derangement of the brain and nervous system, and are for that reason most likely to occur to persons who are out of health. The apparent reality of some of these illusions is often wonderful, and might well prompt those who are not acquainted with nervous physiology, or who have not devoted careful attention to the subject, to refer them to something out of the common. Even while we are in perfect possession of our faculties, we imagine that we see objects before us as clearly as though they were actually present, or hear, with equal distinctness, sounds which have no real existence outside of themselves. The explanation may be found in a simple study of the physiology of the nervous system, and shows that the illusions have a material basis. Our sensations are transmitted from the organ that receives them to the brain, and it is the brain, not the organ, that experiences them and is their seat. In the case of sight, it is the function of the eye to receive and adjust the rays of light coming from the object that we see, so that they shall produce an impression on the brain. The eye represents the lenses of the photographer's camera; but the brain corresponds to the sensitive plate which receives the image, and on which all subsequent alterations of the image are effected. Similar relative parts are played by the organs and the brain in the case of the other senses. Now, if a similar impression to that which is transmitted to the brain from the organ of sense is produced upon it by any other cause, the same kind of sensation will result. This may happen when the brain is in an excitable or irritable state from ill health or any other cause, and is enough to explain all the phenomena under consideration. The visions most often correspond to our previous experiences, and therefore represent objects we know. Sometimes, however, the images are unfamiliar, and they are then referred to objects that we have seen, but have ceased to remember in our natural condition. The apparitions are thus explained as the creatures of our imagination, which, through some brain-disturbance, is enabled to project its visions forward on the seats of sense, just as the ringing in the ears, with which we are all familiar, is produced by some irritation of the hearing center of the brain.

Germs of Disease in Water.—Professor Huxley, in a recent discussion of a paper by Dr. Tidy on water for dietetic purposes, said that diseases caused by what people not wisely call germs are produced invariably by bodies of the nature of bacteria. These bodies could be cultivated through twenty or thirty generations, and then, when given under the requisite conditions, would invariably cause their characteristic disease. Bacteria are plants, and we know under what conditions they can live and what they will do. They can be sown and will thrive in Pasteur's solution, just as cress or mustard in the soil; and if a drop of this solution were placed in a gallon of water, Professor Roscoe thinks it doubtful if there is any known method by which its constituents could be estimated. Every cubic inch of such water would contain fifty thousand to one hundred thousand bacteria, and one drop of it would be capable of exciting a putrefactive fermentation in any substance capable of undergoing that fermentation. The human body may be considered as such a substance, and we may conceive of a water containing such organisms which may be as pure as can be as regards chemical analysis, and yet be, as regards the human body, as deadly as prussic acid. This is a terrible conclusion, but it is true; and, if the public are guided by percentages alone, they may often be led astray. The real value of a determination of the quantity of organic impurity in a water is that by it a shrewd notion can be obtained as to what has had access to that water. If it be proved that sewage has been mixed with it, there is a very great chance that the excreta of some diseased person may be there also. On the other hand, water may be chemically gross, and yet do harm to no one, the great danger being in the disease-germs.—*Sel.*

GOOD HEALTH.

BATTLE CREEK, MICH., OCTOBER, 1880.

J. H. KELLOGG, M. D., EDITOR. TERMS, $1.00 A YEAR.

PERIHELION PLAGUES.

THE perihelionists have doubtless been most sadly disappointed the past year; for instead of having the coldest winter and the hottest summer ever experienced, the last winter was remarkably mild, and the recent summer has been most aggravatingly cool, and this notwithstanding the steady approach of the frightful perihelion which it has been asserted is to engulf us in universal plagues, famines, and general demoralization. The following extract from an English journal well illustrates the folly of adopting the chimerical fancies of every theorist who succeeds in getting his vagaries into print:—

"Professor Piazzi Smyth is a prophet of the right sort; for he told the Royal Society of Edinburgh the other night that his prediction made in 1872 was so remarkable that he wished he had then died, 'for then the statement would have been remembered,' and a new science would have been born in a day! The prediction was that the year 1880 would be 'warm,' but we have already reached nearly the middle of July, and alarming statements as to the thermometer have been conspicuous by their absence. It is a remarkable fact, but the forces of nature continue to act in their own way, and Professor Smyth is still alive to favor us with further predictions founded on laws of his making. If there are sun-spot meteorologists, there are others who swear by the planets; and it is notable that, while Professor Piazzi Smyth was instructing the members of the Royal Society of Edinburgh in the mysteries of heat-waves, another prophet was delighting the inhabitants of Dulwich with his theory of cold-waves, produced by the planet Venus, which, strange to say, occurred just about the same time as Professor Smyth's heat-waves. The Dulwich prophet is a Job's comforter; for he tells us that for the next forty years the temperature will be below the average, although he promises us a heat-wave every twelve years, because Jupiter arrives at perihelion at those intervals."

DANGEROUS ADVICE.

ONE of the most encouraging features of the times is the popularization of knowledge upon all subjects pertaining to hygiene; but we sometimes fear that quite as much harm as good is often done by individuals who attempt to give instruction on subjects upon which they are really unprepared to speak authoritatively. Not infrequently we meet with examples of this in which, if the advice given were followed, the most disastrous results would be almost certain to ensue. For example, we find the following copied from a popular domestic paper:—

"The simplest way to fumigate a room is to heat an iron shovel very hot and then pour vinegar upon it, drop by drop. The steam arising from this is disinfectant. Doors or windows should be opened that it may escape. Carbolic acid is a well-known disinfectant, and so is copperas. The latter costs but a few cents a pound in the crystal. A little of it in a deep plate or saucer covered with water purifies the air.

"For those who are necessarily exposed to infection, an excellent safeguard is washing the hands and face with spiced vinegar before entering the room. This has been done in time of plague with great success. It is an excellent plan for any one who is obliged to enter an infected room to wear a respirator, such as little tufts of cotton, in

the nostrils; these may be dampened with vinegar."

Of the above two paragraphs every sentence is a dangerous error but two. The vapor of vinegar is not in any degree a disinfectant. The odor produced in the manner described might obscure some slight odor, but it would not destroy it, and "germs" would flourish luxuriantly. It is true that copperas is a good disinfectant, but "a little of it in a deep plate or saucer covered with water" *does not* purify the air. Such protection from disease germs as this is quite equal to none at all, but no better. Washing the hands and face with spiced vinegar as a protection from the infection of contagious maladies is about equal, as a preventive measure, to the wearing of an "armlet" or a "charm" for the same purpose, or carrying a horse-chestnut in the pocket to keep away "rheumatics." Wearing a cotton respirator, when exposed to infection, is a very excellent measure; but we imagine that very few persons would be able to breathe freely through the nose while the nostrils were filled with "little tufts of cotton"; and if the cotton was saturated with vinegar, suffocation would be imminent unless the mouth were opened, as wet cotton is as impervious to air as to germs.

Such advice as this is really dangerous in no small degree, as it leads people to trust in measures which are utterly worthless; and in cases in which life depended on having the right thing done at the right time, the most serious consequences would result from following such advice. Editors are not so careful as they should be about publishing unreliable statements on subjects pertaining to life and health. Journals devoted to the instruction of the people on health subjects should be especially careful about copying such statements, and thus giving character and greater publicity to gross errors.

Anti-Vaccination Petition.—According to the *Echo*, an English newspaper, a petition against vaccination was recently presented to the English House of Commons from the British Medical Association, signed by seven thousand medical men. Notwithstanding the many arguments urged in favor of vaccination, and the support given it by the most eminent medical authority, there seems to be a growing prejudice against the practice. It is to be hoped, erelong, such experiments will be made as will settle this question beyond all chance for doubt as to the real merits of the case.

BREAD.

Good bread is well called the staff of life, though in this country and England there is a popular notion that beef is the real staff of life. Poor bread, however, is perhaps the poorest of all articles of food. Nothing can be much more indigestible than the "heavy," pasty stuff that sometimes passes for bread; and about equally to be condemned is the product of saleratus and sour milk or of alum-adulterated baking-powders which daily appears on the table of thousands of families. Even leavened bread is in some respects open to objection, since the nutritive value of the grain is deteriorated by the process of fermentation.

Leavened bread is by no means a very ancient article of food, although history does not give us any account of the discovery of the art of making fermented bread. It seems from history, however, that we received the art from the Romans; and, according to *All the Year Round*, "the Romans had their bread as well as their gods, their science, and their poetry, from Greece. It was not bread that built up and sustained the noblest Romans of them all. The idea of bread was not among the things conquered to herself by Rome, until the war with Perseus, king of Macedon. Romulus and Remus, and the kings that followed them,—Coriolanus, Cincinnatus, Regulus,—never ate bread. Rome was more than five centuries old before its people learnt of the Greeks how loaves were made, and escaped from the reproach of being a 'pulse-eating nation.' The noblest Romans throve on pulse and bannocks, until they received from the Greeks the art of making leavened loaves. The knowledge passed from Rome into her provinces of Southern Europe. But it did not pass northward so easily. Rye cakes, baked twice a year, served, until very lately, as the chief representative of bread in Sweden. Barley

bannocks and oat-cakes alone remained the staff of life in Scottish villages. Gottenburg, the first harbor and the second town of Sweden, contained, fifty [seventy] years ago, 12,000 inhabitants. When a captain ordered of a baker of the town twenty shillings' worth of bread, the astonished man asked for security that the loaves would be all paid for before he would consent to execute the order, as, if left upon his hands, it would be impossible to find sale for them."

A SERMON ON SLEEP.

[A SERMON on sleep was recently preached in the "Church of the Messiah," New York City, by the paster, Rev. Robert Collyer, the eminent Unitarian minister. The preacher's text was John 11 :12 : "If a man sleep, he shall do well;" and his sermon contained so much good hygienic sense that we are certain our readers will be profited by a perusal of the following abstract of it.—ED.]

"I notice the old Bible men make much of sleep. There is more in it, by far, to them than there is to the men of our time. The first father fell asleep, you notice, before the blessing which can alone make it worth his while to wake again came to him, and became the first mother. The great ancestor of Israel wakes from a deep slumber, and is satisfied once for all about his future, which up to this time had been hidden in a mist. And Jacob sleeps alone on the hills far away from his house and his people, and there is a blessing for him in the slumber which was not in the watching. So they go on sleeping through the books and centuries in those old Bible times, while by history and prophecy, by psalm and proverb, we are shown how a spark smitten out of sleep can kindle and renew the most potent forces of life. To sleep well, to their mind, is to do well, and it is a more gracious condition, when the right time comes, than to be ever so wide awake. Yet it is curious and suggestive again to notice how, with this pleading of the Bible on the side of sleep, there has been a perpetual fight with it on the part of a great many who would be the last men in the world to allow that they held the grand old book of small account when it does not fit their humor.

"Very good men, in their own way of being good, still seem resolutely to forget the hints which come to us in the Bible, of the way God has compassed some of his most delicate and far-reaching providences while men slept. How Abraham was confirmed then, and Jacob comforted, Daniel instructed, Joseph warned! How Saul was succored and directed while he slept, and Peter saved from becoming a mere bigot! How the Psalmist sings of God giving to his beloved sleep, and in the oldest sacred poem there is a solemn and beautiful instance of the truth that God speaks, when deep sleep falleth on some man, that he may keep back his soul from the pit. Sleep is still something to be cried down to a good many pious souls, and to be reduced to a minimum. 'Lord,' they seem to say, 'if he sleep, he shall not do well.' They do their best to show that no good wholesome sleeper shall enter the kingdom of Heaven. Now, we have good ground, I think, for quite another conclusion in the help which science brings us. First of all, towers a true understanding of this noble function through which, indeed, she is reversing the judgment of the saints and teaching that as we sleep as when we wake we may do well; that as a rule, subject to such variations as lie within each nature, a good, quiet, restful sleep of, say, eight hours is in its own way holiness, while not to sleep so much as that, if we need as much, is a sin; so that a man like Baxter, with his nervous organization and perpetual wear and tear, ought to have blamed himself because he slept so little, and said to himself steadily, 'I shall be a better Christian and a better man every way, if I can sleep more, so I will strive after this blessing as I strive after truth and holiness.' Because this is beyond all question true, to begin with, that a good sleep is in the best and truest sense that grand attainment, we have come to call it *re*-creation.

"In our active and troubled day the books tell us the pulse beats faster and faster, and that the torrent of life increases all the time in volume and intensity. Action, conflict, thought, labor, care, demand fresh efforts; and through all this and by it all, as when with file and sandstone you work at some delicate piece of machinery, so all day long

through this process the fine tissue of life is ground. The finest ideas of the painter reach back into the finest organism of his life, and draw on these for the picture as well as on some higher power; and the immortal numbers of the poet are born also of a mortal body. Yes, and as the body is, so are the numbers; so that Pope could no more write like Tennyson, or Byron like Wordsworth, or Herrick like George Herbert, than grapes can grow on thorns or figs on thistles. All day long there is a guardian angel bending over these fine tissues and substances of life, to see that they shall not be wasted beyond the line at which they can be made good again when God giveth his beloved sleep. So when the true time comes, if we are wise to hear the angel, he whispers his word and breaks his spell, and we enter—not into the shadow of death, for that is a wretched mistake—but into the portals of a new life, and then these exhausted and wasted frames, fevered and feeble by the long, hard day, feel the touch of renovation if our sleep is that which God has ordered it. No good man will try to save his soul at the cost of so badgering his body.

"We beat back the affluent mercies which come to our saving through sleep; use eyes, nerves, and brain with a savage energy, against which there is no more defense; eat up principal and interest together; and so we drive on until the team breaks down utterly. Then we send for our doctor to set us right, and he makes his diagnosis and says 'tis nervous prostration. He calls it a sickness: God calls it a sin. And we should teach this to our children, for if they are healthy they cannot oversleep themselves. The children must not be tormented with the idea that all the sleep they need is either a sin or a shame. Do not rob the children of even the fringes of this fine robe which falls on them out of Heaven. And you, young men, you think you can racket around into the small hours, snatch a brief slumber, and be just as good as ever. It is not true. Many a man in our great cities, reckless and ruthless with his youth, sells his birthright in this way, and cannot get it back again though he seek it with many tears. So you men in the thick of the world's business, you cannot make money by sitting up nights.

"It is the instinct of your headlong revivalist to keep late hours. The main stress of the fever begins about the time when we should go to sleep, and there is not much done in the way of converts until by this pure and true law it is about time to quit doing anything. And I can well remember when I was in vortices of revival in the old days how I would preach sermons overnight I could not make good in the morning—could not for the life of me feel so sure of perdition at eight in the morning for my unconverted shopmates as I did at ten the night before, while I had far brighter hopes of Heaven, and I used to think that faith had gone out of me while I slept. Good Christian work, like all other work, is best done in the daytime. We are very literally children of the light and of the day."

Ice from Stagnant Water.—As the season of the year is fast approaching when the annual ice-harvest is garnered in, it may be well for us to remind our readers of the fact that ice, as well as water, may be seriously contaminated by filth. It is a mistake to suppose that water will freeze pure, as is generally believed. If the water is impure before it is frozen, it will be impure also in the form of ice. A writer in the *American Naturalist* has been making microscopical examinations of ice from stagnant water, with the following results:—

"The plan adopted has been to select only those fragments taken from the interior of blocks which appear clean and transparent to the unassisted eye. On melting these fragments, and examining the water thus obtained with various magnifying powers up to 900 diameters, bits of vegetable tissues and confervoid growths are usually recognizable at once. I have not noticed animalculæ in an active state in water from ice that has just been melted; but, upon allowing such water to settle and become warm at the ordinary temperature of a room occupied for living purposes, the sediment deposited may be found to contain, after some hours, monads whose movements are easily discernible with a magnifying power of from 200 to 400 diam-

eters. Upon allowing the water to stand still longer, I have found the confervæ growing thriftily, and, in some instances, forming clusters or bundles frequented by minute animalculæ, the entire appearance in this case being similar to that presented by the nests occupied by the young of the common *Paramecium* which I have seen in stagnant water. As the result of these investigations, I am fully convinced that freezing does not free water from filth due to the presence of sewage or decaying vegetable matter; and further, that it is altogether probable that the germs from which animalculæ are developed, if not the animalculæ themselves in a quiescent state, are present in very much of the ice taken from stagnant water. This being the case, it would seem that the use of such ice in drinking water is hazardous, to say the least."

Danger from Glanders.—Many people are not aware that glanders is a disease almost certainly fatal. It most commonly affects the horse, but is communicable to man. The increasing frequency of the disease in horses makes it important that the public should be warned upon the subject. Dr. H. B. Baker, Secretary of the State Board of Health of Michigan, has contributed a very valuable paper on this subject, which ought to be read by every person who has anything to do with horses. The following paragraph from the *St. James Gazette* contains very sensible suggestions on this subject:—

"A surgeon in the German army calls the attention of officers and soldiers, and of all who have to do with horses, to the danger of using the pocket handkerchief to wipe away any foam from the mouth or nose of a horse, which may have been thrown upon their clothes. Some months ago, the writer states, an officer came to him suffering from an obstinate cold and cough. The usual remedies were prescribed, but in vain; a visit to the baths at Reichenhall also did the patient no good. Returning to duty, the officer became worse; fever, attended with great pain in and swelling of the head, set in, and ultimately, after much suffering, he died with every symptom of glanders. Inquiries were set on foot, and it was found that some time before he was taken ill he had ordered a horse, which he believed was suffering from glanders, to be shot. Neither the groom nor any of the other soldiers who had been near the horse has been attacked by glanders, and consequently it is suspected that the officer who died may have conveyed the disease into his system by using his handkerchief to wipe from his uniform some of the foam which came from the mouth or nose of the horse."

Hard Water in Cookery.—A recent number of the *Caterer* contained the following statement of the results of a long series of experiments made for the purpose of determining the effects of hard water in cookery, by a celebrated cook. The statement was made by the investigator himself before a "General Board of Health," and shows very clearly that hard water is indirectly as well as directly detrimental to health:—

"In boiling cabbage, greens, spinach, asparagus, hard water gives them a yellow tinge, especially French beans; hard water shrivels greens and peas, and this is more particularly noticeable in the case of French beans; the process of boiling is also longer, and more fuel is required; with dry vegetables certainly one-fourth more time. I do not think it acts so much upon potatoes, but still it has an influence upon all sorts of vegetables. I do not see the same effects, however, upon roots generally as upon leaves. Hard water does not open the pores of salt meat so freely as soft water. On fresh meat it likewise has a prejudicial effect, but not equal to that on vegetables. It has the effect of making very white meat whiter than does the soft water; upon all delicate things it has, however, a more marked effect; for example, in making beef-tea, chicken or veal-broth, or upon lamb; and the more delicate the substance is, the greater is the influence of hard water upon it. Hard water, as it were, compresses the pores, whilst a soft water dilates them, and extracts the succulent matter which they contain. The evil of hard water is more visible in small quantities, such as broth or beef-tea. It will be more prejudicial or expensive in domestic cookery, which must be in small quantities. In the larger operations, where there is much boiling, and for a

long time, the boiling itself reduces the hardness.

"I have not had practical experience in bread-making; but there is not the least doubt that soft water is of the greatest importance, as making the best bread. This is exemplified in Paris, where the water is hard, and where bread which is made in imitation of Conness bread, though made with the same flour and by the same bakers, never equals that made at the place itself, where the water is soft. I am informed that part of the water at Glasgow is very soft, and that the Scotch bakers from thence, when they first come to London, cannot understand why the bread does not rise so well as in Glasgow, even though they make use of the same yeast and flour."

Trichinosis on a School-Ship.—It is reported that an outbreak of trichinosis has occurred on an English reformatory school-ship, as the result of eating pork imported from America. The symptoms were so nearly like those of typhoid fever that the real nature of the disease was not at first detected. It seems to us that authorities in charge of such institutions as school-ships, houses of correction, prisons, and charity and penal institutions generally, ought to be held responsible for the character of the food supplied to those under their care. The detection of trichinæ in pork is not difficult; and the increasing frequency of infection by this parasite makes it really criminal, in our opinion, for those in charge of the dietary of a large number of persons to expose them to the terrible effects which result from the invasion of the system by this parasite. The obtuseness which will allow people to continue to use as food the flesh of an animal which is so notoriously subject to disease that its use was positively prohibited by the Mosaic law, is quite incomprehensible.

An Unsound Argument.—While we do not recommend vegetarianism for everybody, we are personally convinced of its advantages by fifteen years' experience; and as the present prospect is that animals which furnish a large proportion of the flesh-food eaten are rapidly becoming so generally diseased that self-protection will soon compel a great restriction of the use of animal food, it is important to know that vegetable food contains all the elements of nutrition required for the perfect development and maintenance of the race. One of the arguments which has constantly been urged against a vegetable diet is that animal food is essential to the multiplication of the species, and that the race would soon become extinct if confined to a vegetable diet. There are many facts which show the error of this statement, but none are more telling than the following, to which "Doubleday" calls attention in his "True Law of Population:"—

"Populations are universally found thin in pastoral countries, where the food is chiefly animal; denser where it is mixed; still denser where it is vegetable but plenteous; densest of all where it is vegetable and scarce." "In the poorest times, Irish families subsisting on potatoes and meal averaged seven, against five in England and three in France. In rice-eating countries the population is dense."

Consumption in Fowls.—It has long been known that cows, sheep, hogs, and other domestic animals, are subject to consumption as well as human beings. It has recently been quite clearly established that what is known as pearl disease, a very common malady among cattle in most civilized countries, is identical with scrofula, which is closely allied to consumption, if not identical with it. It has recently been shown that common domestic fowls are also subject to the very same disease, it being in hens familiarly known as "gapes."

When we connect with the above facts the further fact that tuberculosis is a contagious disease, and is particularly communicable through the use of the flesh of a diseased animal, it becomes very evident that too much care cannot be exercised in the selection of healthy animals for food, if animal food must be employed. It should also be remembered that milk from consumptive animals may communicate the disease. Whether or not tuberculous disease may be communicated by the use of eggs from consumptive hens is a question which has not yet been determined.

NOTE FROM A SUBSCRIBER.

ED. GOOD HEALTH: Your interesting article on the "Adulteration of Sugar," in the last number, leads me to ask if granulated sugar is likely to be less adulterated than the common coffee sugar. Believing it to be, for two or three years I have made use only of the granulated, melting it always for syrup. If this, too, is generally impure, I must take the alternative you propose, and go without, assuming that I have pluck enough, for it requires not a little in one brought up in sight of fine maple groves and accustomed the year round to their delicious products. But this does not quite satisfy me; for, having imbibed something of the Sanitarium spirit of caring for others in the matter of health, I am continually casting about for measures to prevent the fraud. What can be done? A magazine article; individual abstinence; careful tests of every article purchased, by those competent to make them,—all are good as far as they go; but in a nation they effect comparatively nothing. If the practice of making poor starch and selling it for sugar, increases among dealers in the ratio your article indicates, as a nation of dyspeptics we may change the epitaph written for Americans of the eighteenth century,—

"Here I lie killed by pie,"

and adapt it thus to the nineteenth,—

Here I lie killed by bad starch!
To the same place, all sugar-eaters march.

S. A. C.

In answer to the inquiry about granulated sugar, we will say that the best quality of granulated sugar, what is called "crown A," is seldom adulterated. All the specimens of this kind of sugar we have examined were pure. The adulteration of food is a crime which ought to be punished with sufficient severity to frighten offenders out of the nefarious business; but we cannot hope that anything effective will be done until public opinion becomes educated to a point that will demand attention to this subject from our legislators. In a recent issue we called attention to the happy results which had rewarded the efforts of a Massachusetts gentleman whose attention was called to the adulteration of vinegar by an article in this journal. If others would go and do likewise, we might soon have a vigorous reformation started.

Parasites in Fish.—Some time since, considerable excitement was caused by the fact that trichinæ had been found in a pike which was caught near Ostend. Dr. A. Elendenin, of that town, examined the fish under the microscope, and found it to be full of these dangerous parasites. It is believed that a troop of these ravenous and omnivorous fish had devoured some of the matter poured out from the outfall at Ostend, and that the parasites had thus found their way into their system.

It has also been shown that fish often contain the embryos of a variety of tape-worm. In view of these facts it is evident that as much care is needed in the selection of fish for food, as in the use of any other kind of animal food.

Cold-Weather Suggestions.—The following facts respecting heating and ventilation, from *The College and Clinical Report*, are of special interest at this season of the year:—

"One square foot of glass surface will cool over one cubic foot of air per minute from the temperature of the inner to that of the outer air. A single glass window, six by three feet (supposed to be air-tight), will thus cool by contact one hundred and eight cubic feet per minute, when the outer air is at 0°, the inner at 60°; a dead loss of fuel. This, if saved, would suffice to warm fresh air more than sufficient for ten persons, or to enable the windows of the room to be thrown wide open for fifteen minutes or half an hour. This is the best practical ventilation for a bed room or sitting-room. It should be done while the room is not occupied, unless in the judgment of the medical attendant a patient may be safely left, if well covered up. The remedy is to be found in hollow walls and double-sashed windows. When double sashes are too costly, double panes, with an air space between, are useful. When transparency is not essential, a tight-fitting frame, over which is stretched some translucent material, as oiled silk or waxed paper, does good service."

LITERARY NOTICES.

OUTLINES OF TECHNIQUE. By Prof. G. H. Howard, Director of the Michigan Conservatory of Music. Olivet, Mich.

In this little work the aim of the author appears to have been to present in a more exact manner than has heretofore been done, the fundamental principles and theory of Technique. It is a valuable work for all teachers and students of music, and the method defined, if followed, must greatly advance the cultivation of correct pianism, and facilitate the labor of both teacher and pupil. We are glad to know that a more complete work upon the same plan is in preparation.

THE HAIR: ITS CARE, DISEASES, AND TREATMENT. By C. Henri Leonard, M. D.: Detroit.

Prof. Leonard has made this work an exceedingly interesting and instructive treatise upon the subject of the hair. Its chemistry, anatomy, and physiology are fully dwelt upon, as well as its hygienic treatment in health and disease. The work abounds with valuable information upon the subject treated. It is illustrated with over three hundred engravings, and written in a style so apt and simple that people in general will appreciate its value as well as the members of the medical profession. The work is designed as an introduction to a second and larger and more scientific work, which the author intends to prepare. The purpose of the larger work is to show the possibility of the classification of animals from the differences in the microscopical structure of the hair.

WRITE YOUR OWN STORIES. Boston: D. Lothrop & Co.

This novel enterprise consists of a book containing thirty pictures for prize stories, with blank pages to write them on. The publishers offer three prizes to the three children under fourteen years of age who shall write on the blank pages the three best sets of stories for the pictures contained in the volume. The book cannot fail to please the children, while it will encourage an interest in the art of composition.

HEALTH AND HEALTHY HOMES: A GUIDE TO DOMESTIC HYGIENE. Philadelphia: Presley Blakiston.

The distinguished English sanitarian, George Wilson, M. D., is the author of the above-named work, and his name alone in connection with the book is a sufficient guarantee of its merits. The book is divided into the following chapters: 1. Introduction; 2. The human body; 3. Causes of disease; 4. Food and diet; 5. Cleanliness and clothing; 6. Exercise, recreation, and training; 7. The home and its surroundings; 8. Infectious diseases and their prevention. The work is written in such a practical way that it can be clearly understood by all classes of readers, and is full of information regarding the care of health and the prevention of disease, which, if carried out, will greatly preserve and prolong life. Although the work is a continuous exposition of domestic hygiene, yet each chapter is complete in itself and may be read as a separate and distinct essay on the subject of which it treats. The volume contains in a small compass a variety and amount of information which renders it well fitted for common household use.

LIFE AND HEALTH. Vinemont, Pa.

We have received the first volume of a new series of this paper, edited by Thos. F. Hicks, M. D. The paper is, as the name indicates, a health journal. The first number is an interesting one, full of practical suggestions upon various subjects pertaining to hygiene and health. We trust the public will appreciate the new efforts of this journal, and give it the support which it merits. Every effort to educate the masses on subjects pertaining to health ought to be appreciated and encouraged.

THE VOICE. Edgar S. Werner, Editor and Publisher: Albany, N. Y.

This is a monthly devoted to voice culture—musical and elocutionary—with special attention to stuttering, stammering, and other defects of speech. It aims to give practical instruction in the use, improvement, and restoration of the voice, in reading, speaking, or singing. Its value is testified to by scores of speech-sufferers and by leading musicians, educators, clergymen, and physicians in different parts of the English-speaking world.

It is thoroughly independent, being in no way connected with any school, institution, teacher, manufacturer, or publishing-house. It is, therefore, no advertising circular, but depends for support solely upon legitimate journalistic patronage. Its contributors include leading specialists of the voice, in America and in Europe. It is the only journal of the kind published in any language. The public are solicited to subscribe, and to contribute articles. Sketches of the work and lives of prominent living musicians and public readers and speakers are particularly desired.

SCHOOL AND INDUSTRIAL HYGIENE. By D. F. Lincoln, M. D. Philadelphia: Presley Blakiston.

This is the last of the series of American Health Primers, and like all of the preceding ones is full of practical hints upon the subject of which it treats. The author gives considerable attention to the amount of study suitable to a given age, the exercise required, care of the eyes, the proper construction of seats and desks, ventilation of the school-room, and other points pertaining to the principles of health and hygiene. It is a book that teachers and all interested in the education of children should read.

Publishers' Page.

HOME PROTECTION.—A late number of the Lansing *Republican* contains the following unsolicited notice of the "Sanitary Detective," under the above heading:—

"Dropping into the office of the State Board of Health on Friday, we were shown one of the neatest and handiest little articles for every household that we have examined for years. It was a small leather-covered case, supplied with test-tubes, droppers, etc., and containing ten bottles, holding an ounce each, filled with the best approved tests for detecting glucose in sugar, adulterations in syrups, copper in peas and pickles, arsenic in wall-paper, lead in tinware, mineral acids in vinegar, and bad water. The case also contains a printed sheet giving full and plain directions for applying the tests. This perfect little "life-preserver" is the invention of Dr. J. H. Kellogg, of Battle Creek Sanitarium, and is especially designed to accompany his forthcoming "Hand-Book of Domestic Hygiene and Rational Medicine." The high reputation which Dr. Kellogg has achieved as a physician and hygienist is sufficient guaranty for the value of anything bearing his name, and no man in Michigan has done more toward disseminating correct medical and hygienic information among the people."

The *Republican* gives us more credit than we deserve, as we do not claim to have made any discoveries in methods of detecting adulteration. We have simply sought to bring together into a small compass and in convenient form, with simple directions for using, the most reliable tests for the principal adulterations of foods, etc. We are glad to know that the effort is appreciated, and that we were not mistaken in supposing that a real want existed which needed to be supplied. We are also glad to be able to state that Dr. R. C. Kedzie, professor of chemistry in the State Agricultural College, has kindly consented to have the chemical re-agents employed put up at the college laboratory, thus securing absolute accuracy and reliability. It is really unfortunate, but nevertheless true, that the "Sanitary Detective," or something capable of accomplishing the same purpose, is absolutely necessary as a means of protecting life and health, in every household. Although the "Detective" was prepared particularly to accompany the "Home Hand-Book of Hygiene and Medicine," it is sold separately, full directions accompanying each case. Price $3.00.

☞ We would call special attention to the products of the Sanitarium bakery, advertised in another column. This department of the institution is equipped with all the apparatus necessary for making every kind of bread-stuffs in first-class style, being provided with the most approved form of rotary oven, with capacity sufficient to feed two thousand persons daily. Crackers of every sort are included in the various products of the bakery, and those who have tasted the various kinds invariably acknowledge them to be superior to any others made. The oatmeal crackers are delicious. For dyspeptics, no form of bread equals the dyspeptic crackers. Persons whose digestive powers are very weak will find great advantage from the use of the gluten crackers; and flatulent dyspeptics often find a perfect palliative in the carbon crackers. Each of the other kinds of crackers has its advantages. See advertisement for prices.

☞ The Sanitarium still holds its numerous family of patients, having been filled almost to its utmost capacity the whole season thus far, and bids fair to have a full house all winter. Among the numerous patients who have been with us this summer may be mentioned Dr. R. Murray, of Chicago, Medical Director of the Western Division of the Army, with his wife and two sons; Hon. Mr. Craft, of Memphis, Tenn., with his wife, daughter, and three sons; Mr. Dillingham and wife, of Louisville, Ky.; Prof. Munsy, of Goshen, Ind.; Mrs. Ann Eliza Young, with her mother and two sons; and many others equally worthy of mention. Many old patients may be glad to learn that our old friend, Capt. Hubbard, has arrived and gone into winter quarters as usual.

☞ The Sanitarium has lately added to its various other departments a fruit-drying establishment. The process employed is the most recent and improved, known as the "Williams Process." The quality of the fruit produced is really superior to that produced by the Alden. The apparatus is now turning out about one-half ton of dried fruit daily, of most superior quality. The fruit will be put up in lots of 50 lbs to 100 lbs., and will be shipped to all parts of the country at the very lowest market rates.

☞ Agents are doing well canvassing for the Home Hand-Book. One agent recently took one hundred orders in thirteen days and four hours. Few can do as well as this, but men and women of fair ability can make better wages than at almost any other business, besides doing much good.

☞ The Eureka Ventilator, advertised in this number, is all that it is recommended. We have used it in our office for two years, and in the coldest weather it secures for us an abundance of pure air without any draft. We would not be willing to do without it.

☞ One of the most convenient little articles for travelers we ever saw is the "Pocket Filter." It enables its possessor to obtain pure water at all times, and is thus a most complete protection from one of the most dangerous classes of disease.