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*** START OF THE PROJECT GUTENBERG EBOOK ELLIS'S PRIMARY PHYSIOLOGY; OR, GOOD HEALTH FOR BOYS AND GIRLS ***

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ELLIS'S
PRIMARY PHYSIOLOGY

OR

GOOD HEALTH

FOR

BOYS AND GIRLS

BY

EDWARD S. ELLIS

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Nothing need be said concerning the importance of the study of good health. The first lesson that a child should learn is the law of his being. Hitherto the aim has been mainly to train the mind regardless of the requirements of the body. The vital connection of the two has been ignored with a persistency little short of criminality.

Anatomy, Physiology, and Hygiene have their places in the curriculum of our leading schools, but the knowledge too often is simply technical and without practical results. What greater travesty than to listen to a glib discourse on nutrition, digestion, circulation, respiration, the muscles, nerves, bones or brain by a pupil with thin chest, lack-lustre eye, sallow complexion, and weak frame?

With no wish to slight the value of a thorough knowledge of Physiology, this little volume seeks to give the fundamental laws of health, in such simple language that every boy and girl advanced enough to read, can understand them. Accompanied and supplemented by the earnest words of the teacher, who shall estimate the good that may be accomplished?

In the preparation of these pages, the author is glad to acknowledge the valuable assistance received from C. Shepherd, M.D., Superintendent for many years of Public Schools, Trenton, N. J., and Washington Hasbrouck, Ph.D., Principal of the New Jersey State Normal School.



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It is your bounden duty to instruct your pupils in the laws of health. If you fail to do so, you are not fit to be their teacher.

The vices of cigarette smoking, of tobacco chewing, of beer and alcoholic drinking, threaten the very existence of the rising generation. You cannot be too earnest and persistent in impressing this truth upon the boys who look up to you for counsel.

You need not be reminded that the most powerful teacher is your own example. Boys respect and admire manly vigor. You ought to be able to outrun, outjump, outthrow, outswim, outwrestle, outspar, and outplay, at all points, the largest and most active boy in school. Many a teacher, when he attempts to take part in an athletic game, becomes the laughing-stock of the youngest urchin, by reason of his flabby awkwardness.

10

While our youth often need to be restrained rather than encouraged to cultivate their muscles, yet they should be told to play when the opportunity is theirs. You ought to take the lead in their games. Your eye should be as bright, your sight as true, your cheeks as rosy, your step as elastic and your physical prowess the equal at least of any lad in school.

All the text-books in the land are less effective than a few timely words from you. Occasions are continually presenting themselves which should be utilized. When a boy has been playing too violently, or when he neglects play, when he is careless as to his clothing or shows evidence of falling into any bad habit, a kind but pointed warning will accomplish more than weeks of study.

11

There are other dangers to which boys are peculiarly exposed, and which obviously cannot be referred to in these pages, concerning which it would be criminal for you to remain silent, but in all such cases, your warning must be uttered to the offender in private, or by the father to whom you may make the suggestion.

Of course you will see that the school-room is properly warmed and ventilated; that the pupils are kept out of all drafts; and that the air is as pure as possible. The faithful teacher will find almost hourly opportunities for impressing these vital truths upon the children, and, only by doing so to the fullest extent, can he approach a proper fulfillment of his own mission as the friend, counselor, and guide of the coming generations.

12

TO THE FEMALE TEACHER.

13

What has been said to your co-laborer about assuming the lead in observing the laws of health, applies with equal force to you. Your experience and knowledge give you invaluable opportunities for instructing the girls in what is truly the great question of life and death.

Cleanliness, clothing, food, and all the subjects treated of in the following pages, should be supplemented by the practical illustrations which the girls themselves continually present. No observant teacher can have failed to become acquainted with the rudimentary laws of her being, and to none is given so golden an opportunity to make that knowledge a living truth as to her whose calling it is to instruct the future mothers of our country.

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WHY THE LAWS OF GOOD HEALTH SHOULD BE STUDIED.

Every boy and girl ought to live a hundred years. When worn out at last by old age, death will come like sweet sleep, without pain, or suffering.

No one can live very long, unless he obeys the laws of health. These laws are so simple that all can learn them. Many people remain ignorant of them until they grow to be men and women, when they find it too late to escape the penalty which nature visits on those who break her laws.

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One of the first things that boys and girls should study is how to keep the health which their kind Creator has given them. Such knowledge will save them days and nights of suffering and perhaps bring them many years of enjoyment.

Children give little thought to the care of their bodies, and often form habits whose ill effects are not seen for a long time. Let them, therefore, try to learn, in early life, what is right and wrong in this respect.

It is not a hard study. What is more interesting than to learn about the most wonderful machine in the world? That machine is yourself. There never can be any invention to compare with it. God alone can create it, and it is your duty to do all you can to keep it running until worn out.

17

Anatomy is the study of the structure or make-up of our bodies. Physiology tells of the offices or purposes of all the parts of our bodies. Hygiene, or Good Health, is the knowledge of the laws by which all the organs and parts of our bodies are kept in the best possible condition.

How long ought every boy and girl to live? What is said of death from old age?

What is necessary to secure long life? Are these laws simple? What mistake is made by many people?

What should be one of the first things for boys and girls to learn? What will such knowledge save them?

What do children do? What, therefore, should they try to learn?

Is it a hard study? What is the most wonderful machine in the world? What is your duty?

What is Anatomy? Physiology? Hygiene, or Good Health?

CLEANLINESS.—BATHING.

One of the first things to remember is the need of keeping your bodies clean. Of course you wash your hands and face as soon as you rise in the morning, and if necessary through the day, but that is not enough.

The skin is composed of two layers, the outer or scarf skin and the inner or true skin. The outer is continually wearing out and falls from the body in fine scales. The skin is pierced by thousands upon thousands of pores, or tiny openings, through which a large part of the waste of the body passes. If these pores are allowed to become clogged by want of cleanliness, the waste matter enters the blood and may cause disease and death.

The way to keep the pores open is by bathing or cleanliness. When the weather is cold, you should bathe at least once a week at home. The water should be moderately cold. After bathing, rub yourself from head to foot with a coarse towel until the skin becomes warm and red. Then dress quickly and do not go out-of-doors for half an hour.

During summer it is well to bathe every day. Salt water is better than fresh. Boys are fond of bathing and are inclined to spend too much time in the water.

Avoid stagnant or impure water. Running streams, ponds into and from which water continually flows, creeks, rivers, lakes, and the ocean afford good bathing.

Do not bathe when the body is overheated or you are perspiring freely, or within two hours of breakfast, dinner or supper. Stay in as long as it is pleasant, but come out before you begin to feel chilly.

In entering, it is best to plunge at once under the surface. If you walk slowly, as many timid people do, until the water gradually reaches your neck, you leave the brain heated too long. It ought to be cooled at the first.

After bathing, rub your body dry and dress without delay. Do not lounge on the shore in your bathing dress. If you do, the body becomes chilled, and ill results are likely to follow.

What is one of the first things to remember?

Of what is the skin composed? What is said of the outer skin? What of the pores? What follows if the pores are allowed to become clogged?

How can the pores be kept open? Describe how one should bathe when the weather is cold?

How often is it well to bathe during summer?

Which, is the better, fresh or salt water? What are boys apt to do?

What should be avoided? What affords good bathing?

When should you avoid bathing? How long ought you to remain in the water?

What is the best manner of entering the water? Why?

What should be done after bathing? What should you avoid? Why?

DRINKING.

Many diseases of the body are caused by what we take into our stomachs. You can see, therefore, how important it is that we should know what and how to eat and drink.

TEA, COFFEE, MILK, AND CHOCOLATE.

If I say that tea, coffee, and chocolate are poisonous, and that they shorten life, you will smile and shake your head. Very likely some of you have kind grandmothers who have drunk tea all their lives and still enjoy good health. Perhaps your father is fond of his coffee and feels no ill effects from its use.

No doubt it would be better for all if only water was drunk, but it cannot be said that a temperate use of tea, coffee or chocolate and what are known as temperance drinks, are injurious. Milk is a drink of nature, and therefore excellent, though it does not agree with every person.

WHEN AND HOW TO DRINK.

If you have formed the habit of drinking while eating, stop it at once. At first your mouth will be dry and your thirst great, but persevere and in a short time you will not feel the least desire to drink until you have finished your meal, when a few swallows will be all you wish.

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Nearly every one drinks too much. If you are thirsty, you fill a tumbler and drink its contents and sometimes take even more than that. Now if instead of doing so, you sip the water slowly, your thirst will be gone before half the water is consumed.

An hour or two after a hearty meal, you may feel a slight degree of thirst. This is caused by the digestion going on in the stomach. If you drink, you will soon be thirsty again and will be forced to drink often through the day; but, if you refrain, at first, the thirst will soon depart and will not return for hours.

During warm weather, or when perspiring from exercise, you need more water than at other times. Even if very cold, it will do no harm, if slowly sipped. Many people learn to like warm water, which is more healthful than cold.

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LEMONADE, ROOT BEER, SODA WATER, ETC.

Pure soda water, lemonade, root beer and similar drinks are not hurtful, but the sugar they contain increases our thirst and leads us to drink more than is good for us. Water is the provision of nature, and though it has no color, taste or smell, nothing in the world is so delicious and refreshing.

Very hot and very cold drinks are hurtful, but much of the ill effects may be averted by sipping them as I have already advised. Few will believe until they make the test, how little water is needed through the day. The less we take the more comfortable will we feel.

How are many diseases caused? What, therefore, is important?

What have you to say about tea, coffee, and chocolate?

What of a temperate use of those and of temperance drinks? Of milk?

What have you to say of the habit of drinking while eating?

What does nearly every one do? What is the best way to drink water?

What should be done when slightly thirsty an hour or two after a meal?

When do you need more water than at other times? In what manner may very cold water be drunk without harm?

What of warm water?

What is said of soda water, lemonade, etc.? What of water?

What of very hot and cold drinks? What will be the effect if we drink only a small quantity of water?

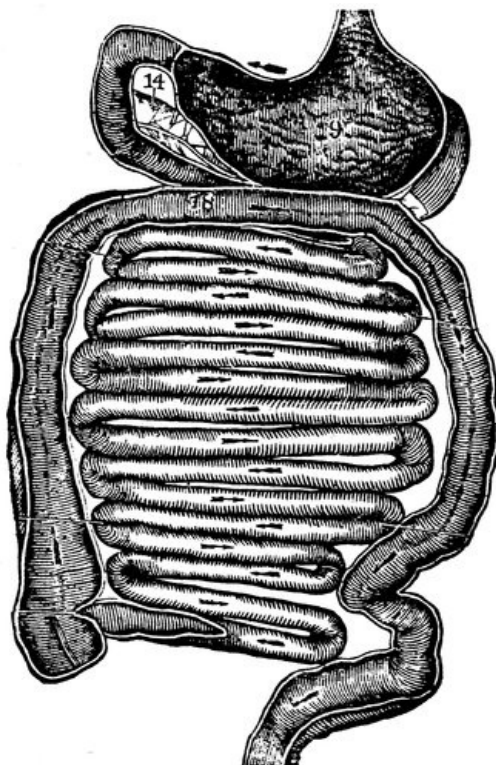
EATING.

Always eat slowly and do not swallow your food until it is chewed to a pulp. The glands inside the mouth give out enough saliva to moisten the food and fit it for digestion in the stomach. Children love to soak their bread in coffee, or to sip the coffee while eating. By doing so they stop the flow of saliva and weaken a fluid which digests the food in the stomach.

WHAT BOYS AND GIRLS SHOULD EAT.

In the way of food, bread and butter, well cooked meat, and fruits not too green nor over ripe, should form your principal diet. Pies and cakes are injurious, and if you eat them, do so sparingly. Never ask for a second piece.

28



THE STOMACH AND INTESTINES.

Fat meat and butter cause heat and often make the blood gross. Such diet is improper during warm weather and, therefore, we do not crave it. If we lived in the arctic regions, we would soon learn to drink oil like water, and to eat tallow candles as though they were pieces of crisp celery.

Highly seasoned food should not be eaten. It may be salted to suit the taste, but pepper is harmful.

29

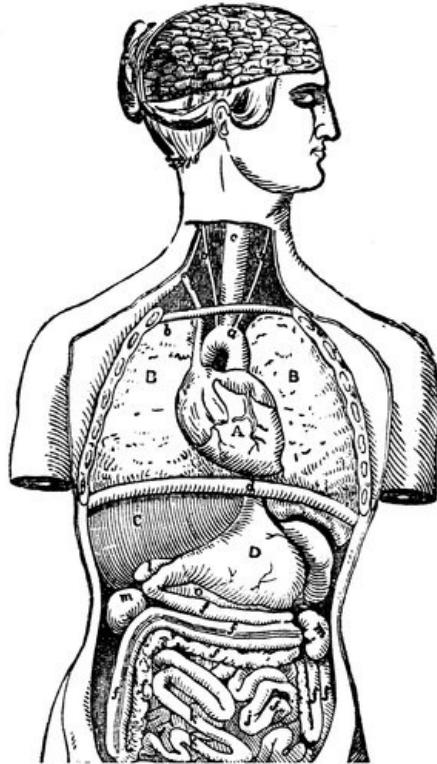
WHEN AND HOW MUCH TO EAT.

Eat nothing between meals, which should always be at regular hours. Partake sparingly of sugar, candy, and sweetmeats. In eating the meat of walnuts, filberts, chestnuts, etc., use salt.

Children, like some grown persons, are apt to eat more food than is good for them. You have heard people say that you ought to leave the table while still hungry, but if that is true, there can be no need of sitting down to eat. The true course is to cease eating, while you still have a relish for food.

CHEERFULNESS AND APPETITE IN EATING.

The table is not the place for argument or dispute. The conversation should be cheerful, and all should try to be happy. Do not begin any kind of work, physical or mental, until fully a half hour after the meal is finished.



*Showing the position of (A) Heart,
(B) Lungs, (C) Liver, (D) Stomach,
(f, j, etc.) Intestines.*

Eat very little if the mind is excited, and do not eat at all, if you do not feel hungry. Never coax the appetite. Do not eat heartily within a few hours of bed-time.

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If your appetite is poor, it is well to omit the last meal of the day. One of the best medicines in the world is a scant diet of wholesome food. Overeating and fasting are hurtful.

Remember that that which agrees with one may disagree with another. Rice is one of the most easily digested articles of food, and yet some persons cannot retain it on their stomachs. Your own sense will soon tell you what best agrees with you. Follow the advice of your parents, who know what is good for their children.

In what manner should we eat? Why? What bad habit are children likely to form?

What should constitute our principal diet? What is said of pies and cake?

What is said of fat meat, butter, and greasy food? How would our tastes change, if we lived in the arctic regions?

What is said of highly seasoned food? What is said of salt and pepper?

Of eating between meals? Of sugar, candy, and sweetmeats? How should nuts be eaten?

What are children apt to do? What is the true course?

What of argument and dispute at the table? What advice is given?

What should be done if the mind is excited, or you do not feel hungry? Should the appetite be coaxed?

Suppose your appetite is poor? What of overloading and fasting?

Is the same kind of food good for everybody? How can you learn what is best to eat? What advice should be followed?

THE HAIR, EARS, EYES, AND FEET.

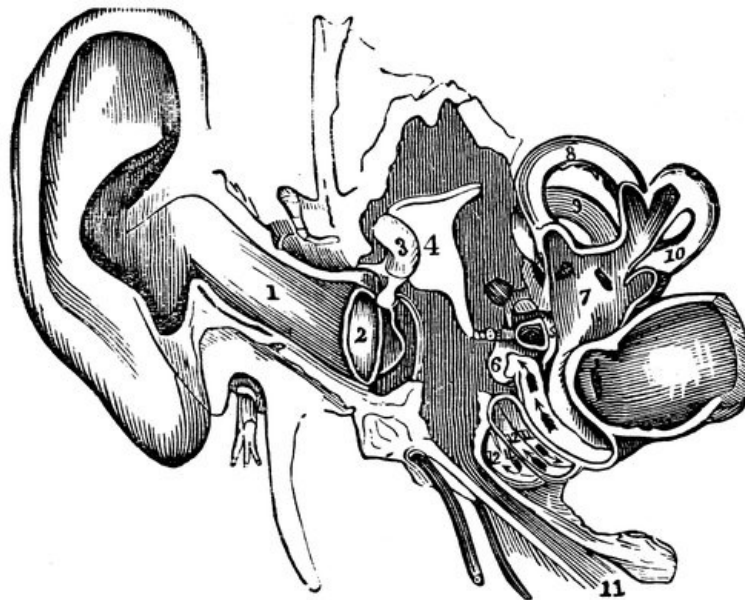
The hair needs little attention. A boy should not wear it long and it should be carefully combed and brushed. Girls who let theirs grow longer should have it frequently clipped, as it gives it vigor.

Never put oil or grease on the hair, for it catches and holds the dirt in the air, soils clothing, clogs the pores at the roots, and tends to produce baldness.

If you will brush your hair vigorously for several minutes every morning, it will soon acquire a gloss and look better than if smeared with pomatum. The odor will be pleasant and the hair will not ruin articles and clothing with which it comes in contact. Now and then it is well to clean the hair with Castile soap, warm water and a strong brush. Shampooing is excellent.

Hair is a non-conductor of heat,—that is, very little heat or cold can be made to pass through it. It serves as a protection to the brain. While a great many men are baldheaded, you very rarely see a woman thus afflicted. This is because they do not wear air-tight coverings for their heads, but the scalp is kept cool and healthy. It is a good thing for children to leave off their hats and caps, except when necessary to protect them out-of-doors.

THE EAR.



THE EAR.—*Showing External Ear and Internal Ear. (1) Auditory Canal, (2) Drum of the Ear, (3, 4, 5, 6) Bones of the Ear, (7, 8, 9, 10) Semi-circular Canals, and Cochlea or Snail Shell, (11) Eustachian Tube, leading to Throat.*

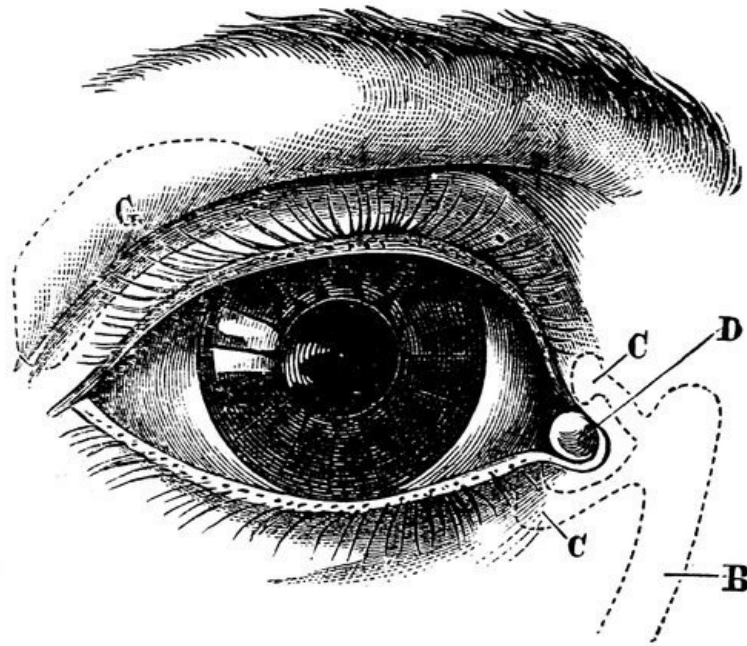
The ears need even less care than the hair, for that which is called by the name, is only the covering of the true ear. Every boy and girl will make sure that when the face and hands are washed, the neck and ears are not forgotten. The shape of the outer ear causes it to catch many of the particles always floating in the air. These can be easily removed with the end of the forefinger, covered by a portion of a moist towel.

Do not pick the ears. The wax is placed there by nature for a wise purpose. It keeps out dirt and insects and protects from injury the delicate organs of the true ear within. If the wax becomes too abundant or hard, it can be easily removed with the forefinger. If anything more is required, go to a doctor.

THE EYE.

The eye is the most wonderful organ of the body, and with simple care can be preserved all through life. Boys and girls who have bright, strong eyes are apt to weaken them by carelessness in their use.

36



THE EYE.—*Showing Iris, Pupil, (G) Tear Gland, (D) Tear Lake, (C) Tear Duct, leading to nose.*

You should never apply water, either warm or cold, to the eyeball. When washing your face, keep your eyes closed, but wash the corners and outer surface. The gummy substance which sometimes collects is thus removed without trouble. It is well sometimes to close the eyes and rub them briskly, just as we feel like doing on awaking from sleep.

37

HOW TO USE THE EYES.

Never strain the eyes by trying to read or examine anything closely when the light is poor. When it becomes an effort to see distinctly, cease the effort at once. A strong glare of light is also hurtful.

In reading or study, do not permit the light to fall on the page from the front. It should pass over the shoulder, the left being preferable. It is well also to wear a shade over the forehead, especially when writing at night, and it is necessary that the light should come from the front, on account of the shadow made by the hands.

When the eyes become weary and the letters or figures begin to dance and flicker, cease work. If a cinder lodges under the lids, do not attempt to remove it by rubbing; that only adds to the irritation. Close the eye and then carefully draw the upper lid over the lower. This will cause a flow of the fluid of the eye which will probably wash away the substance.

If this fails, a friend is not likely to have any trouble in removing the object with the corner of a silk handkerchief. Should he find it impossible to relieve you, go without delay to an oculist.

Sometimes the eyes of children have been weakened by sickness, and it is necessary to use spectacles. When a boy or girl feels any peculiar sensation about the eyes, or they seem to act wrongly, the oculist should be appealed to at once.

FEET.

The feet must be kept clean and warm. Some prefer cotton and some woolen stockings. Use whichever are the most comfortable. Never wear shoes that are too tight. If you do you will suffer in after years from corns and bunions. The nails of the feet as well as of the hand should be kept pared and clean, but their surface should never be scraped.

What is said of the hair? What should be done by a boy? By a girl?

What objection have you to oil and grease?

How can the hair be made glossy? How is that superior to pomatum? How should the head be cleaned?

Of what use is the hair? Why are so many men baldheaded? Why is it rare that we meet a baldheaded woman? When only should the head be covered?

What is said of the ear? How should it be kept clean?

What of the wax in the ear?

What can you say concerning the eye? What is often done by boys and girls?

Tell how the eyes should be washed. What is it well to do now and then?

What is said of straining the eyes? What of a strong glare of light?

What rule should be followed in reading or study? What of a shade?

When should you cease using the eyes? What should be done if a cinder gets under the lid?

What should be done if that fails?

When must spectacles be used, or an oculist consulted?

How must the feet be kept? Which are the better, cotton or woolen stockings? What of tight shoes? What should be done with the nails?

THE TEETH.

Few boys and girls take proper care of their teeth. All of us admire a set of strong, sound, even, white teeth, and those who do not have such, will tell how sorry they are because in youth they were so careless that their teeth were ruined.

The teeth should be carefully cleaned each morning before breakfast. This is best done with a good brush, Castile soap, and lukewarm water. Use none of the numerous tooth-powders sold, and never pick your teeth with a metallic substance. Quill, wooden, or ivory tooth-picks only should be employed.

When the brush does not remove the stains from the teeth, the soft end of a small stick, covered with powdered charcoal will answer, though it should not be used often.

INJURIES TO THE TEETH.

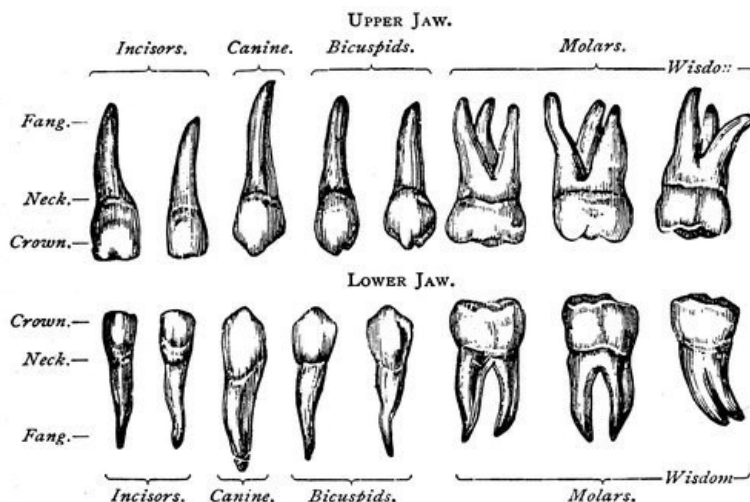
Very hot or cold food, or water, sweetmeats and acids injure the teeth. Children sometimes like to show the strength of their teeth by cracking hickory-nuts and other hard substances. This should never be done, as the nuts and substances may prove stronger than the teeth. The teeth are made of a soft kind of bone, covered with enamel. The bone part of the teeth soon decays if the enamel is broken.

TWO SETS OF TEETH.

The first set of teeth, twenty in number, gradually become loose after a child is five or six years old, and the second set, thirty-two in number, crowds after them. The second are the teeth which are meant to last all our life-time, and they should be guarded, therefore, with the utmost care.

Sometimes the second teeth crowd so closely that the first become wedged in place. The old tooth should be removed, just as soon as the second can be discovered pushing after it. If this is not done, the mouth will be filled with crooked and unsightly teeth.

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THE PRINCIPAL TEETH.

The mother or father of any boy or girl will readily draw a loose tooth, by means of a looped thread. Often, however, a brave child will pull his own teeth, without help. Be on the watch and clear the way for the second teeth. If you don't you will be sorry all your life.

44

Some children have poorer teeth than others, and the utmost care will not save them from decay. When the first speck appears, go to the dentist. Dentistry has made such improvements during the last few years, that the poorest teeth can be made to last a long time.

What is said of boys and girls?

When and how often should the teeth be cleaned? What should be used for that purpose? What is said of tooth-powders and tooth-picks?

How may stains be removed from the teeth?

What substances injure the teeth? What about cracking nuts and other hard substances with the teeth?

How many teeth has a child? A man? When do the second teeth begin to appear? How long is it intended they should last?

What sometimes takes place? What should be done? What will follow if this advice is not heeded?

How are loose teeth generally pulled? Have you ever known of a boy or girl pulling his or her own teeth? What must you watch for and do? Is there any need of such care?

What is said of some children? When should you go to the dentist?



45

MUSCLES.

EXERCISE.

Boys and girls are not likely to believe they need any instruction as to exercise. They are so fond of play that all they ask is a chance and they will use it to the utmost.

That form of exercise is best which brings most muscles into action. It should not be too violent nor continued after one is tired. It should be in the open air, and some kind of game is preferable because it also engages and interests the mind.

TESTS OF SKILL.

Base-ball, rowing, foot-ball, hare and hounds, skating, lacrosse, lawn tennis and similar tests of skill have become so popular in this country that the young need to be restrained from indulging too much in them. After one's school-days are over and a young man takes up some sedentary occupation, he should manage to gain exercise every day.

The gymnasiums afford the best forms of exercise, but boys and girls can walk, run, and use some of the simpler forms of gymnastics at their homes. They should make sure they breathe pure air, that they do not form bad habits, and are regular in everything daily required of them.

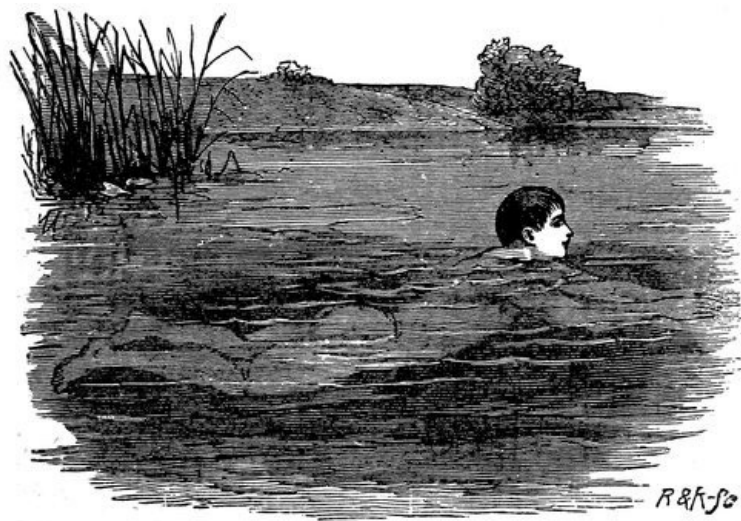
What form of exercise is best? What should be guarded against? Where should it be? What is preferable?

What games are popular? What should every boy do, after his school-days are over?

What of the gymnasiums? What can be done by all boys and girls? Of what should they make sure?

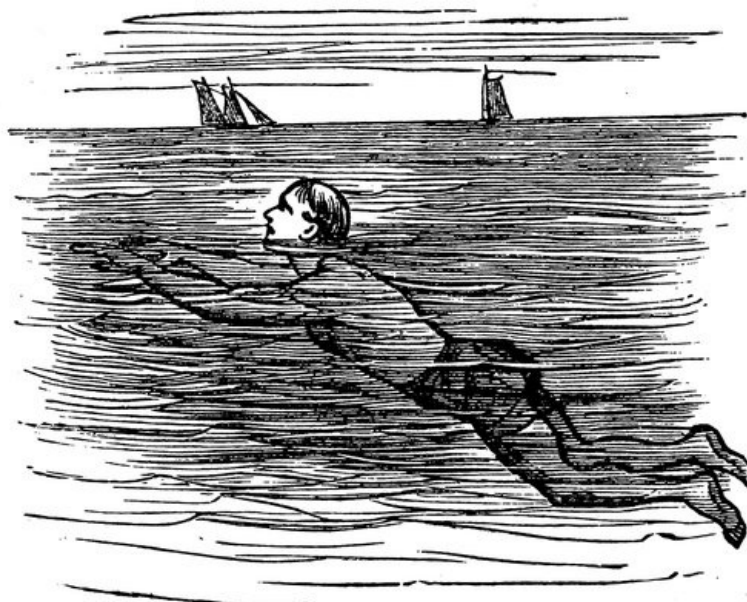
THE ART OF SWIMMING.

Every boy and girl should learn to swim. Instances are likely to arise, where a knowledge of the art will not only enable you to save your own life, but that of some dear friend.



When ready to take your first lesson in swimming, plunge into the water until the head and body are cooled. Then, standing where the water reaches your waist, lie down gently on your face, head erect as if walking, with the mouth just above the surface. Lift your feet from the bottom and strike them out in imitation of a frog. At the same instant or a second later, throw your arms, palms outward, from the front of your breast, drawing them in and striking out as before.

You will fail a good many times before you learn to swim, but do not give up. You will perhaps swallow some water, and in spite of all you can do, your head will drop more than once under the surface; but, if you will keep trying, you will soon find yourself able to make two, three or more strokes, before you sink. A little practice will complete your mastery of the art.



It is well to use helps at the beginning. A friend may hold up your chin, or a light float may be fastened behind your shoulders. The body of a person is very little heavier than water, and a slight exertion, rightly directed, will keep it afloat for hours.

FLOATING.

The most important step, after learning to swim, is to learn how to float. A skillful swimmer may find himself overtaken by cramp while in deep water. He can turn upon his back and float until he recovers or help reaches him. In case of shipwreck, or where a person is forced to stay a long time in water, he can rest by floating. 52

Taking your position in water, no higher than your breast nor shallower than your waist, you lie very gently on your back, with your chest elevated, your hands on your stomach and your feet extended in a straight line, close to the surface. If you wish to swim on your back, you have only to draw up your legs and strike out as when swimming in the natural position. It is a poor method, however, as you cannot see in what direction you are going, and will soon exhaust your strength.

After learning to swim, there are many fanciful movements which can be easily learned. They have no special value, but afford amusement to those who look on or engage in them. 53

You cannot be too careful while learning to swim. Boys are apt to be venturesome and think their parents are too timid on their account. You should make it a rule never to go into water beyond your depth until you can swim very well. If this rule should be followed the number of deaths from drowning would be greatly lessened.

Why should every boy and girl learn to swim?

Give directions for the first lesson in swimming.

What is sure to follow?

What helps may be used at the beginning?

Show the advantage of knowing how to float in the water.

Show how a person may float.

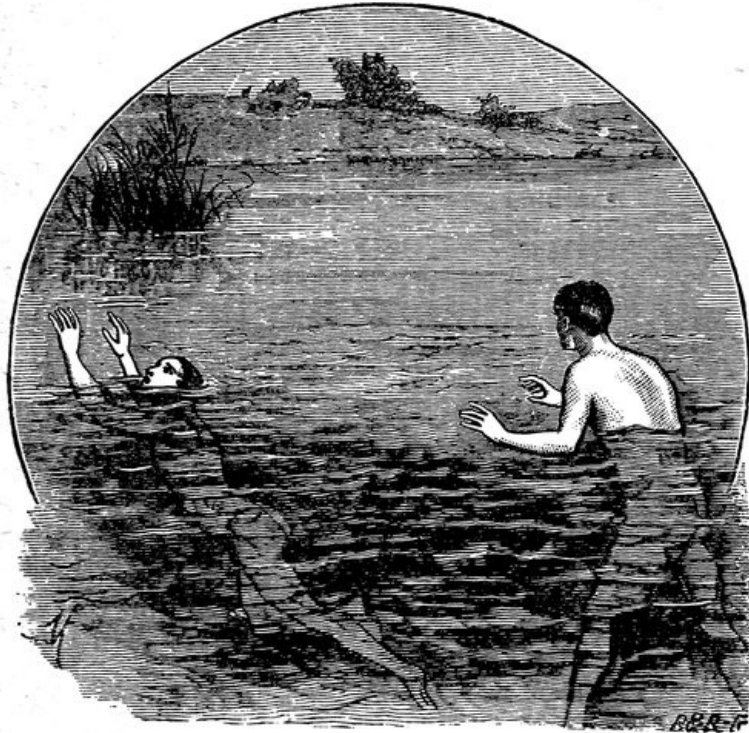
What is said of fanciful movements in the water?

What care should boys exercise?

HOW TO TREAT DROWNED PERSONS.

Many persons are drowned every month, and almost every day. Hundreds doubtless could be saved by a knowledge of the art of swimming, while others could have been revived, had the proper means been used.

When any one believes he is drowning, he becomes frantic and his fierce struggles only hasten his death. If a friend swims to his rescue, there is danger that he will throw his arms around his rescuer and cause both to drown.

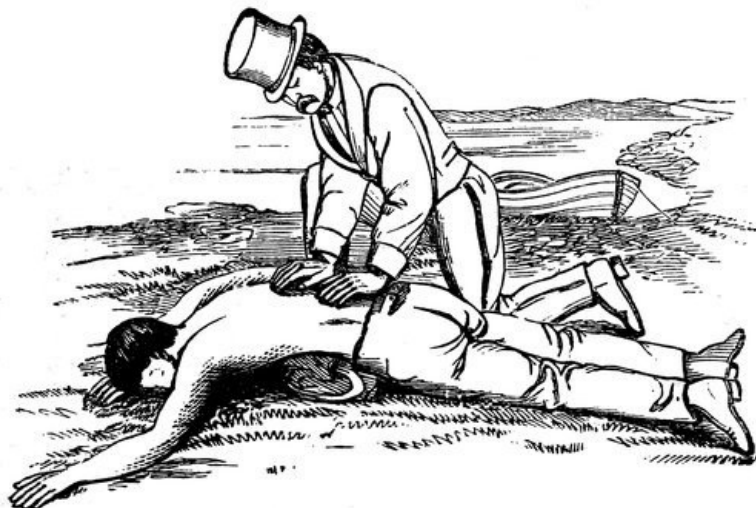


GOING TO THE RESCUE.

If the person in danger will keep still, when his friend seizes his hair or arm, he can readily be taken ashore. If a swimmer finds his sinking friend frantic, it may be necessary to strike him a violent blow between the eyes so as to stun him for a minute or two.

A drowning person generally rises twice before sinking the last time. Those who have been unconscious ten, fifteen, twenty minutes and sometimes longer, have been resuscitated or brought back to life. What is done, therefore, must be done without delay. Should you be present when a drowned person is taken from the water, you ought to know exactly what to do.

If any one can be spared to go for the doctor, let him run with all speed. The instant the body is brought to land, turn it upon the face, with a hard roll of clothing under the pit of the stomach. This roll can be readily made from your own clothing or that of others if present. Put one wrist of the patient under his forehead so as to keep his mouth off the ground.



Then, with your hands well spread upon the patient's back, above the roll of clothing, press down with the whole weight of your body, pushing forward at the same time. Repeat this two or three times, with quickness and vigor. The object of the movement is to force the water from the lungs, and it must occupy very little time, for there is none to throw away.

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Having freed the lungs so far as possible from water, turn the patient on his back, face upward, with the hard roll of clothing beneath his back. Bend the head backward and downward, so that the throat is stretched to the utmost. Place his hands on top of his head, and, if there be any one standing near, let him tie the wrists with a single twist of the handkerchief.

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All the clothing must be instantly stripped off to the waist. Kneel astride the patient's hips; grasp the front part of the chest on both sides of the pit of the stomach, your thumbs pointing to the patient's chin and your fingers fitting into the grooves between the short ribs.

Brace your elbows firmly, making them rigid with your sides and hips, while your knees serve as a pivot. Press the sides of the patient firmly together, throwing yourself slowly forward for a second or two until your face almost touches his and your whole weight presses upon his chest. End this pressure with a sudden short push, which will send you back to the kneeling posture.

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Stop for two or three seconds, so as to allow the ribs to spring back into position. Then repeat this bellows-blowing movement as before, gradually increasing the rate from seven to ten times a minute. Watch closely, and if you detect a natural gasp, do not interrupt it, but as the ribs sink, gently press them and deepen the gasp into a long breath. Continue to give this help, until the natural breathing is fully resumed, but do not cease your efforts for fully an hour or longer.

Avoid impatient vertical pushes; the force must be upward and inward. If a second person is present, he should pull the end of the tongue of the patient out of a corner of his mouth and hold it there, using his handkerchief or piece of cotton rag. This helps to give the air free passage to and from the lungs.

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What causes a great many deaths from drowning?

How does a person act when he believes he is drowning? What is he likely to do if a friend swims to his rescue?

What may be done if the drowning person keeps still? What, if he becomes frantic?

How often does a drowning person generally rise? How long after drowning has a person been resuscitated or brought back to life?

What about the doctor? Now, describe very carefully the first step to be taken the instant a drowned person is brought to land. What should be done with his wrist?

What next should be done? In what manner and how often should this be done? What is the object of the movement?

After freeing the lungs, so far as possible, from water, what is the next step? What should be done with his hands?

What of the patient's clothing? What next should be done?

Having placed yourself astride the patient's hips, describe what should be done next.

What are the next steps? What should be done if a natural gasp is detected? How long should you continue your efforts to restore the patient to life?

What should be avoided? What should be done by a spectator, if there be one?

Now tell me precisely what to do from the moment a drowned person is taken out of the water until he is resuscitated or it is proven he is beyond help. (The teacher must insist on an answer, correct in every particular, for it is evident that unless he knows every step, the pupil's knowledge is useless.)

ANOTHER METHOD OF TREATMENT IN CASES OF ASPHYXIA FROM DROWNING, CHLOROFORM, COAL-GAS, ETC.

The following method is recommended by Marshall Hall, a very high authority on all such questions:

"Treat the patient instantly on the spot, in the open air, freely exposing the face, neck, and chest to the breeze except in very cold weather.

"In order to clear the throat, place the patient gently on the face, with one wrist under the forehead, that all fluid, and the tongue itself, may fall forward, and leave the entrance into the windpipe free.

"To excite respiration, turn the patient slightly on his side, and apply some irritating or stimulating agent to the nostrils, such as hartshorn.

"Make the face warm by brisk friction: then dash cold water upon it.

"If not successful, lose no time; but, to imitate respiration, place the patient on his face, and turn the body gently, but completely on the side, and a little beyond; then again on the face, and so on, alternately.

"Repeat these movements deliberately and perseveringly, fifteen times only in a minute. (When the patient lies on the thorax, this cavity is compressed by the weight of the body, and expiration takes place. When he is turned on the side, this pressure is removed, and inspiration occurs.)

"When the prone position is resumed, make a uniform and efficient pressure along the spine, removing the pressure immediately, before rotation on the side. (The pressure augments the expiration; the rotation commences inspiration.) Continue these measures.

"Rub the limbs upward, with firm pressure and with energy. (The object being the return of venous blood to the heart.)

"Substitute for the patient's wet clothing, if possible, such other clothing as can be instantly procured, each by-stander supplying a coat or cloak, etc. Meantime, and from time to time, to excite inspiration, let the surface of the body be slapped briskly with the hand.

"Rub the body briskly till it is dry and warm, then dash cold water upon it, and repeat the rubbing.

"Avoid the immediate removal of the patient, as it involves a dangerous loss of time; also, the use of bellows, or any forcing instrument; also, the warm bath and all rough treatment."

Describe the first step recommended by Marshall Hall in the case of asphyxia from drowning, chloroform, coal-gas, etc.

How would you clear the throat?

How is respiration or breathing excited?

What should be done to the face?

If not successful in reviving the patient, what should be done to excite respiration?

How often should this movement be repeated?

Explain how respiration is produced by this proceeding.

What is the next step? Explain its meaning.

What should be done with the limbs? What is the object?

What of the patient's wet clothing? What should be done from time to time?

What else is recommended to be done?

What should be avoided?

Now, give every step to be taken in resuscitating persons by Hall's method.

THE MUSCLES.

You are provided by nature with about four hundred muscles. Every one has its special use. They are fastened to the bones, which can only be moved by them. The principal muscles are shown in the figure on page [45](#).

The muscles are generally found in pairs, so that when motion is produced in one direction, another muscle or group of muscles causes motion in the opposite direction.

VOLUNTARY AND INVOLUNTARY MUSCLES.

A voluntary muscle is one which you can control; an involuntary muscle is not subject to your will. Thus, when you move your hand or foot, it is done by a voluntary muscle. Your heart beats without any will of your own, and is therefore, controlled by involuntary muscles.

STRENGTH OF MUSCLES.

A well-developed man can drag a little less than his own weight over a level surface, while a draught-horse can draw only two-thirds. The horse, therefore, is relatively weaker than man. There are some insects, however, which are able to move nearly fifty times their own weight.

From what you have learned about the importance of exercise, you will understand how necessary it is that every muscle should be trained. In no other way can you preserve sound, rugged health.

HYGIENE OF THE MUSCLES.

When the muscles are properly used, they become large, firm, and dark red in color. Such use of them causes the skin to act freely, while the brain is made vigorous and the digestion improved. It is the best medicine in the world. You must be careful not to strain or overwork your muscles, as it is very hurtful. Your strength must be built up by moderate, careful, and regular exercise.

The muscles need not only exercise to make them strong, but a constant supply of good, pure blood. You must eat wholesome food, in proper quantities, at regular intervals.

You must take plenty of exercise in the sunlight. The blood and the muscles demand the light and the heat of the sun to make them strong.

EFFECTS OF EXERCISE.

The effect of exercise upon the muscles may be clearly seen in the arm of the blacksmith; in the foot and leg of the walker; in the fingers of the pianist; and in the hand and fore-arm of the skillful penman.

How many muscles have you? How are the bones moved?

How are the muscles generally found? In what manner do they work?

What is a voluntary muscle? An involuntary one? Illustrate the difference.

Compare the strength of a well-developed man with that of a horse. What is said of some insects?

Why should the muscles be trained? What is the result?

What kind of medicine is such exercise? How must your strength be built up?

What do the muscles need beside exercise?

Where should the exercise be taken?

Show some of the effects.

REST AND POSTURE.

“Early to bed and early to rise” should be your motto. Children need abundant sleep, and ought to retire early and rise as soon as they awake in the morning. Their bodies and brains require regular rest.

Never lie on your back when sleeping, but on the left or right side. Place your limbs in the easiest position possible; otherwise you will be troubled by bad dreams, which will awake you from slumber. Try to keep your mouth closed, so as to breathe through your nostrils. You will thus escape the unpleasant habit of snoring.

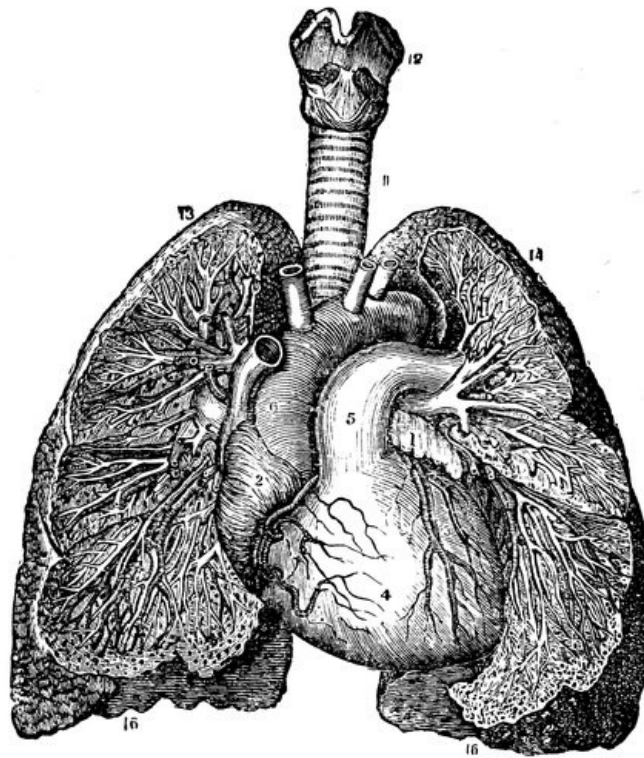
TIME FOR SLEEP.

Infants and old people need more sleep than boys and girls. Night is made for rest, and the day for work. Do not take naps through the day nor sit up late at night. Never lie down to sleep directly after a meal.

POSITION IN STANDING, ETC.

Children are apt to stand and sit in a wrong position. When walking, the head and shoulders should be thrown back, so as to give the lungs full play. Breathe slowly and deeply, filling every part of the lungs at each inspiration. When in the school-room or at home, be careful not to lean over by bending the body in the middle of the back.

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SHOWING POSITION OF LUNGS AND HEART.—(1) *Left Auricle*, (2) *Right Auricle*, (3) *Left Ventricle*, (4) *Right Ventricle*, (5) *Pulmonary Artery*, (6) *Great Aorta*, (12) *Larynx*, (13 to 16 and 14 to 16) *Lungs*.

I am afraid that a good many children will find, if they notice their posture when studying their lessons, that their spines are curved like a bow and their shoulders pushed forward so as to crowd the lungs and prevent deep, healthful breathing. The boys, perhaps, will find a large dent or wrinkle in their clothing in front at the pit of the stomach. This shows that their posture is wrong.

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WHERE TO BEND THE BODY.

If you wish to bend forward, the pivot is at the hips; the spine should not be bent at all. When a child is reminded that his posture is wrong, he is apt to straighten up with a jerk, throw his shoulders far back and thrust his chest forward like a pouter pigeon. This is almost as bad as the other extreme, for it is unnatural, and after a few minutes, they gradually return to their former stoop. The natural posture is easy and graceful and can be held longer than any other.

What should be your motto? What do children need? What do their bodies and brains require?

What position should be taken when lying in bed? What should be done with the limbs? What of bad dreams? How can you avoid the habit of snoring?

Who needs the most sleep? What is said of night and day? What of taking naps through the day? When should you avoid sleep?

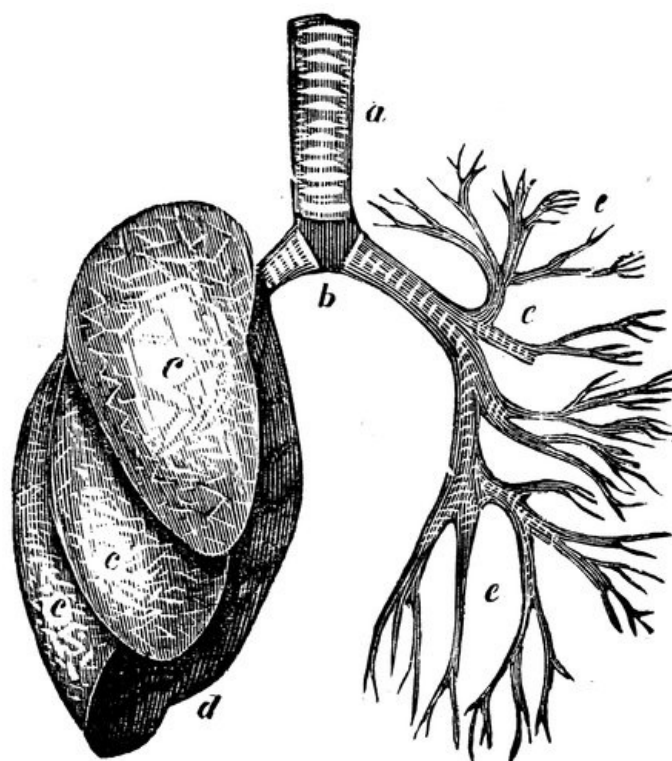
What of standing and sitting? What ought your posture to be when walking? What is the right way to breathe? What must be guarded against when in the school-room or at home?

What will a good many children find, if they notice their posture when studying their lessons? What will show a boy that his position is wrong?

What is the right way to bend forward? What of the spine? What is a child apt to do when shown that his position at the desk is wrong? What have you to say of this?

PURE AIR, CLOTHING, ETC.

There can be no good health without pure air. Always have it if possible. Before you lie down to sleep at night, make sure your windows are lowered at the top and slightly raised at the bottom, so that the room is well ventilated. If the bed has enough covering, you will sleep much better if the air is fresh and cool.



(a) *Trachea*, (b and e) *Bronchial Tubes*, (d) *Right Lung*,
(c) *Lobes of Lung*.

It is a good practice to spend a few minutes early in the morning, in drawing into the lungs all the air they can possibly hold. Then breathe out slowly, by keeping the lips almost closed. While doing so, rapidly thump the chest and ribs with the flat sides of your fists. This will expand your lungs and prevent the congestion or settling of blood among many of the organs, besides strengthening and toning up the system.

PROPER USE OF CLOTHING.

Your parents furnish you with warm, comfortable clothing, but much depends on you whether it shall help preserve your health. Children often catch cold and more serious diseases by carelessness about their dress. Be careful that all your garments sit well and are not loose enough to annoy you, nor tight enough to cause discomfort.

Boys should lay off their overcoats and overshoes, girls their wraps and overshoes when they enter a warm room. Always put them on before going out in the cold or wet. Neglect in following this rule has often caused pneumonia and death.

DAMP CLOTHING.

If the clothing, shoes or stockings become wet, they should be changed at the earliest moment. If there is no chance to make such change, keep in motion until the garments can be replaced by others. If the moisture has reached the skin, it should be rubbed with a rough towel until dry and warm.

DANGERS TO HEALTH.

Before summer sets in, children are often tempted to sit or lie on the damp earth. This is hurtful and never should be done, even in warm weather.

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When heated from exercise, boys love to throw aside their outer clothing, so as to "cool off." This is dangerous; better to feel uncomfortable for a little while until your body resumes its natural temperature.

COLD OR DRAFT.

Never sit in a cold room or a draft. It is sure to injure you and may cause death. If you feel chilly, warm yourself by vigorous exercise.

Always obey the promptings of nature. Failure to do so poisons the blood, causes serious disease, and frequently destroys life itself.

Show the necessity of pure air. What precaution should be taken before lying down to sleep? What of drafts? What are necessary to sleep well?

What is a good practice for each morning? What will this do?

What depends upon you? What results from carelessness in these respects? Of what ought you to be careful?

What use should be made of overcoats, wraps, and overshoes? What has resulted from neglect to follow this rule?

What is the proper course, when the clothing, shoes or stockings become wet?

What are children often tempted to do in the spring of the year? Is it a safe thing to do at any time?

What is said about "cooling off?"

What about sitting in a cold room or draft?

What other advice is given?

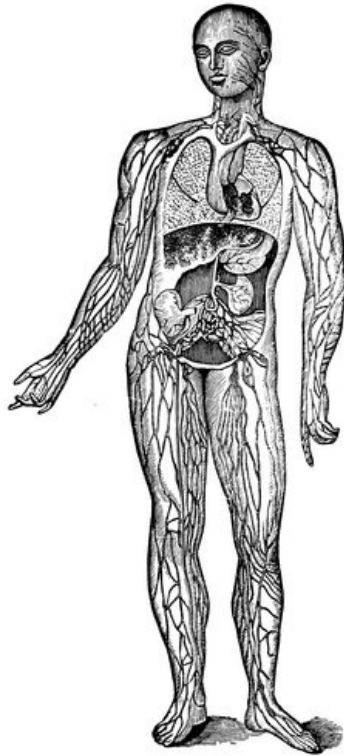
ACCIDENTS AND EMERGENCIES.

This little book is not intended to take the place of the physician, but is meant to help you to get along without him. We are all liable to accidents, and you should know what to do in such cases, before the doctor reaches you. Besides, you can often help yourself, and will not need the doctor.

HABITS TO CULTIVATE.

Cultivate regularity in all good habits. The hour for going to bed, and for rising, for eating your meals, for study, and for play, indeed, the time for every duty relating to your body, should, as nearly as possible, be just the same, day after day.

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ORGANS OF CIRCULATION.

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BLISTERS.

If a blister forms anywhere on the body, do not prick it. If you do, a sore will form. Leave it alone until it breaks of itself. By that time (generally in two or three days) a new skin will have formed, and the blister will pass away almost unnoticed.

BOILS, STINGS OF INSECTS, AND BURNS.

The skin of a boiled egg is a good remedy for boils. Peel it carefully, wet and apply to the part affected. The stings of insects may be covered with moistened earth. Slight burns will cause little pain, if the air is shut out by means of paste or anything of that nature.

BLEEDING OF THE NOSE.

For continued bleeding at the nose, apply ice or cold water to the back of the neck and push a plug of cotton, or soft rag covered with powdered alum up the nose. The "door-key" is good, because it is cold; any other piece of cold metal will do as well.

FIRE.

If your clothing should catch fire, keep your senses about you. Do not start on a run, unless the distance is very short to open water, into which you can plunge. An overcoat, blanket or piece of carpet, wrapped closely about the body, will smother the flames.

FAINING.

If a person faints he should be laid flat on his back, given fresh air, and water sprinkled in his face. The clothing about the neck should be thrown open, and people prevented from crowding around.

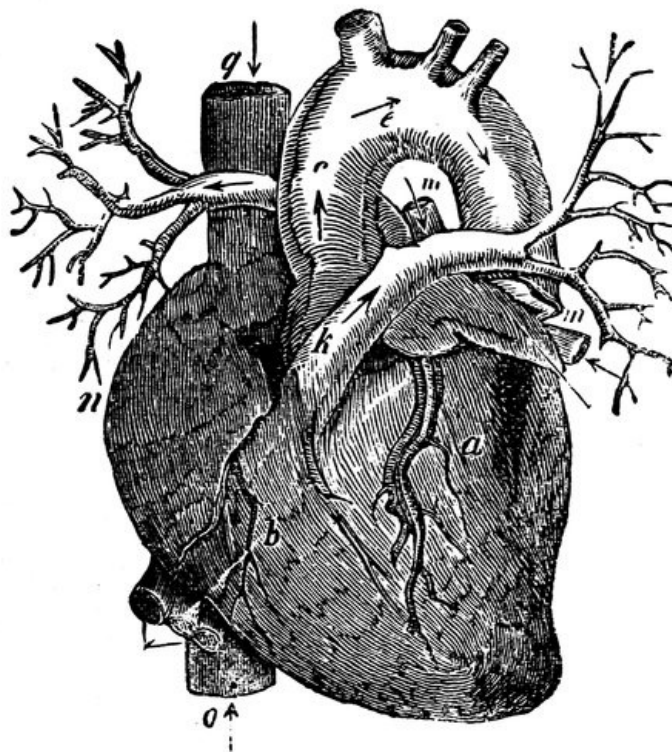
FROST-BITTEN FEET AND EARS.

Sometimes when a boy uses his skates too long, or he is exposed for a good while to bitterly cold weather, his feet or ears become frost-bitten. When this mishap takes place, he is apt to do the very thing he ought not to do.

He must not approach a fire, enter a warm room, nor use warm water or clothing. When any part of the body is frozen, snow should be constantly applied to it. If no snow is at hand, the coldest water that can be obtained must be used with cloths, until the frozen member is gradually thawed out.

SLIGHT CUTS AND WOUNDS.

All boys use jack-knives, and now and then inflict cuts upon themselves. As a rule, these do not amount to much, and only require to be washed with cold water and bound up with a clean rag; but, if a vein or artery is severed, there is great danger.



THE HEART.—(a) *The Left Ventricle*, (m) *the Left Auricle*, (b) *the Right Ventricle*, (n) *the Right Auricle*, (g, o) *Veins to Heart*, (k) *the Pulmonary Artery*, (c) *the Great Aorta*.

HOW TO TREAT A BLEEDING ARTERY.

If an artery is cut, the blood will be bright red, and will come out in jets, corresponding with the throbbing of the heart. As the arteries take the blood from the heart, the proper thing to do is to press the thumb strongly upon the artery just above the wound. Then a handkerchief should be knotted around the arm or leg, as the case may be, above the hurt; a stick placed under the bandage, and twisted about until the flow of blood is stopped. This will answer until the surgeon can be brought.

CUT VEINS AND BROKEN LIMBS.

The veins carry the blood back to the heart. If one is cut the blood is dark and flows steadily. It is managed more easily than an artery; all that need be done is to place some lint over the wound and bandage it firmly. This, of course, you will do as soon as possible.

If you should be so unfortunate as to break or dislocate a limb, assume an easy position and calmly await the coming of the surgeon. If a finger only is fractured you can walk to his office.

What is said of this little book? To what are we liable and what should we know?

What should be cultivated?

What is the rule concerning a blister which may form on any part of the body?

What is a good thing for boils? For the stings of insects? For slight burns?

What is the remedy for continued bleeding at the nose?

What is the proper course if your clothing should take fire?

What should be done with a person when he faints?

What is a boy apt to do when his ears or feet are frost-bitten?

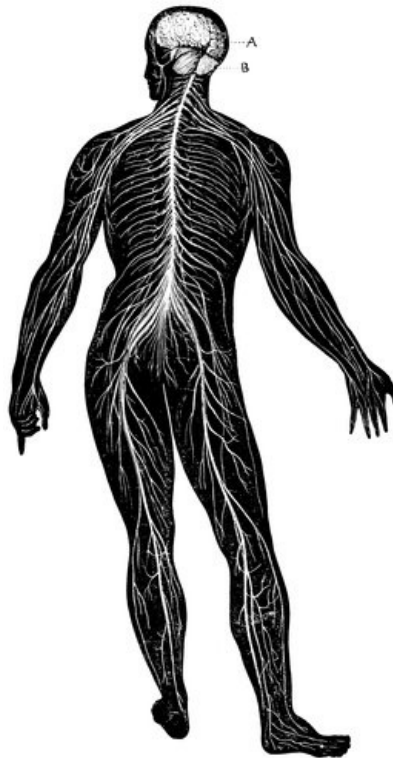
Give the proper course to be followed.

What should be done with a slight cut?

How can you know that an artery has been cut? What must be done?

What is the office of the veins? What need be done if one of them is wounded?

Suppose your arm or leg is broken, what is the proper course? If it is only a finger?



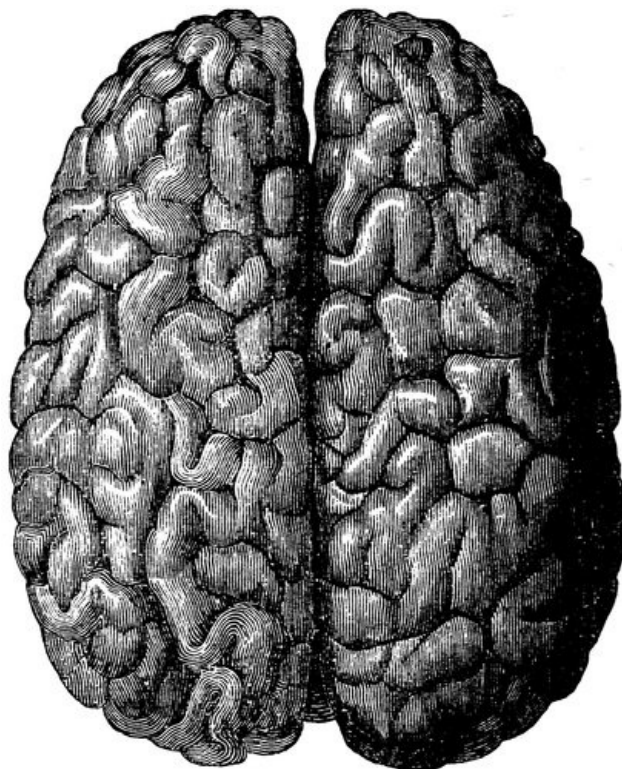
THE NERVOUS SYSTEM.

THE NERVES, BRAIN, SPINAL CORD, ETC.

The muscles which move the bones are themselves moved by the nerves. The nerves are soft and pulpy in youth, but harden as you advance in years. They are composed of a gray substance, called the nerve-cell, and a white substance, known as the nerve-fibre.

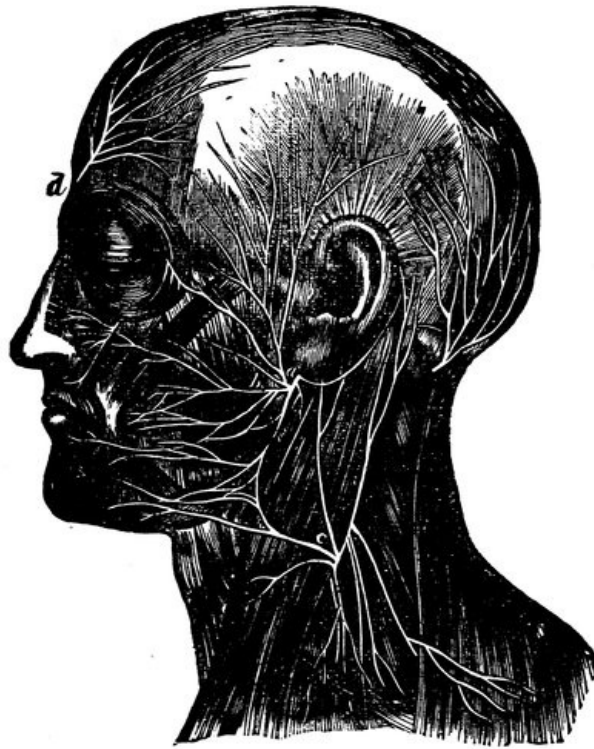
The brain is the mass of nervous tissue within the skull. It is so tender and easily harmed that nature has walled it about by a hard, bony structure to protect it from injury.

The gray substance of the nerves is where nervous impulses begin, which are conducted along the white substance. The gray matter may be compared to a telegraph office where the message is started, while the white matter is the wire along which the message travels.



SURFACE OF THE CEREBRUM.

The spinal cord, or marrow, is a mass of soft, nervous tissue, which fills the hollow running the length of the spine or backbone.



NERVES OF THE FACE AND NECK.—(a, b)
Nerve of the Face; (d) Nerve of the Forehead.

From the base of the brain twelve pairs of nerves are given off to the face and head. One pair passes to the eye, and gives sight; one passes to the nose, and gives smell; one, to the mouth, tongue, and palate, and gives taste; one, to the ears, and gives hearing; and others to the face, neck, and head, and give the expressions of joy, sorrow, pain, anger, and doubt.

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From the spinal cord thirty-one pairs of nerves pass to the various parts and organs of the body.

There could be no motion or feeling without the nerves, although they are not the true centres of either. If you obey the rules of health, as already laid down, you will be in the happy condition of those of whom it is said they do not feel that they have any nerves at all.

What move the muscles? How are the nerves in early youth? Of what are they composed? What are these parts called?

What is the brain? How is it protected?

Where do nervous impulses begin? To what may the gray and white matter be compared?

What is the spinal cord?

How many pairs of nerves are given off from the brain? From the spine? Where do they go?

What is said of sensation and feeling? What if you obey the laws of health?

SUNSTROKE AND POISONS.

Don't be afraid of the sun. Its rays give life and vigor not only to men and animals, but to the vegetable world. A little tanning or browning of the skin is good for you. In summer when the rays are very strong, you should avoid them; but at other times, live in the sunlight all you can.

Very rarely indeed is a child sunstruck; but it is wise to guard against it, because it is often fatal. As I have just told you, you must keep out of the direct rays of the sun when the day is very hot. It is well to carry a wet handkerchief, or several large green leaves in the crown of your hat.

SYMPTOMS OF SUNSTROKE.

The symptoms of sunstroke are stinging pains in the head, dizziness, weakness, confusion of sight, and in some cases, sickness at the stomach. The person becomes partly or wholly insensible and often moans or snores. Sometimes he has spasms.

HOW TO TREAT SUNSTROKE.

Should you ever see any one thus affected, do your utmost to have him taken at once to the coolest place that is near at hand, and where there is plenty of fresh air. The clothing should be removed and the body sponged with cold water, if the surface is warm; if it is cool, warm water should be used.

If the patient's body is very hot, his pulse high, he snores or moans, and is limp and senseless, he should be laid upon his face, his head slightly raised and cold water poured upon it for several minutes, from a height of four or five feet.

CAUTION.

If the pulse is feeble and fast, the breathing light, and the body cool, the treatment just named would be highly dangerous. The patient must be given small doses of diluted brandy or whiskey, and a blister applied to the back of the neck. Of course a physician will be sent for at once.

POISONS.

It may happen that a child swallows by mistake some kind of poison (when he is alone), and when a few minutes' delay in reaching a physician will be fatal. The best and indeed the only thing to do is to produce instant vomiting. Stir a tablespoonful of salt or a teaspoonful of mustard in a tumbler of warm water and swallow without a moment's delay.

At the end of five minutes, repeat the dose, and continue doing so for half an hour. If vomiting does not take place immediately, bring it on by thrusting the forefinger down the throat, since vomiting alone will save your life.

SULPHURIC ACID POISON.

There is but one poison which cannot be thrown off by the means just described. If water is drank directly after swallowing sulphuric acid, it will be fatal. Vomiting must be induced by using the finger.

A SAFE RULE.

The only safe rule for children, as well as for grown persons, is never to swallow or touch anything which they are not certain can do them no harm. When there is the least doubt, leave it alone.

What is said of sunlight? When should the rays be avoided?

What should be carried in the crown of the hat when the sunlight is very strong?

Describe the symptoms of sunstroke.

What is the first thing to do when a person suffers sunstroke? Suppose the surface of the body is warm? Suppose it is cool?

If the body is hot, pulse high, he snores, is limp, etc.?

If the pulse is feeble and fast, breathing light, body cool?

What course should be followed if poison is taken by mistake? Suppose the dose described does not cause vomiting?

What of sulphuric acid?

What is the only safe rule?

CIGARETTE SMOKING.

I have now a few words to say to the boys. I hope the girls will also listen, and help to impress the words on their friends.

Most of you have fathers, mothers, and perhaps brothers and sisters. You love them more than all the world. What would you think if I should tell you I can make you hate your mother, strike your father, lie, cheat, steal, do everything vile, and at last send you, disgraced and despised, to a wretched death?

You are shocked and cannot believe it; but, if you will walk the path I mark out, you will do just what I have said and reach the dreadful end—that is, if you live long enough.

SMOKING CREATES A MORBID THIRST.

The first step is cigarette smoking. It will give you catarrh, weaken the lungs, cause heart disease, destroy the health, and create a morbid thirst which will lead you to the second step,—the drinking of cider, beer, and malt liquors. Soon you will crave stronger fluids, and will swallow gin, wine, brandy, whiskey, rum, and all sorts of seductive drinks made from alcohol.

SMOKING DEGRADES THE TASTES.

By this time, you will be far along the road to ruin. You will begin to look upon your father and mother as slow, and will love the company of the wicked, and hate that of the good. Then will follow misery, woe, and eternal ruin.

BAD EFFECTS SHOWN IN TIME.

You know plenty of boys who smoke cigarettes, and you cannot see that they suffer any harm on that account. But, as in many other instances, the harm comes after a time; and often when too late to be cured. A great many boys die every year from cigarette smoking, and thousands upon thousands are stricken by disease from that cause alone.

QUALITY OF CIGARETTE TOBACCO.

In 1883, about three quarters of a billion of cigarettes were smoked in this country, of which more than one half were made in the city of New York. The tobacco used is the worst that can be found anywhere. Saltpetre is mixed with it to prevent moulding. Physicians will tell you that saltpetre, when thus taken into the system, is very hurtful.

The Havana cigarette is made of fair tobacco, but is rolled in thick, vile paper and soaked with creosote, which is very hurtful. But those cigarettes which pretend to be made of Cuban tobacco are imitations that are as bad as they can be.

CIGARETTE PAPER.

The oil of tobacco is highly poisonous; but the oil of the paper used for cigarette wrappers is worse than that. It burns white, because of the acids and chemicals in it.

HURTFUL TO THE YOUNG.

Smoking is specially harmful to the young. It weakens the stomach, causes indigestion, hastens the action of the heart, thus producing palpitation.

PRODUCES CATARRH.

Cigarette smoking is almost certain to produce catarrh, one of the most offensive and incurable diseases. This arises from the fact that the cigarette being much shorter than a cigar, the smoke is inhaled to a greater extent. You have seen boys swallow the smoke and puff it through the nostrils, thus inviting catarrh.

CAUSES ASTHMA.

Cigarette smoking tends also to cause asthma.

OTHER EVIL EFFECTS.

It renders the system more liable to attacks of pneumonia and bronchitis. It destroys a healthy appetite for solid food, and by the constant spitting it causes, excites a craving for drink. Many instances are known where the nerves of the eye have been destroyed by cigarette smoking. The following are the words of Dr. S. H. Keep, one of the leading physicians of Brooklyn:

“If one could select a fine, healthy boy of from twelve to fifteen years of age, well known for his fine physique, even disposition, and great strength, and start him in his career as a cigarette smoker under the observant eye of the public, what results might not accrue from such example as the panorama was unfolded to them?”

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“The decay of physical power, emaciation, the irritable temper, the sallow complexion, the drawn and anxious look, the unsteadiness of the hands, the dyspepsia, the capricious appetite, the aversion to parental and other advice, the tendency to seek lower companionship, could hardly fail to leave its impress upon such an audience.

“More especially in the nervous diathesis^[1] does this rapid decay make itself apparent, and in varying degrees according to the amount of indulgence. Physicians daily watch this process with pain and anxiety for those intrusted to their care. Indeed, if my own professional experience were to be my guide, I could declare the evil of cigarette smoking to be even greater than that of alcohol.”

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1. Di ath' e sis—A condition of the body which, predisposes it to a particular disease.

So alarming has become this evil that in some States, laws have been passed against cigarette smoking. But I trust that if any of you has felt like forming the vile habit, your own good sense will not allow you to do so.

What is the first step toward the ruin of the body and soul? What is the second step? What follows?

Where will you be by this time? What then will follow?

How is it that some boys do not seem to suffer from cigarette smoking? What takes place every year?

How many cigarettes were smoked in this country in 1883? Of what are they generally made? What of saltpetre?

What is said of the genuine Havana cigarette? Are there many genuine ones made?

What of the oil of tobacco? Of the oil of the paper?

How does smoking affect the young?

What loathsome disease is almost certain to result from cigarette smoking? Why?

What does cigarette smoking tend to produce? What other effect has it on the system? What is its effect on the appetite? How does it excite a craving for drink?

What is said by Dr. Keep, of Brooklyn?

What has been done by some of the States? What are your own views on the vice of cigarette smoking? Are you weak-minded enough to be persuaded ever to place a vile cigarette between your lips?

ALCOHOL.

Alcohol does not exist in nature. It is a fluid made by fermentation, or the rotting of vegetables and their juices. Beer, cider, and wine are produced by the decay of a sweet liquid taken from grain or fruits. Alcohol is that element in malt and spirituous liquors which produces intoxication.

ITS DANGER.

Alcohol is indigestible and lessens the muscular power. No person training for any severe contest would dare swallow a drop of it. Its great danger lies in its attractiveness. It makes one at first feel in high spirits, reckless of right and wrong, and it destroys his judgment and sense. You all know that an intoxicated person talks like an idiot.

EFFECT UPON THE ORGANS OF THE BODY.

Alcohol destroys the nerves, ruins the stomach, weakens the muscles, affects the heart, bloats the body, kills the liver, causes insanity, and makes men descend lower than the beast of the field. It turns wise men into fools; peaceable persons into brawlers; good citizens into wicked and dangerous ones; and is the direct cause of more than three fourths of all the crimes in the country.

COST OF ALCOHOL.

The total cost of alcoholic drinks each year is eight times that spent for education. The saloon-keepers outnumber the ministers of the gospel four to one. Sixty thousand people die annually from alcohol.

Those who use alcohol are very liable to disease. In Russia the cholera swept off one year every drinking person in a certain town before it affected a single temperate one. In New Orleans, five thousand drinking men died one season from yellow fever before it touched a sober one. In 1832, in Park Hospital, New York, out of 204 cases of cholera, only six were men of temperate habits; these all recovered, while 122 of the others died. 111

Sir John Ross, the famous Arctic explorer, never used alcohol or tobacco. On one of his voyages, when a youth, every one of the crew that was a drinker, died; but he himself was not sick a single hour. When exploring the frozen regions, he was an old man, the oldest of his crew being twenty years younger than he. His men used tobacco and spirits, but he went without either; and with his advanced years, stood the rigors and hardships better than any of them.

At a recent meeting of surgeons and officers of the Pennsylvania Railroad Company to arrange for medical and surgical supplies to be placed on trains and at each station on the road, the question of adding alcoholic stimulants to the supplies was at once rejected; some of the surgeons claiming that in case of shock from injury, it was worthless. 112

INTOXICATION.

Intoxication leads a person to do that which he would not do when sober if he dared. It therefore takes away the self-restraint that is the safeguard of society.

A GRAVE ERROR.

One of the greatest mistakes of the young is the belief that a person can drink a little beer, cider, wine or liquor now and then, without danger to himself. No one ever began drinking with the belief that he would die a drunkard; he meant to drink when he felt like it with his friends, but was sure he could stop when he chose.

TOTAL ABSTINENCE A SAFEGUARD.

Even if a person were able to keep to a moderate use of alcohol all his life, his brain and nervous system would become diseased. When epidemics visit any place, the first persons to die, as I have shown, are those accustomed to drink liquor.

EFFECT UPON THE MIND AND SOUL.

Poisonous as is alcohol to the body, it is more fatal to the mind and heart. It clouds the brain, dwarfs and blots out the good impulses, and increases the power of the passions and the baser side of our nature.

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The world is full of moral and mental wrecks caused by alcohol. You see them about you; the most wretched drunkard on which you ever looked was once a bright, hopeful boy like you. He could not have been made to believe he would ever fall so low.

Your only safety is to resolve never to touch alcohol in any form. Not only that, but it is your duty to do all you can to keep others from injuring themselves by its use.

Does alcohol exist in nature? What is alcohol? How are beer, cider, and wine produced? What element is alcohol?

What is said of alcohol? In what lies its great danger? What are its effects at first?

Show some of the evil effects of alcohol. Of what is it the direct cause?

Compare the cost of alcoholic drinks and the sums spent for education. How do the number of saloon-keepers compare with that of the ministers of the gospel? How many people does it kill annually?

To what are drinkers of alcohol liable? Illustrate this statement by what occurred in Russia. In New Orleans. In New York.

Prove the advantages of leaving tobacco and spirits alone by some facts respecting Sir John Ross.

What action was taken recently by the surgeons and officers of the Pennsylvania Railroad Company?

What does intoxication lead a person to do? What does it therefore take away?

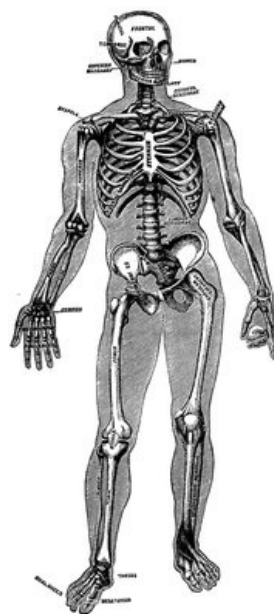
What is one of the greatest mistakes of the young?

Suppose a person really could restrain himself to a moderate use of alcohol?

How does alcohol affect the mind and heart?

What is said of the most wretched drunkard in the land?

What is the only safety? What is the duty of every one?

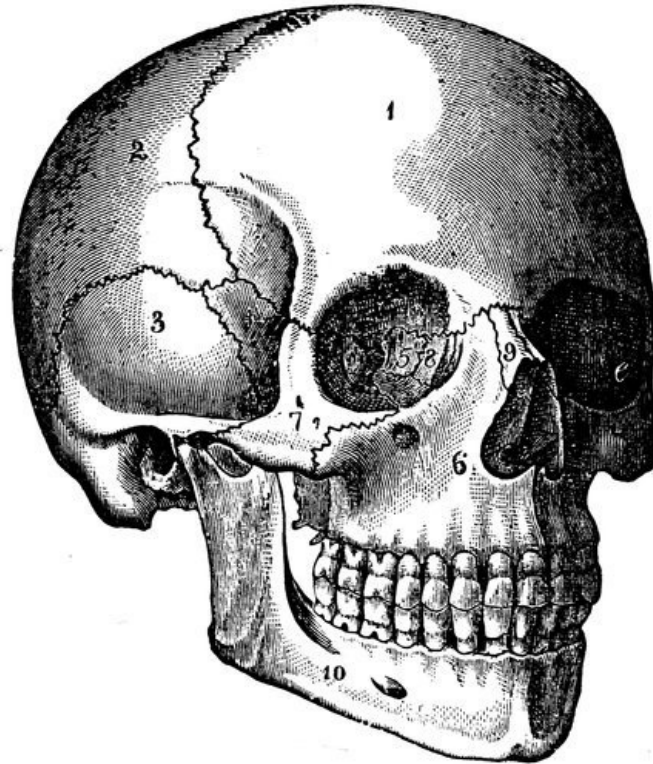


115

SKELETON.

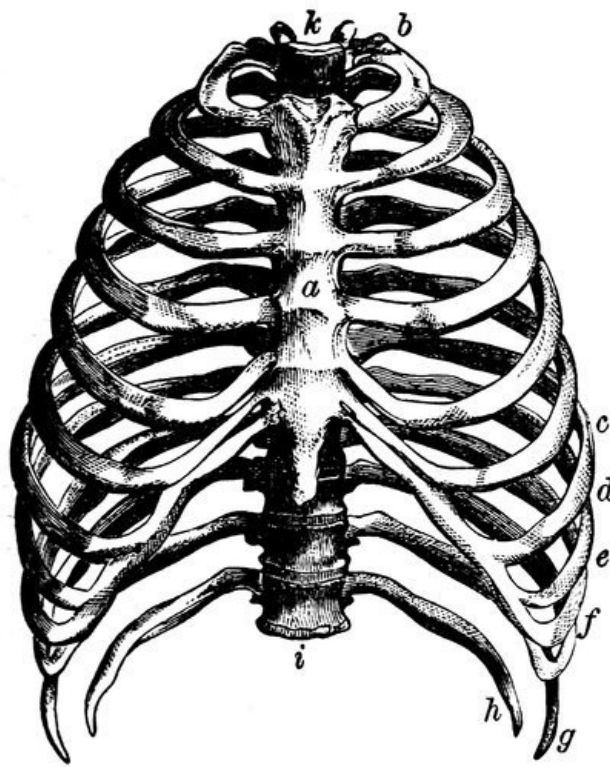
BONES, SKELETON, ETC.

The bones are the frame-work of the body. Like the muscles, they are generally found in pairs, one for each side of the body. Their number is more than two hundred. When joined together, in their proper position, they make a skeleton, as shown in the picture on page [115](#), where the names of the principal bones are given.

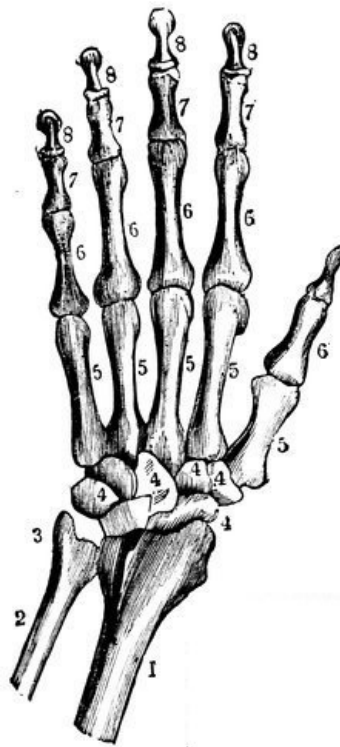


THE SKULL.—(1) *Frontal Bone*, (2) *Parietal Bone*, (3) *Temporal Bone*, (6) *Superior Maxillary (Upper Jaw) Bone*, (7) *Malar Bone*, (9) *Nasal Bone*, (10) *Inferior Maxillary (Lower Jaw) Bone*

A bone is composed of animal and mineral substance. The animal part gives it elasticity, and the mineral, hardness. In youth there is more of the animal substance, but it grows less as a person becomes older. This explains why the bones of a child do not break so readily as those of an aged person, and why, when broken, they heal much sooner. Sometimes when a very old man or woman has a limb broken, the bone will not “knit,” or heal at all.



THE CHEST.—(a) *The Sternum or Breastbone*, (b to c) *the True Ribs*, (d to f) *the False Ribs*, (g, h) *the Floating Ribs*, (i to k) *the Dorsal Vertebrae*.



THE HAND.—(1) *Radius*, (2) *Ulna*, (4-4) *Bones of the Wrist*, (5-5) *Bones of the Hand*, (6-6) *Bones of the Fingers*.

The movable joints are joined by bands or ligaments, which are very strong. They often refuse to yield, when the bone to which they are fastened is broken. If a ligament is strained or hurt, a "sprain" is caused, which may be as bad as a broken bone.

Boys and girls are apt to form bad habits by which some of the bones become misshapen. You should hold your head erect, but not thrust forward; keep the chest expanded and the shoulders well back. You will find, after awhile, that this healthful posture is the most pleasant you can take, and it will give you the form which nature intends all of us to have.

What are the bones? How are they generally placed? How many bones have you? What is a skeleton?

Of what is a bone composed? What does the animal part give? The mineral? Why is the bone of a child less liable to break than that of an older person? What takes place sometimes when the bone of an old person is broken?

How are the movable joints joined? What is said of the strength of a ligament? What is a "sprain"?

What are boys and girls apt to do? What is the proper posture? What will you find?

A CHEERFUL DISPOSITION.

Every boy and girl should cultivate a cheerful disposition. You will have grief and trouble, and must shed many a tear; but cheerfulness does more than anything else to lighten the burdens of life.

Have a kind word for every one. If there is a deformed boy or girl in school, never notice it by look or word. If a boy has a drunken father or any disgrace attaches to his family, always act as though you never heard of it. If he is poor and in need, make him such presents as you can afford. It will add much to your own happiness if now and then you give something which you think you cannot afford.

If some little girl wears odd-looking dresses, do not hurt her feelings by laughing at her. Show her kindness and make her feel at home when in your company.

Be respectful to old age. Elderly persons are sometimes fretful and say provoking things to children; but it is easy for you to keep back all impudent replies and to show that you feel no ill will toward them.

You should not only be obedient to your parents, but should feel pleasure in obeying them. No matter how you are employed, or what your own wishes are, show an eagerness to do whatever they may request. When father and mother leave you forever, you will be thankful beyond expression, if you can say you never caused them to shed a tear or feel any sorrow.

Be respectful and obedient to your teacher. Strive to obey all his rules in spirit and letter. Be attentive to what he says, and show by your conduct as well as by your words that you are grateful for his interest in and labors for you. It is you who will feel the most pleasure at all times, by striving to be cheerful. In truth, you will not have to strive long, for it will come natural to be cheerful.

Don't sulk and never repay evil for evil. If some one has done you an injury, the best way to "get even" is by an act of kindness; but be ready to protect the helpless against those who would oppress them. There are persons whose coming is like so much beautiful sunshine; there are others who are cross and disagreeable and whom no one likes. Strive, every day, to make some one happy, and live by the Golden Rule, "Do unto others as you would have others do to you."

What should every boy and girl cultivate? Why?

What about kind words? Suppose you have a deformed class-mate, or one to whom some disgrace attaches?

Suppose some little girl wears odd-looking clothes?

What of old age?

In what does true obedience to your parents consist? What will be the result of such obedience?

How should you treat your teacher? Who is most benefited by such a course of action?

What of sulking? What is the best manner of "getting even" with some one who has done you a wrong? What should you strive every day to do? What is the Golden Rule of life?

THE DIGESTIBILITY OF SOLID FOODS.

The following table is given in order to show the time required for the digestion of the most ordinary articles of food:

KIND OF FOOD.	MODE OF COOKING.	TIME REQUIRED FOR DIGESTION.	
		HOURS.	MINUTES.
Pork	roasted	5	15
Cartilage	boiled	4	15
Ducks	roasted	4	00
Fowls	roasted	4	00
Fowls	boiled	4	00
Beef	fried	4	00
Eggs	fried	3	30
Eggs	hard boiled	3	30
Cheese		3	30
Oysters	stewed	3	30
Mutton	roasted	3	15
Mutton	boiled	3	00
Beef	roasted	3	00
Beef	boiled	2	45
Chicken	fricasseed	2	45
Lamb	broiled	2	30
Pig (suckling)	roasted	2	30
Goose	roasted	2	30
Gelatin	boiled	2	30
Turkey	boiled	2	25
Eggs	roasted	2	15
Cod Fish (cured, dry)	boiled	2	00
Ox Liver	broiled	2	00
Venison Steak	broiled	1	30
Salmon Trout	boiled	1	30
Eggs (whipped)	raw	1	30
Tripe (soused)	boiled	1	00
Pig's Feet (soused)	boiled	1	00
Cabbage	boiled	4	00
Beetroot	boiled	3	45
Turnips	boiled	3	30
Potatoes	boiled	3	30
Wheaten Bread	baked	3	30
Carrot	boiled	3	15
Indian Corn Bread	baked	3	15
Indian Corn Cake	baked	3	00
Apple-dumpling	boiled	3	00
Potatoes	baked	2	33
Potatoes	roasted	2	30
Parsnips	boiled	2	30
Sponge Cake	baked	2	30
Beans	boiled	2	30
Apples (sour)	raw	2	00
Barley	boiled	2	00
Tapioca	boiled	2	00
Sago	boiled	1	45
Apples (sweet)	raw	1	30
Rice	boiled	1	00

TRANSCRIBER'S NOTE

1. Moved parenthetical questions from the bottom of each page to the end of the chapter.
2. Silently corrected typographical errors.
3. Retained anachronistic and non-standard spellings as printed.

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