

THE SCHOOL PAPER.

FOR GRADES VII. AND VIII. (1914).

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THE LIVING TEMPLE.

1. Not in the world of light alone,
Where God has built His
blazing throne,
Nor yet alone in earth below,
With belted seas
that come and go,
And endless isles of
sunlit green,
Is all thy Maker's
glory seen.
Look in upon
thy wondrous
frame—
Eternal wisdom
still the same.

2. The smooth, soft
air, with pulse-
like waves,
Flows murmuring
through its hid-
den caves,
Whose streams
of brightening
purple rush,
Fired with a new
and livelier blush,
While all their bur-
den of decay
The ebbing current
steals away,
And, red with nature's flame,
they start
From the warm fountains of
the heart.

3. No rest that throbbing slave
may ask,
Forever quivering o'er his
task,



From a painting by T. C. Gotch, entitled "My Crown and Sceptre," in the Sydney Art Gallery.]

CROWNED WITH HEALTH.

While, far and wide, a crimson
jet
Leaps forth to fill the woven
net,

Which, in unnumbered crossing
tides,
The flood of burning life
divides,
Then, kindling each decaying
part,
Creeps back to find the
throbbing heart.

4. But, warmed with that
unchanging flame,
Behold the outward moving
frame,
Its living marbles jointed strong
With glistening band and
silvery thong,
And linked to reason's guiding
reins
By myriad rings in trembling
chains,
Each graven with the threaded
zone
Which claims it as the Master's
own.

5. See how yon beam of seeming
white
Is braided out of seven-hued
light;
Yet, in those lucid globes, no
ray
By any chance shall break
astray.
Hark how the rolling surge of
sound,
Arches and spirals circling
round,

—OLIVER WENDELL HOLMES (1809-1894), a famous American poet, essayist,
novelist, and physician.

NOTES ON "THE LIVING TEMPLE."

1. The "world of light" is the sky, and the sun is referred to as "God's blazing throne." Truly, "the heavens declare the glory of God, and the firmament showeth His handiwork;" but not less plainly is His glory seen in the structure of our bodies.

Wakes the hushed spirit
through thine ear
With music it is heaven to
hear!

6. Then mark the cloven sphere
that holds
All thought in its mysterious
folds,
That feels sensation's faintest
thrill,
And flashes forth the sovereign
will!
Think on the stormy world
that dwells
Locked in its dim and clustering
cells;
The lightning gleams of power
it sheds
Along its slender, glassy
threads!

7. O Father! grant Thy love
divine
To make these mystic temples
Thine!
When wasting age and
wearying strife
Have sapped the leaning walls
of life.
When darkness gathers over all,
And the last tottering pillars
fall,
Take the poor dust Thy mercy
warms,
And mould it into heavenly
forms!

2. As we breathe, "the smooth, soft air, with pulse-like waves, flows murmuring through its hidden caves." The "hidden caves" are the air-cells in the lungs, each of them partially enclosed by a thin membrane in which is a network of tiny blood-vessels. The oxygen of the air we breathe in passes through the membrane into the blood, and is whirled away in the bloodstream, "kindling each decaying part" on its travels. At the same time that the oxygen passes inward through the thin membrane, carbonic acid gas and other impurities pass outward through the same membrane from the blood to the air-cells, and are breathed into the outer air through the windpipe and nostrils.

3. The purified blood, which has changed its color from dark crimson to bright scarlet, goes back first to the heart, which sends it all over the body. There is no rest for this "throbbing slave," which cannot cease its labor of expanding and contracting, and of opening and closing its valves for the incoming and outgoing streams.

4. The "living marble" of the bones is in itself a wonderful structure, a growing, changing tissue (especially in early life), traversed by minute blood-vessels. The bones are joined by "glistening bands" (elastic ligaments) and "silvery thongs," known as sinews. All these have communication with the brain by means of the nerves, delicate, transparent fibres, each a thin cylinder enclosing a cylinder of semi-fluid substance, within which again there is a core of semi-fluid matter.

5. The fifth stanza has to do with the eye and the ear. The eye, like the rest of the bodily organs, is built up from the blood. Through the "lucid globe" which forms its major part, light passes to paint on the retina, or curtain at the back of the eye, a picture of the outside world. Ordinary white light is made up of seven colors blended. Yet never by any chance do the seven rays go astray.

6. The ear, too, is built up from the blood. It is through the ear that we receive the delight of sweet sounds. By what machinery is this effected? Suppose that some one sings or plays. The air is set vibrating. The vibrations pass to the auditory canal, or earhole, and strike the membrane of the eardrum, which passes them on to a chain of little bones, arches, winding passages, tiny cords, fine bristles, and clear fluids with little, floating granules. The stimulus is transferred to the ends of the nerves of hearing, and, in some way that no one can explain, vibration is received by the brain as sensation.

7. The "cloven sphere that holds all thoughts in its mysterious folds" is the brain, the most wonderful of all the organs, a large sphere of soft grey and white matter lying in deep folds, enclosed in wrappings both fine and coarse, and divided vertically through the middle like the kernel of a walnut.

In these mysterious folds, thought is somehow developed. Here feeling resides. From here, the will sends forth its commands. Our passions, "the stormy world" of love and hate, joy and sorrow, all lie locked in

their own particular cells. Slender, glassy nerves, passing from the brain, carry the brain force, like "lightning gleams of power," along their threads.

8. This marvellous body of ours is a temple to be kept pure. The poet asks divine love to help us to do this. He thinks of the time when age and care will have worn out the body, when the pillars will fall, darkness will gather over it, and it will turn to dust. He implores that the dust of these temples may be moulded by the hand of the Creator into "heavenly forms."

PHYSICAL CULTURE.

1. If we go in for physical culture or anything else intelligently, we must have a good and sufficient reason for it, and it appears to me that the reason for practising not only swimming and rowing, but every form of physical exercise, is a threefold one. The nature of that which makes up a complete human being, man or woman, boy or girl, is threefold—body, mind, and spirit. Let us see how this bears on the subject.

2. Older methods of education were concerned chiefly with the second part of a child's nature, the mind. Not much was done in some countries to train the body. The main idea was to fill the pupil's mind with as much information in a given time as possible, to cram in knowledge just as food is crammed into Strassburg geese¹ to make their livers big. But the cramming did not make the children's brains big; it often had the opposite effect, for we must remember that, as food does not become nourishment until it is digested, so mental food—knowledge—cannot become wisdom or intelligence until it is digested.

3. The Greeks excelled all other ancient peoples in literature and art. Many believe that they did so because they paid more attention to bodily exercise; they brought gymnastics, the study of bodily positions and bodily exercise, to a high pitch of excellence.

4. The task of education is to help boys and girls to grow in the right direction; to enable them to become good workers and citizens; to lead them towards physical health and vigor, thoroughness and self-reliance, earnestness and cheerfulness in work, sympathy and helpfulness in social life, and reverence and good-will.

5. We know of the threefold nature of children, and try to develop each part evenly. These three parts—body, mind, and spirit—however, are so wonderfully connected and interwoven in that mysterious thing we call human life, that, in life, they can never be separated. Each is dependent on the others. Therefore, for a threefold reason, for the sake of the body itself, for the sake of the mind, for the sake of the spiritual nature, we feel that the body should be educated or developed along with the mental powers and moral qualities.

6. First, for the sake of the body itself. We know, of course, how the deep, full breathing of fresh air expands the lungs, purifies the blood,

and sends it in its swift, steady race to warm and nourish the whole body. We know, too, how proper and regular exercise strengthens and develops the muscles. But you may not understand just as clearly how much sickness may be warded off by keeping the body in first-rate condition. Scientists tell us about disease germs; but, I suppose, because they are not big enough for us to see them sitting round like the flies on our garbage tins, we do not pay enough heed. Still, they are there, not only in the rubbish heap, but in the air we breathe, the water we drink. There are whole colonies of them planted in our throats, our lungs, our stomachs, in imperfect teeth, even in our blood, waiting for a chance to grow and flourish, and to get the upper hand. And that chance comes whenever the vital tone of the body is lowered, when we are not taking in free draughts of fresh air to keep the lungs working well, when the blood becomes poor and flows languidly, when the stomach is obstructed and its juices act feebly. Then is the chance for bacilli² to flourish; and, when they get the mastery, down we go with influenza, typhoid, or some other disease.

7. Just here let me say something also which should appeal to every girl, and that is how much the body is beautified by physical culture, and the good health resulting from it. Besides giving a straight, free carriage, physical culture will help to brighten your eyes, to redden your lips. It will put a lustre on the hair, and produce a complexion such as rouge (*roozh*) and powder can never give.

8. We can easily see how physical culture helps in the second part of our nature, when we remember that the mind works through the medium of the most complex and delicate part of the physical body, the brain. That brain must be regularly nourished, and freely supplied with pure blood thoroughly oxygenated by full draughts of pure air, if it is to do the mind justice.



HYGIEIA.

Hygieia (*hy-jee-yaah*), goddess of health, was, according to Greek mythology, the daughter of Æsculapius, the god of the healing art. She is generally represented with a snake, the symbol of health, which drinks from a cup held in her hand.

9. If the brain is poorly or irregularly nourished, it may in time become clouded, morbid, or even unsound, and the foundations of that dread disease, insanity, be laid. Even now, there are scientists searching for the germ which they suppose may exist and produce insanity, an unknown germ, which may multiply and flourish in an unhealthy body, and become capable of breaking down the fine tissues of the brain, and destroying its powers.

10. Then the spirit, the highest part of our nature, that which speaks of divinity implanted in us, works through the mind by means of the brain. Whence come those fine instincts of love and of justice, those divine impulses of compassion and generosity, but from the God-nature within us? But, if our brains are not clear and healthy, we cannot become conscious of these delicate instincts and impulses; if our bodies are weak and sickly, we cannot carry them out in good actions.

11. What I would like now, in other words, to impress on you is, that, if we are to do any good in the world for ourselves or for anybody else, we must have sound physical health, and that sound health may be very largely promoted by proper exercise. That is why teachers pay great attention to this branch of your education.

12. In summer, physical culture may take the form of swimming. It is an ideal exercise, for, in addition to the personal pleasure and profit to be derived from it, it contains the elements of heroism. Byron, a great English poet, was an ardent swimmer, and you may know his eloquent lines:—

“And I have loved thee, ocean! and my joy
Of youthful sports was on thy breast to be
Borne, like thy bubbles, onward; from a boy,
I wantoned with thy breakers—they to me
Were a delight, and, if the freshening sea
Made them a terror, 'twas a pleasing fear;
For I was, as it were, a child of thee,
And trusted to thy billows far and near,
And laid my head upon thy mane—as I do here.”

Shakespeare, the greatest of poets, frequently mentions swimming, and you may read his fine description of a strong swimmer in the first act of his beautiful play, “The Tempest.”

13. Many lives have been saved by good swimmers. There is no need to recount the stories of such rescues; but it is pleasing to know that many who read this are adding to their proficiency in swimming a knowledge of rescue work and of restoring the apparently drowned. The art of restoration is most important, especially in remote places where other skilled help may not be at hand. How terrible must be the feeling of the helpless young mother, away in the bush, who rescues her child from some dam or tank into which it has fallen—not too late, perhaps, if

she has knowledge or skill to restore it!—but who does not, alas! know what to do; and, as she wrings her helpless hands in anguish above it, the little life goes out for ever!

14. In winter, many girls take up a course of gymnastics, and wear a pretty and suitable drill costume. I hope most earnestly that all girls will carry out the course vigorously, and get up a fine glow of health and generous enthusiasm. If they do so, they will be ever so much more sensible than the stupid boys who waste whole winter afternoons merely watching football, instead of getting away to some vacant field or sports ground and playing the game themselves. It makes one wonder whether, later on, they will be amongst those who are content to stand aside, idlers and failures, and watch others play the game of life.

15. I would only urge you to persevere in a whole-hearted way with any good program of physical culture laid down for you. You will certainly be rewarded by improved health and energy—for energy is almost entirely a matter of health—and by improved mental powers.

16. And, above all, learn to regard your bodies always as the temple wherein dwells an immortal soul. Do not allow that temple to become a crumbling ruin, but learn to build it up, an edifice sound and strong and sweet, a fit abode for the divinity within.

—Adapted from an article by S. C. in *The Commonwealth School Paper*, N.S.W.

1. **Strass-burg geese.** Strassburg, a city of Alsace-Lorraine, Germany, is world-famous for its patties, or little pies, made from the livers of geese. The geese, it is said, are kept alive in heated rooms to bring about an enlargement of the liver. A paste of the same nature is sold by grocers in Australia—*pâté de foie gras* (pronounced *pat-tay deh fweh grah*), patty of fat liver.

2. **Ba-cil-li** (the “c” as s, and the “i’s” as in *ill*), the Latin plural of *bacillus*; rod-like germs present in the blood and tissues of animals and in milk.

THE HYGIENE¹ OF BATHING.

1. Who has not felt better after a bath? How many who have experienced the betterment of feeling have paused to inquire its meaning? There are two reasons, and they are both connected with the functions of the skin. First of all, the skin is not merely a protective covering for the body. It is a great organ, charged with the duty of getting rid of a good deal of waste bodily tissue. The skin is studded with innumerable little vents, or pores, and through these issues the perspiration, which is secreted in the tiny sweat glands. Added to these are other tiny glands which manufacture an oily substance that keeps the skin soft and pliable.

2. The older cells of the skin are constantly being shed from the surface; so that it is easy to see that the pores of the skin may become blocked, if all this waste material is not removed. It is necessary, therefore, to keep the surface of the skin clean by means of baths. The first purpose of the bath, then, is cleanliness.

3. As a good deal of the waste matter of the skin is of oily consistence, it is usual to employ soap to soften it so that the water may more easily

effect its removal. For the same reason, cold water is less effectual than water which has been warmed, and, therefore, the warm or hot bath with the use of soap is best for cleanliness.

4. But there is another effect of bathing also depending on skin function. The skin is supplied with a very close network of the nerves of sensation or feeling. The effect of water on these nerve endings is to stimulate them and increase the blood-flow, not only in the skin itself, but in the internal organs. It is in this way we get the tonic or refreshing effect of bathing; and this is scarcely less important to good health than the cleansing function.

5. Sea-water is more bracing than fresh water, because the minute particles of salt irritate the nerves of the skin. It is usually supposed that cold water is more bracing than warm, but this is not true for all bathers; and, unless the cold water produces a bodily glow of warmth which lasts for some hours, it is better not to use it. Fairly vigorous health is necessary to enjoy a cold bath at all seasons of the year. Unless you feel distinctly refreshed after the bath, it is important to ask whether you are taking it at the right degree of warmth or not.

6. Baths, then, have two important ways of giving good health. First, the skin is kept clean and ready for action; and, secondly, the stimulation of the skin is one of the most refreshing of "tonics."

7. There are a few important "don'ts" to remember about bathing:—

- (i) *Don't bathe soon after a meal.* If you do, the nervous force is drawn away from the internal organs of the body, and digestion is stopped.
- (ii) *Don't bathe when you are very tired.* If the body is very exhausted, the additional call on its nerves only leaves them more exhausted.
- (iii) *Don't bathe in very cold water when you are overheated.* By driving the blood suddenly out of the skin, you produce a congestion of the internal surfaces which may be fatal. For the same reasons, it is often dangerous to paddle in cold water under a very hot sun.
- (iv) *Don't remain in the water after you feel chilled.*

8. If these simple precautions are kept in mind, you will get nothing but good from your daily bath, and every one ought to take a daily bath.

—DR. ALEXANDER LEWERS, Melbourne.

1. *Hygiene* (*high-zheen* or *high-zjee-eeen*), a system of principles or rules for the promotion of health; the science of the preservation of health.

HEALTH.

The common ingredients of health and long life are—

Great temperance, open air,
Easy labor, little care.

—SIR PHILIP SYDNEY (1554-86), English statesman and author

THE SCHAFER METHOD RHYMED.

- | | |
|--|---|
| <p>1. At once the doctor call,
But linger not at all;
Unfasten any clothing that
is tight;</p> | <p>The throat and nostrils clear;
Let some one who is near
Assist you with the patient
in his plight.</p> |
|--|---|



PREPARING TO RESTORE BREATHING.

- | | |
|---|--|
| <p>2. Now, quickly, on his face,
Your patient you must place;
Be careful that his cheek is
on the ground.
His arms above his head
Should both of them be spread,
And all the time fresh air be
blowing round.</p> <p>3. Next, breathing imitate
(There is no time to wait);
Astride your hapless patient
quickly kneel.</p> | <p>Now forward, slowly, swing;
Hands in position bring;
The lowest rib on each side
you should feel.</p> <p>4. Your fingers wide are spread;
Your thumbs point to his head;
Your palms lie flat upon your
patient's back.
If, near the patient's waist,
Your hands are rightly placed,
You're ready now to make a
bold attack.</p> |
|---|--|



PRESSURE APPLIED.

5. Now downward-forward press
For seconds two, not less ;
Release the pressure, back-
ward smartly go ;

Then forward, slowly, swing ;
Again the pressure bring ;
The movement is continued,
to and fro.



PRESSURE RELEASED.

6. Both movements to restore
Are done in seconds four ;
Let nothing with the effort
interfere.
The patient, "coming round,"
Will make a gurgling sound,
Or else his breathing you can
see and hear.
7. The blood within his veins
Lags feebly, so take pains
To make a brisker circulation
start.

With pressure firm and warm,
Rub all the patient's form ;
Remember always rub
towards the heart.

8. Your patient, when improved,
Is carefully removed
To bed, where means to warm
him are applied.
Hot bottles, blankets, bricks,
Round limbs and body fix ;
And think ! Without your
help he might have died.

-- LUCY READER, Yarraville School.

NOTE.—The pictures are of girls of the Mordialloc School, Victoria.

TOWN PLANNING.

1. In all the great countries of the world, statesmen are thinking about the effect of city life on the health and the welfare of the people. It was not so always, because it is only within the last century that great cities have come into existence. It is probable that Rome at its greatest did not contain more than a million people. Sydney to-day contains over 650,000 people ; London has fully ten times that population ; the population of New York is about three millions and a half ; and Chicago and Philadelphia contain between two and three millions of people. Paris and Berlin, again, are larger than Chicago. It is found, as a matter of experience, that, in these great cities, people are apt to

crowd their dwellings close together, to erect houses into which the sunlight cannot enter, and to live in places which are far removed from such open spaces as parks or playgrounds.

2. It is noticed that people who spend their working day in a shop or a factory, and walk or are conveyed home through city streets to an unsuitable dwelling, are apt to show signs of impaired health ; and the children who are brought up in such cities have neither the same chance of living nor of becoming vigorous as those who are brought up in open and healthy spaces. The city is, however, a necessity. It is the outcome of the factory system, and the factory is the basis of much of the wealth and comfort of the bulk of the people in the world

3. The problem which faces those who govern nations is, by what means can they retain the advantages of the factory system, and get rid of its disadvantages. The method which has been adopted in Great Britain, Germany, and America, is known as the "garden city" or town-planning movement, supplemented in the United States by what is known as the "public playground" movement.

4. A garden city or suburb is a collection of houses and factories which are intended to be healthy, to be useful, and to be beautiful ; and which are placed in such a manner that those who live in them are close to public buildings and open spaces. The garden city of Letchworth, for example, is surrounded by agricultural land. The city contains 8,000 people, and will some day contain 30,000 people. But, as it grows, it will not be possible to cut up this agricultural land into allotments and build houses upon it. It is regarded as part of the city, and must remain as agricultural land alongside the city for all time.

5. At one time, Melbourne was like Letchworth in this respect ; but, as it has grown, the agricultural land has been pushed farther and farther away, until it is practically non-existent so far as those who live in the city are concerned. Had Melbourne been developed on garden-city lines, as soon as the city became full, another city would have been built on the other side of the agricultural belt, and we should have had Melbourne consisting of a series of factories, dwellings, and public buildings, separated by strips of agricultural land on which dairy products would have been produced.

6. Now, of every 1,000 babies born in Victoria, 67 die during the first year of life, and, of these, probably one-third could be saved. They are killed by drinking milk which is stale, decomposing, and usually infected by flies. The milk drunk in Melbourne has to be conveyed many miles before it can reach those who require it. The milk in a garden city has to be conveyed only a few hundred yards. For this and other reasons, the death rate in Letchworth is remarkably low. It is not 5 per cent., as against 20 per cent. for Liverpool, and 25 per cent. for parts of London.

7. In the United States of America, great efforts have been made to secure a large number of open spaces throughout the cities. These

are not parks, of which there is also an abundance, but spaces varying in size from half an acre to three or four acres. These are called public playgrounds, or public recreation centers, and they consist of an outdoor portion and an indoor portion. The outdoor portion is usually divided into four sections—one for children under the age of ten, one for boys over ten, one for girls over ten, and a place where men can play.

8. Each of these divisions is placed in charge of a superintendent. The indoor portion contains swimming baths for men and women, game-rooms, reading-rooms, and a dance-room, in which balls and concerts can be given. All these can be enjoyed by any citizen who behaves himself or herself. As a result of much experience, America has learned that it is better to have a large number of small playgrounds than a few large ones. The playgrounds are owned by the municipalities, and administered by them.

9. Therefore, the modern garden city would consist of healthy, useful, and beautiful houses, placed in the manner described above, and provided with public recreation centers, to which any citizen could have access. Some people may say we have parks in Melbourne, and we have beaches. It is quite true. In the older parts of Melbourne, there are extensive and beautiful parks. But the newer suburbs which have sprung up, such as Camberwell, and some of the older suburbs, such as Collingwood and Fitzroy, have very few parks. Public recreation centers are no use if situated a long way from the residences of the people; and parks never take the place of playgrounds for that reason.

10. The playgrounds in the United States are open after school hours, and are thronged with happy and interested children, and, during portions of the day, by many grown-up children as well.

A moment's thought will show you how much fuller and healthier life may be in a garden city provided with playgrounds than in a crowded suburb like some of those in our own city, where there are no parks, or playgrounds, or baths—at all events sufficiently near to be of use.

11. If we agree that it is desirable to rearrange our cities, and make them more beautiful, more useful, and more healthy, how can we set about it? As Melbourne continues to extend, new houses are usually erected on allotments which are a result of cutting up a paddock. Roads, large and small, are made through the paddock, frontages to the road are sold, and, almost at once, the paddock has gone, and has left in its place allotments on which there are houses and fences. No open spaces have been preserved, no public playgrounds have been provided, and no public baths are thought of.

12. And so it comes about that, later on, municipalities find it necessary to buy back small pieces of ground at high prices for public purposes. In Germany and in England, people are no longer allowed to cut up ground in this way. They are shown that it can be cut up in ways that are

nearly, if not quite, as advantageous to themselves, and much more advantageous to the people who are to live in the city.

13. In 1909, the British Imperial Parliament passed an Act, usually referred to as the *Town Planning Act*, which gives the municipalities and the Government power to control the development of the city, and to help those who try to provide these necessary adjuncts.

14. It should be our aim in Australia to obtain similar legislation, and, in such a favored land and climate, to prevent the development of evils which the older countries are trying to eradicate.

—DR. JAMES W. BARRETT, C.M.G., Melbourne.

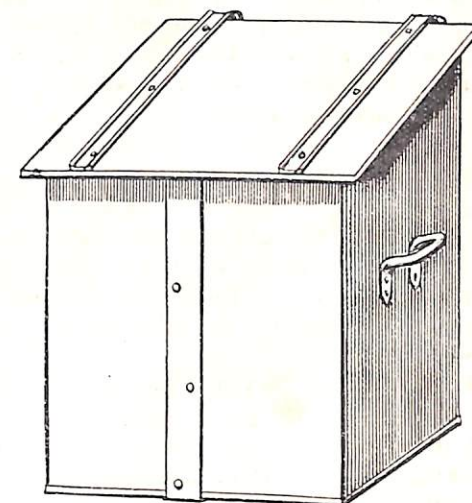
CIVIC HYGIENE.

1. Civic hygiene, or the promotion of health in cities, is a development of recent years, and is a subject that is growing in importance daily. It has come into existence largely as the outcome of the growth of medical knowledge. Before the exact causes of diseases were known, the proper steps necessary to minimize or prevent them could not be taken. Much of the work in connexion with civic hygiene concerns the councils of the various districts.

2. When individuals live in remote places, far removed from other people, the manner in which they live or conduct themselves does not, as a rule, affect anyone else. But, when people come to reside close together in towns and cities, the manner in which they live and how they conduct themselves concerns others very closely.

3. Take, for instance, the dirty and dangerous habit of spitting. For a number of years, we have known that people suffering from certain infectious diseases have the germs of the disease in their spittle. If these people spit about in their homes or places of employment, in the streets or public places, they are liable to be a source of serious danger to others. However, if people suffering from these diseases are very careful in the disposal of their spit, they will cause little or no risk to others.

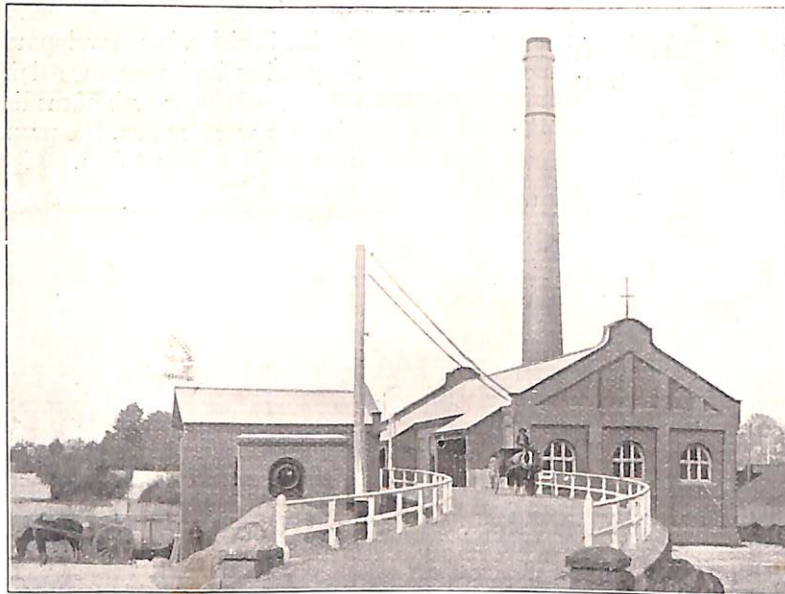
4. Many people, even grown-up people who should know better, are very neglectful of the safety of others, and are very careless in the



A GOOD STYLE OF REFUSE BIN.

matter of spitting about. On this account, Government departments, councils, and other authorities have been given powers by law to prevent and put a stop to the practice. Everywhere one goes, one nowadays sees notices forbidding people to spit; but it is surprising to find that it is necessary, from time to time, to summon people to court and have them fined for breaches of the by-laws against spitting on footpaths and other places.

5. Another matter closely concerning the healthiness of cities is the cleanliness and state of the dwellings in which the inhabitants live. Councils are given power under the public health laws to make inspections of dwellings in order to see that they are of sanitary, or healthy, construction, in other words, to find out if rooms are



REFUSE DESTRUCTOR, PRAHRAN, MELBOURNE.

It contains furnaces for burning and rendering innocuous household and trade refuse, and reducing most of it to clinker, a substance suitable for mixing with tar for tar pavements and with cement for concrete.

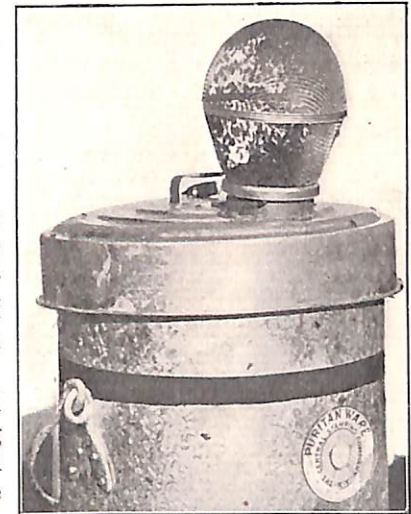
adequately ventilated and lighted, clean and in proper repair, and free from dampness. Where premises are found to be insanitary, improvements can be enforced so as to bring them into a satisfactory state.

6. City people who do not keep their houses and yards clean are often a source of trouble to their neighbors. Where they are careless about house refuse, not keeping it in metal receptacles with close-fitting covers, there is opportunity for flies to breed, and encouragement for rats.

7. Councils can by law compel householders to have proper garbage tins and to keep their premises clean. It is even necessary to summon people for neglect in these matters. Everyone knows that flies and rats are a great nuisance, and active measures should be taken to kill them. Rats spread the disease known as bubonic plague; while flies can carry the germs of diseases such as typhoid fever, tuberculosis, and cholera.

8. Another practice which careless people have is that of throwing waste paper, fruit skins, and similar matter on footpaths, instead of putting such material into the rubbish baskets provided in the streets.

9. It is the knowledge of and attention to matters like the foregoing that tend to the cleanliness and healthiness of cities, and to the welfare of their inhabitants.



From *The House Fly*, by L. O. Howard (John Murray.)

AMERICAN REFUSE BIN WITH FLY-TRAP ATTACHMENT.

—DR. T. W. SINCLAIR, Officer of Health, Melbourne.

THE ORIGIN OF VACCINATION.

1. In the little market town of Berkeley (*bark'-lee*), situated in the west of Gloucestershire, England, there practised in the last quarter of the 18th century an obscure physician named Edward Jenner. (Berkeley Castle is familiar to all readers of English history as the place where King Edward II. was murdered in 1327.)

2. During the 18th century and previously, small-pox was a very common disease, in fact, as common as measles is now. Scarred and pitted faces were the rule rather than the exception.

Physicians had found by experience that, if healthy persons were inoculated with mild small-pox, the results, as a general rule, were not very serious. Consequently, the people, in order to avoid the dangerous form of the disease, eagerly demanded to be inoculated. In some cases, however, inoculated small-pox had fatal results, and it was always a means of spreading the disease in the natural way.

3. Dr. Jenner, in the course of his practice, noticed that persons who had suffered from cow-pox appeared to be immune to small-pox. He formed the theory that an attack of cow-pox protected against small-pox. He determined to test his theory, and he did so in the following manner.

4. In April, 1795, he had an opportunity of inoculating Joseph Merret and his family with small-pox. Merret had had cow-pox in 1770, twenty-five years previously. All the family except Merret acquired small-pox. Notwithstanding the fact that Merret was repeatedly inoculated with small-pox, and that he was exposed to contagion in the house, he remained free from disease. Numerous experiments were carried out in similar



From *Disciples of Aesculapius*, by Sir Benjamin Richardson (Hutchinson and Co.)

DR. EDWARD JENNER (1749-1823), DISCOVERER OF VACCINATION.

On the 28th of March, virus was taken from William Summers and inoculated into the arm of William Read, aged eight years. This is the first case of arm-to-arm vaccination on record. William Read, shortly after, was inoculated with small-pox, but no disease appeared. Arm-to-arm vaccination now became common, and its efficacy was frequently tested by inoculation with small-pox, and the results demonstrated the truth of Dr. Jenner's theory.

From England, the practice of vaccination spread throughout the civilized world, and small-pox was conquered.

7. Dr. Jenner is, from time to time, reviled, insulted, and held up to ridicule as a charlatan; yet, for all that, the scientific world honors and reveres him, and has accorded him a high place amongst the immortals. His character may be judged by an extract from his "Inquiry":—

"Truth in this inquiry has ever been the object of my pursuit; and, should it appear in the present instance that I have been led into error, fond as I may appear of the offspring of my labors, I had rather see it perish at once than exist and do a public injury."

—DR. E. ROBERTSON, Chairman of the Board of Public Health, Victoria.

circumstances, and always with negative results.

5. The next stage in testing the theory was to induce cow-pox in a person, and then to try the effect of inoculation with small-pox.

Accordingly, in May, 1795, Dr. Jenner inoculated a healthy boy eight years old with the virus of cow-pox taken from the hand of Sarah Nelmes, a dairymaid.

On the first of July following, the boy was inoculated with small-pox, but no disease appeared. Some months afterwards, he was again inoculated with small-pox, but no ill results followed.

6. On the 16th of March, 1798, William Summers, aged 5½ years, was inoculated with cow-pox taken direct from a cow.

MILK.

1. There are very few boys and girls who would not say that they knew a great deal about cow's milk. They know that it is a very useful food for all, and especially for children. But I suppose not many have ever thought much about the cleanliness of milk, and whether it is free from the presence of the germs of disease.

2. All have seen cows milked, and it is easy to understand how objectionable matter can get into the milk in the pail, if cows are not clean and the udders and teats are not washed before milking. Then, too, the milker should have clean hands and wear clean clothes or overalls.

3. Milk is such a nutritious food that germs grow in it abundantly. In milk, there are numerous germs which are harmless and even useful. Sometimes milk contains germs of diseases which are dangerous.

4. To obtain a pure, wholesome milk supply, it is necessary that the cows from which it is to be obtained be healthy and free from disease; that milking and other operations be carried out in a clean manner; that dairy premises be well constructed, kept in a clean state, and provided with a pure water supply.

5. All persons working in connexion with milk should be healthy and free from infection. The danger from persons engaged in the business of the production and sale of milk, and suffering, at the same time, from an infectious disease, is a serious one, chiefly for the reason that they may communicate the infection to the milk, and thereby infect quite a large number of consumers.

6. People who work on dairy farms are liable, like other persons, to become ill, and should be extremely careful to ascertain as early as possible that any illness from which they suffer is not of an infectious nature. Epidemics of diphtheria, scarlet fever, and typhoid fever have been traced to the consumption of milk which had been infected by some person handling it, who was at the time suffering from the particular disease in a mild or unrecognized form. It is known also that milk may contain the germs of tuberculosis, when cows from which it is obtained suffer from that disease.

7. Special laws, such as the *Milk and Dairy Supervision Act* and the *Pure Food Act*, have been passed to control the production and sale of milk. The object of these laws is to secure a wholesome and pure supply, free from infection and adulteration. There are good grounds for believing that the present milk supply is much improved as compared with that of



A HYGIENIC COVER FOR THE MILK-JUG.

former years. Some persons are careless in their homes in the way they allow milk to be exposed to flies and dust, which may convey infection.

8. In outbreaks of infectious disease ascribed to infected milk, it is found that those persons who regularly scald milk before consuming it invariably escape infection. By raising milk to the boiling point, any disease germs contained in it are destroyed. A leading English physician writes "that he looks forward to the day when the drinking of raw (unboiled) milk will be considered as barbarous a custom as the eating of raw meat is at present."

9. The milk supplied to babies requires to be very pure and as fresh as possible. It should be kept under specially clean conditions, so as to preserve it from contamination of all kinds.

—DR. T. W. SINCLAIR, Officer of Health, Melbourne.

WHAT SCIENCE HAS FOUND OUT ABOUT ALCOHOL.

1. Alcohol was once thought to be a powerful supporter of animal heat. When taken into the human system, it was supposed to unite rapidly with the oxygen¹ received through the lungs, and thus evolve heat, leaving as products carbonic acid gas² and water.

2. It was not long, however, before Dr. Prout, of London, ascertained by experiment that the presence of alcohol in the system *diminished* the amount of carbonic acid gas exhaled from the lungs, and, therefore, there could be no combustion by which the alcohol was converted into carbonic acid and water. It was also found, by examination, that alcohol, received in the stomach in a dilute form, was taken up without change in its composition, and carried, with the blood, into all the organs and structures of the body.

3. Later on, Dr. Boker, a German, proved that the presence of alcohol in the living system reduced the quantity of matter discharged from the system as being of no further use to the body. He concluded, therefore, that its presence must retard those changes by which nutrition, secretion, and elimination are effected.

4. The writer made a number of experiments to find out the effects of the different articles of food and drink on the temperature of the body, and on the amount of carbonic acid gas thrown off from the lungs. These proved, beyond doubt, that, during the active period of digestion, after taking any *ordinary* food, the temperature is always increased; but, after taking alcohol, the temperature begins to fall within half an hour, and continues to decrease for from two to three hours. The fall in temperature and the time it lasts are proportional to the amount of alcohol taken.

5. These experiments prove that alcohol is in no sense food. It neither furnishes material for the tissues, nor fuel for combustion, nor yet produces either nervous or muscular force. Now, let us ask what are the positive effects of alcohol when it is taken in the ordinary manner.

6. Like chloroform, its presence diminishes the sensibility of the nervous system and brain, thereby rendering the person who takes it less conscious of outward impressions. This decrease in sensibility may be seen in all stages. An early stage is seen in the case of the man who feels less tired after taking a small quantity of alcohol. A late stage is seen in the case of the drunken man who lies unconscious in the gutter, and whom the policeman cannot rouse even by a rough shaking. In both these stages, there is a loss of sensibility—the difference being one merely of degree.

7. Alcohol does not relieve a person from cold by increasing his temperature, nor from heat by cooling him, nor from weakness by nourishing his tissues, nor yet from affliction by increasing his nerve-power, but simply by diminishing the sensibility of his nerve structure, and thereby lessening his powers of feeling either heat, cold, weariness, or pain.

8. It is this property of alcohol to produce that sense of ease arising from a lowering of nerve sensibility which gives it the great power it has wielded over the human race for centuries. But, while this easy feeling is present, the alcohol is, by its presence, hindering nutrition, secretion, and other actions necessary in the living body. When it is taken in small quantities repeated daily, the individual usually increases slowly in weight, not from increased nutrition, but from retaining the old atoms in the tissue. With this increase in bulk, there is a decrease in activity, power of endurance, and ability to resist disease.

9. This *moderate and continued* use of alcohol favors the formation of tubercular and fatty deposits in the lungs, liver, kidneys, heart, and arteries of the brain, and assists in materially shortening the length of life.

10. Let us now try to understand why all this happens. Between some particles of different kinds of matter, there is a great attraction, that is, there is a great tendency for them to unite. Such an attraction is there between alcohol and water, and alcohol and albumen. Hence, when alcohol is present in the blood, it attracts the water from the blood corpuscles,³ causing them to become more or less wrinkled, and inclined to stick to one another, and decreasing the power of the blood to take in oxygen from the air in the lungs; and, by its attraction for albumen, it prevents the attraction that should take place between that substance and other materials.

11. Alcohol, therefore, cannot be used without injurious effects proportional to the amount taken. Its necessary use as a remedy for disease is very limited, so much so that it might be wholly dispensed with.

—Abridged from a paper by DR. N. S. DAVIS, England.

1. **Ox-y-gen**, a colorless, tasteless, odorless gas, forming about 21 per cent. of the atmosphere.

2. **Car-bon^{ic} acid gas**, a colorless, heavy gas, extinguishing flame, and, when breathed, destroying life.

3. **Cor-pus-cles**, very small cells that are found in the blood. They are of two colors, red and white. The former are by much the more numerous, and are shaped like crumpets. It would take more than 3,000 of them, placed side by side, to extend an inch. The white corpuscles are slightly larger.

THE HAUNTED PALACE.

[In this wonderful poem, the author pictures, under the guise of a king in his palace, a sound mind dwelling in a sound body. Time passes, and, maybe through intemperance, the will-power of the ruler is lost, and the palace becomes a dreadful ruin.

Compare Andrew Lang's lines on Prince Charlie:—"Cruel and angry face, hateful and heavy with wine, where are the gladness, the grace, the beauty, the mirth that were thine? Ah, my prince, it were well—hadst thou to the gods been dear—to have fallen where Keppoch fell, with the war-pipe loud in thine ear!"]

1. In the greenest of our valleys,
By good angels tenanted,
Once a fair and stately palace,
Radiant palace, reared its
head.
In the monarch Thought's
dominion,
It stood there.
Never seraph spread a pinion
Over fabric half so fair.
2. Banners yellow, glorious, golden,
On its roof did float and flow;
(This—all this—was in the olden
Time long ago).
And every gentle air that
dallied,
In that sweet day,
Along the ramparts plumed
and pallid,
A wingèd odor went away.
3. Wanderers in that happy
valley
Through two luminous win-
dows saw
Spirits moving musically,
To the lute's well-tuned law,
Round about a throne, where
sitting
(Porphyrogene!),¹
In state his glory well befitting,
The ruler of the realm was
seen.
4. And all with pearl and ruby
glowing
Was the fair palace door,

—EDGAR ALLAN POE (1808-1849), a gifted American poet and story-writer.

1. Por-*phyr*-o-gene' (*jeen*), literally, "born in the purple"; hence of royal descent. Purple in ancient times was the imperial color.

- Through which came flowing,
flowing, flowing,
And sparkling evermore,
A troop of echoes, whose sweet
duty
Was but to sing,
In voices of surpassing beauty,
The wit and wisdom of their
king.
5. But evil things in robes of
sorrow
Assailed the monarch's high
estate
(Ah! let us mourn, for never
morrow
Shall dawn upon him
desolate!);
And, round about his home, the
glory
That blushed and bloomed
Is but a dim-remembered story
Of the old time entombed.
 6. And travellers now within that
valley
Through the red-litten
windows see
Vast forms that move
fantastically
To a discordant melody;
While, like a rapid, ghastly river,
Through the pale door
A hideous throng rush out
forever,
And laugh—but smile no
more.

LIFE IN THE OPEN.

1. The native boys of the Zulu and Swazi tribes in South Africa learn to be scouts before they are allowed to be considered men, and they do it in the following way. When a boy is about fifteen or sixteen, he is taken by the men of his village, stripped of all clothes, and painted with white from head to foot, and he is given a shield and one assagai (*as'-sa-gy'*), or small spear. He is turned out of the village, and told that he will be killed if any one catches him while he is still painted white.

2. So the boy has to go off into the jungle and the mountains, and hide himself from other men until the white paint wears off; and this generally takes about a month. All this time, he has to look after himself and stalk game with his one assagai, and kill it and cut it up; he has to light his fire by means of rubbing sticks together in order to cook his meat; he has to make the skin of the animal into a covering for himself; and he has to know what kind of wild roots, berries, and leaves are good for food.

3. If he is not able to do these things, he dies of starvation, or is killed by wild animals. If he succeeds in keeping himself alive, and is able to find his way back to his village, he returns when the white paint has worn off, and is then received with great rejoicing by his friends and relations, and is allowed to become a soldier of the tribe, since he has shown that he is able to look after himself.

4. In South America, the boys of the Yaghan tribe—down in the cold, rainy regions of Patagonia—wear no clothes; and, before they are allowed to consider themselves men, they have to undergo a test of pluck, which consists in the boy's driving a spear deep into his thigh and smiling all the time in spite of the pain.

5. It is a cruel test, but it shows that these savages understand how necessary it is that boys should be trained to manliness, and not allowed to drift into being poor-spirited wasters who can only look on at men's work.

6. The ancient British boys used to have the same kind of training before they were allowed to be considered men, and the training which we are now doing as scouts is intended to fill that want as far as possible. If every boy works hard at this course, and really learns all that we try to teach him, he will, at the end of it, have some claim to call himself a scout and a man, and we will find, if ever he goes on service, that he will have no difficulty in looking after himself, and in being really useful to his country.

7. There is an old Canadian scout and trapper, now over eighty years of age and still working at his trade of trapping. His name is Bill Hamilton. In a book which he lately wrote, called *My Sixty Years in the Plains*, he describes the dangers of that adventurous line of life. The

chief danger was that of falling into the hands of the Red Indians. "To be taken prisoner was to experience a death not at all to be desired. A slow fire is merciful beside other cruelties practised by the Indians. I have often been asked why we expose ourselves to such danger. My answer has always been that there is a charm in the open-air life of a scout from which one cannot free himself after he has once come under its spell. Give me the man who has been raised among the great things of nature: he cultivates truth, independence, and self-reliance; he has generous impulses; he is true to his friends, and true to the flag of his country."

8. I can fully endorse what this old scout has said, and, what is more, I find that those men who come from the farthest frontiers of the Empire—from what we should call a rude and savage life—are among the most generous and chivalrous of their race, especially towards women and weaker folk. They become "gentle men" by their contact with nature.

9. Mr. Roosevelt, an ex-president of the United States of America, also is one who believes in outdoor life. When returning from his hunting trip in East Africa, he inspected some boy scouts in London, and expressed great admiration for them. He writes:—

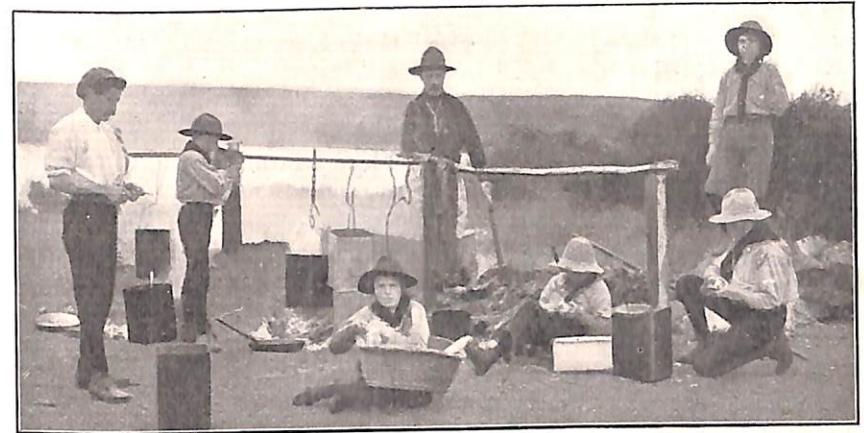
"I believe in outdoor games, and I do not mind in the least that they are rough games, or that those who take part in them are occasionally injured. I have no sympathy with the overwrought sentiment which would keep a young man in cotton-wool. The out-of-doors man must always prove the better in life's contest. When you play, play hard; and when you work, work hard. But do not let your play and your sport interfere with your study."

10. I knew an old Boer who, after the war, said that he could not live in the country with the British, because, when they arrived in the country, they were so "stom," as he called it—that is, so utterly stupid when living on the veldt that they did not know how to look after themselves, to make themselves comfortable in camp, to kill their food or to cook it, and they were always losing their way on the veldt. He allowed that, after six months or so, the English soldiers got to learn how to manage for themselves fairly well if they lived so long, but that they often died, and they generally died through blundering about at the business end of a mule.

11. The truth is that, being brought up in a civilized country like England, soldiers and others have no training whatever in looking after themselves out on the veldt or in the backwoods, and the consequence is that, when they go out to a colony or on a campaign, they are, for a long time, perfectly helpless, and go through a great deal of hardship and trouble which would not occur had they learnt, while they were boys, how to look after themselves both in camp and when on patrol; they are just "tenderfeet."

12. They have never had to light a fire or to cook their own food; that has always been done for them. At home, if they wanted water, they had merely to turn on the tap, and so they had no idea of how to set about finding water in a desert place by looking at the grass, or by scratching at the sand till they began to find signs of dampness; and, at home, if they were lost, or did not know the time, they had merely to "ask a policeman." They had always found houses to shelter them, and beds to lie on. They had never to manufacture these for themselves, nor to make their own boots or clothing.

13. That is why a "tenderfoot" talks of "roughing it in camp;" but living in camp, for a scout who knows the game, is by no means "roughing it." He knows how to make himself comfortable in a thousand



CAMP-FIRE COOKERY: BOY SCOUTS AND THEIR LEADERS.

small ways, and then, when he does come back to civilization, he enjoys it all the more through having seen a contrast; and, even there, he can do much more for himself than the ordinary mortal, who has never really learned to provide for his own wants. The man who has had to turn his hand to many things, as the scout does in camp, finds that, when he comes into civilization, he is more easily able to obtain employment, because he is ready to set his hand to whatever kind of work may turn up.

—From *Scouting for Boys*, by MAJOR-GENERAL
SIR ROBERT BADEN-POWELL, Chief Scout.

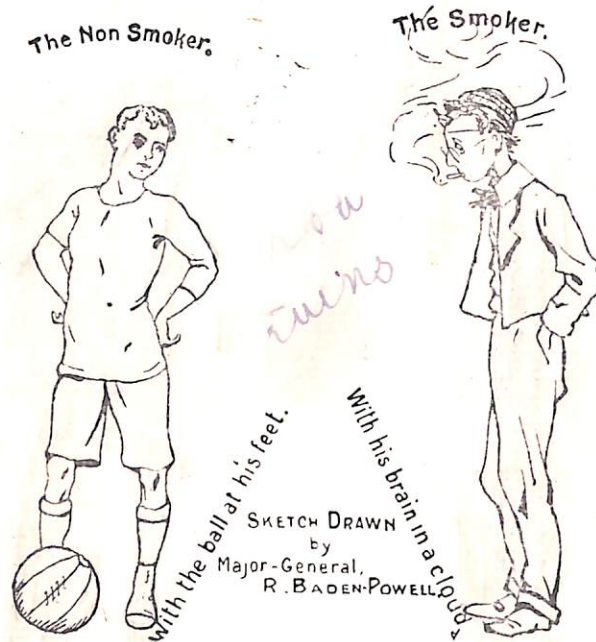
WHY BOYS SHOULD NOT SMOKE.

1. A boy may say, "I see plenty of men smoking, and it doesn't seem to do them any harm. Why shouldn't I smoke too?"
2. Who is the more easily hurt, you or your baby brother or sister? Would you give a young baby bread and butter to eat, or tea to drink? Would it be right to say, "It doesn't hurt other boys when I knock

them down at football, so it won't hurt the baby if I knock it down?" Would it be sensible to say, "Boys can eat meat and potatoes, so why shouldn't the baby have them too?" Why should this not be sensible? Because the baby is young and weak, and has not grown hard and strong like the boys.

3. Who would get tired the sooner during a long walk, you or a full-grown man? Can any of you kick a football as far as a grown-up player can? Can any of you hit a cricket ball as hard as a grown-up batsman? Would eight of you have any chance in a tug-of-war against eight men? Why do you say "no" to all these questions?

4. Compared with a man's body, your bodies are still young and weak—just as, compared with yours, the baby's body is weak. Is it



sensible, then, to say that, because something doesn't hurt a man, it won't hurt you?

5. Is your father any taller than he was last year? Are you taller than you were last year? How is it that you have grown? You have grown because you have had food and nourishment. Hasn't your father had any food and nourishment? What have they done for him? They have replaced waste—what was worn out. Have

your food and nourishment done this for you? Yes—as well as doing the other work of making you bigger and stronger. Your bodies have double work to do—fresh growth as well as repairs—and you can't afford to interfere with their work in any way. Things that may be quite harmless for the full-grown body may be very harmful for the growing one.

6. Take some green twigs and some dry sticks. Bend one of each. The green twig is weak, and bends easily; it is soft, and won't snap. The dry stick is hard and strong—difficult to bend, but, if bent much, it snaps. Your bones are like the green twigs. Many cases of broken bones in children are what doctors call "green-stick fractures": the

bones do not actually snap. You will not have full-grown, hard, strong bones till you are twenty, or older. If you want to grow tall and strong, you must give your body every chance of growing properly.

7. Now, doctors find that smoking stops the growth. Boys who smoke will never grow into such big and strong men as they would if they did not use tobacco. Besides your limbs, what part of your body must be well grown if you are going to be good at games? What do you mean by saying that a boy has good "wind"? You mean that his lungs are strong and healthy, and that he breathes without distress as he moves quickly. If a boy has a weak heart, the doctor won't let him play games or run races—the exertion might kill him.

8. All the doctors tell us that smoking is very bad for a boy's lungs and heart. When men are training for a race or for a football match, they smoke very little, if at all; it would be bad for their "wind." These are grown-up people, with full-grown lungs and heart; how much worse must smoking be for the boy whose heart and lungs are still tender and half-grown!

9. Is your brain full-grown yet? How do you know? Tobacco will be very bad for it. Boys who smoke don't give themselves a chance of getting on at school or in life afterwards.

10. Many men are harmed by tobacco; no man is harmed by not smoking. Boys cannot smoke without doing themselves harm.

—From *Laws of Health*, issued by the Education Department, Western Australia.

FATHER WILLIAM.

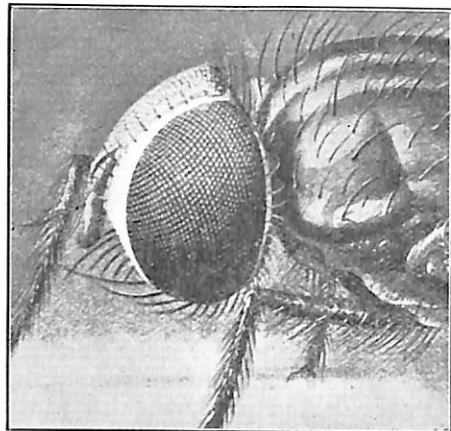
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|--|---|
| <p>1. "You are old, Father William,"
the young man cried;
"The few locks which are
left you are grey;
You are hale, Father William,
a hearty old man;
Now tell me the reason, I
pray."</p> | <p>3. "You are old, Father William,"
the young man cried,
"And pleasures with youth
pass away,
And yet you lament not the
days that are gone;
Now tell me the reason, I
pray."</p> |
| <p>2. "In the days of my youth,"
Father William replied,
"I remembered that youth
would fly fast,
And abused not my health
and my vigor at first,
That I never might need
them at last."</p> | <p>4. "In the days of my youth,"
Father William replied,
"I remembered that youth
could not last;
I thought of the future, what-
ever I did,
That I never might grieve
for the past."</p> |

—ROBERT SOUTHNEY (1774-1843), an English poet.

THE HOUSE-FLY: A MENACE TO HEALTH.

1. In warm weather, when flies are most active, they prove a source of much annoyance to everybody. In country places especially, these tiny creatures are a great pest. This and their disgusting habits of feeding are surely bad enough to condemn them. Much more, however, can be laid against them. They are now known to be a chief factor in the spread of disease, by carrying germs from the sick to the healthy, and from putrid matter to food.

2. Because these germs are exceedingly small, millions can find room on one fly. Further, as, under favorable conditions, they increase at a rapid rate, scientific men say that the drinking of a cup of tea into which a fly has fallen may result in the taking of a million or more germs into one's system. To catch a disease caused by germs, a person has to come into contact with them. No one, for example, gets typhoid unless he swallows the germs of typhoid. The germs must enter with the food he eats, or in the liquid he drinks, or from the glass or cup that he uses.



FLY'S EYE.

3. Of the flies found in and about houses, nine-tenths are of the domestic variety. To this kind alone do these remarks refer. When we look at one, we see that its body is cut into three distinct sections, and that to the middle one are attached two wings and six legs. Some insects, for example, the bee, have four wings, but the fly has only two. It does not seem to miss the second pair, for it can flit about as nimbly as any bee. The wings are so delicate that they can be seen through, and have the appearance of fine lace. Two little organs, somewhat resembling wings in shape, take the place of the second pair. These are called balancers, and are thought to steady the fly when in flight.

4. Boys and girls know how hard it is to catch a fly. This is partly owing to its wide range of vision. Each of its compound eyes is so large as to cover almost one side of its head. Under the microscope, these are seen to be made up of a great number of similar parts packed closely together. Out of all or most of these parts, the little creature can readily watch the movements of its would-be captor. On top of the head, in the space between the compound eyes, there are, in addition, three simple ones.

5. Of insects, there are two great classes—those that eat solid food, as the beetle, and those that suck up their food in a liquid

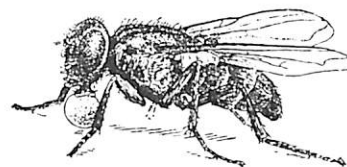
form, as the fly. Though the fly has neither jaws nor teeth, it has a wonderful contrivance that serves quite as well. The lips are drawn out into a short tube, by the help of which it sips up fluid, just as we suck up water through a straw. This ingenious contrivance the fly is able to extend at will; and, while it is at work, its action can be seen with the naked eye. Instead of taking food to the mouth, it sends the mouth for the food. At the end, the trunk spreads out somewhat in shape like a sucker. If the food at hand is liquid, the fly straightway sucks it up; if it is solid, the fly first wets it, and then proceeds to draw the fluid up. We moisten our food in the mouth; the fly does the same outside the mouth. In this way, it is able to feed on sugar or dried specks of milk and phlegm (*flem*).



TRUNK OF THE FLY.

6. From the mouth, the gullet passes through the head and neck into the thorax, where it divides into two branches, one going to the crop, the other into the stomach. The food passes first into the crop, and, after that is full, it flows into the stomach. The crop serves as a receptacle, and enables the insect to take in quickly a supply of food to be digested afterwards at its leisure.

7. Flies have the power of throwing back from the crop some of its fluid contents, which, as shown in the picture, take the form of drops.



From *House flies and How they Spread Disease*, by C. G. Hewitt (Cambridge University Press)

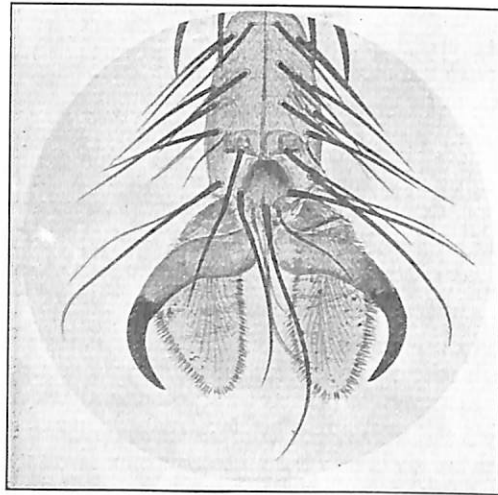
FLY THROWING BACK LIQUID FOOD.

This habit is common, and plays no small part in the spreading of disease. These drops are called vomits, and may be distinguished from the brown spots known to every housewife as "fly-specks." Disease germs abound in the vomits and the fly-specks, rendering both of them sources of much danger to health. This is especially the case in the summer season, when they become dry and are blown about in the air.

8. When a house-fly is placed under the microscope, its body, trunk, and legs are seen to be covered with numerous small hairs, and these

serve as good collectors of filth and germs. The legs especially act as small brushes to which the filth clings. From this, it is manifest that a fly will certainly infect any food to which it has access.

9. Perhaps young readers have at times wondered how a fly can run up the smooth window-pane, or along the ceiling, without slipping or falling. On the last joint of each leg is a pair of sharp, hooked claws, and underneath them are two soft pads or cushions. To a rough surface or a papered wall, a fly clings by the aid of its hooked claws. The pads are provided with many short tubes, from the ends of which flows a sticky fluid. This exudes only while the fly is in motion. The smoother the surface it runs on, the better the fly clings. All its life long, the fly's pads are sticky, and, as a consequence, they are never free from filth. The fly you see running over the food on the table has its pads clogged with disease germs. Among them may be the typhoid germ



JOINT OF FLY'S LEG SHOWING BRISTLES.

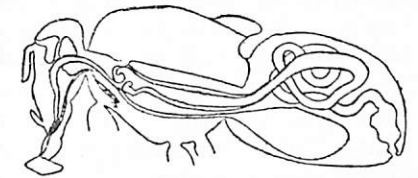
obtained at a visit to a sick-room, or the tubercle bacillus brought from the spittoon of a consumptive. Watch a fly actively cleaning its body and legs on the table, and you may be certain that it is getting rid of disease germs.

10. Flies do not deposit their eggs inside a house. The mother fly prefers the manure heap as a breeding-place. There the conditions of warmth and moisture are most favorable to fly production. The little creature that comes from the eggs has not the appearance of a fly, nor does it look as if it would ever become one. It is a white grub, and, for some days, does nothing but eat, and this it does with right good will. The larva, as it is called at this stage, is sure to find at hand plenty of suitable nourishment. The mother always takes care to deposit the eggs where there is suitable food for the larvæ. From the larval or growing stage, the future fly passes into the pupal or resting stage. Then the skin changes its color to a dark brown, and becomes a hard case, inside which, for some days, the pupa remains. The head, legs, and wings grow, and the little creature takes the form of a fly.

11. At this stage, you would not think it was alive. It does not see, it does not move. By and by, it wakens up, and comes forth a fly, complete with eyes, legs, and wings, the size of its mother. From a footless, headless, and light-shunning maggot, revelling in the manure pit, is

produced an active, sun-loving insect. The fly in this last stage does not grow. As soon as it leaves the dark-brown case, its growth is over, and it starts out fully equipped to spread disease far and wide.

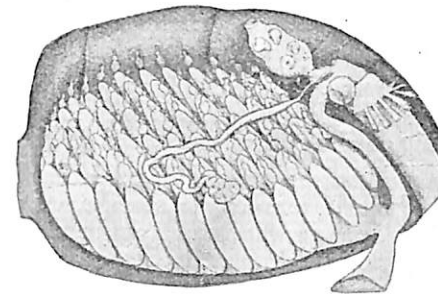
12. The feeding resorts of flies need not be their breeding places. On the one hand, they seek all kinds of decaying animal and vegetable matter in which to deposit their eggs. On the other, they freely light on food, much of which forms excellent nurseries for the rapid increase of the germs with which they are sure to be laden. Their habit of settling on the foulest of decomposing substances causes them to be a menace to health. Constantly flitting from filth to food, they convey the infective matter to the food. From foul and disease-infected places, they wing their way straight to the kitchen, the dining-room, and the nursery. They drag their foul legs across the bread, dip them in the butter, wipe them on the meat, and bathe them in the milk.



From *The Argus*.]

FLY'S CROP AND STOMACH.

13. It is difficult to estimate to what extent mankind suffers from the prevalence of the house-fly. The pest stands convicted of spreading typhoid, infantile diarrhœa, cholera, dysentery, consumption, and ophthalmia. The sputum of the consumptive has a special attraction for flies. Upon it, they feed with avidity, and subsequently excrete the bacilli upon food. Thus does the fly aid in spreading consumption. Flies act, as we have seen, as the go-between, bringing germs from filth to human beings. "Far from looking upon them as dipterous angels dancing attendance on Hygeia, regard them rather in the light of winged sponges speeding hither and thither to carry out the behests of Contagion." Outbreaks of intestinal diseases causing many deaths among young children are frequent whenever and wherever flies are in large numbers, and they, more than the summer heat, are the direct agents in the spread of such diseases.



From *House-flies and How they Spread Disease*, by C. G. Hewitt (Cambridge University Press).]

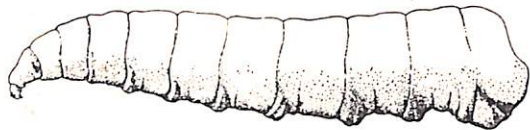
FLY'S EGGS AND EGG-PLACER.

14. How then can the fly nuisance be checked? The main point of attack is obvious. The supply of flies must be cut off, and this can be managed only by wiping out the breeding places of the pest. Till the necessity for this is realized, other means will be of little value. Further, in a contest against so formidable a foe, the whole community must be enlisted, for, in the fight, individual effort as well as official action is

essential. By systematic effort, flies may be so lessened as no longer to remain a menace to health.

15. Flies breed chiefly in the manure pit, amid garbage when it is left exposed, and, generally, in any organic refuse to which they can gain access. The object to be steadily kept in view is to prevent their depositing their eggs on substances furnishing food for the larvæ. Let it also be always borne in mind that the fly is a foul marauder, revelling in all manner of abominable nastiness, and that its absence or prevalence affords a fair indication of the attention or inattention paid to sanitary matters. Organic refuse of any kind should not be permitted to gather, especially near buildings such as schools, hotels, shops, eating-places, and dairies. Tips are a prolific source of flies, and they should be replaced by destructors (see page 14). Strict cleanliness should be observed in the housing of domestic animals. No horse manure or other decaying matter should be allowed to remain, even in winter, longer than a week in any one place, and that awaiting removal should be stored in suitable flyproof receptacles.

16. Recognizing the need for the last precaution, the councils of some cities in the United States insist that, where horses or cows are kept,



From *House-flies and How they Spread Disease*, by C. G. Hewitt (Cambridge University Press.)

LARVA OF FLY.

properly constructed fly-proof pits shall be provided for the temporary storage of the manure. In addition, chloride of lime should be scattered over the floors of the stables when they are cleaned out. One great advantage from this use of lime is that the horses, instead of being incessantly pestered by flies will be able to rest, and so be rendered fitter for work. It is said that, in Venice, where there are no horses, there are no flies.

17. If neglect in these respects is allowed to continue, the health of the community, sooner or later, will pay for it. A serious responsibility lies on the local authorities that permit insanitary conditions to exist. They should set an example by doing away with municipal tips, substituting approved sanitary methods for the disposal of filth and refuse, and last, but by no means least, by making every endeavor to secure an effective system of dealing with sewage. The abolition of the insanitary privy is a necessary step in the control of the house-fly and the improvement of sanitary conditions generally.

18. Boston, it is claimed, has been freed from the fly nuisance by the simple plan of requiring the removal of manure from stables every day, and the covering up closely of all garbage. Destroying the fly's breeding places is likely to be more effective than "swatting" the fly when it has become fully grown.

—SAMUEL SUMMONS, M.A., LL.B., ex-Inspector of Schools.

ACCIDENTS AND EMERGENCIES: WHAT TO DO TILL THE DOCTOR COMES.

There should be in every home a place known to every member of the household (but out of the way of the children) where are kept ready for immediate use the following articles, which can be obtained from a chemist:—A pair of scissors, three or four large needles (threaded), a few prepared bandages, some lint, oil silk, cotton wool for padding, olive oil, and a bottle of boracic or carbolic acid solution. [You are recommended, also, to obtain, if possible, practical instruction at a St. John Ambulance Association class. Every family should have at least one certificated member of the Association.]

Bruises and Sprains.—If a bruise can be treated at once, apply cold water, and keep the part at perfect rest; otherwise, apply relays of hot fomentations, still keeping the part at rest. Later, apply warmth and very gentle friction, with cotton wool and bandage. Sprains require perfect rest and support. Immediate plunging in cold water may prevent swelling, but warm applications are necessary to remove it, with cotton wool and bandaging for some days. A day's absolute rest at the time of accident is worth a month's afterwards; therefore, never neglect a sprain.

Burns and Scalds.—Carefully remove or cut off clothing, and avoid breaking any blisters. If the injury is slight, and no wound exists, immerse the part in cold water. If severe, cover at once with flour, or with a mixture of equal parts of olive oil or linseed oil and lime water, and wrap carefully in cotton wool so as to keep out all air. Leave the dressing on as long as possible. If your dress catches fire, throw yourself at once flat on the ground and roll over. Bystanders should stifle the flames with water, rugs, or whatever is at hand, but beware of their own dresses. Remember, fire runs upwards.

Broken Bones.—Do not move the patient more than is absolutely necessary. (1) Slit the seam of the coat or trousers to get at the part. (2) Place the part in the natural position, and keep it so with bandages and padded splints. (Padded portions of a broken box, rolls of newspapers, umbrellas, sticks, "stay bones," or the straw envelopes of bottles, make suitable splints.) (3) If a leg is broken, after applying the splints, tie the injured and the sound leg together at ankle and knee, and gently place patient on a piece of board or shutter, but never remove the patient until the whole leg is safely supported. More injury is often done after the accident than by the accident itself, especially in the case of the thigh.

Bleeding from the Nose.—Apply cold water compresses to the nose, forehead, or back of neck. If alone, compress the nostril with the opposite hand. If these fail, inject alum in powder or in solution into the nostrils, or plug the nose with cotton wool saturated with the solution.

Choking.—Open the mouth, and with one or two fingers hook out or displace the foreign body. Slap the back, and hold the child upside down for a few seconds.

Convulsions in Infants.—Place the child at once in a warm bath of about 105°, and leave for ten minutes if necessary, at the same time applying an iced cloth to the head. Give two to six teaspoonfuls of ipecacuanha wine, or half a tumbler of mustard and water, and a dose of castor oil afterwards.

Drowning.—See special lesson in this month's *The School Paper—Grades V. and VI.*

Fits in Adults.—If you are sure it is a fainting fit only, as from fright, fatigue, bleeding, or the like, keep the head low. Neglect to do this has caused many deaths. Later on, give warm tea. In all other fits, raise the head slightly; prevent self-injury; see that breathing is easy; keep warm; and do not give anything by the mouth.

Foreign Bodies in the Eye.—Don't rub. Bathe the eye well. If lime or mortar is present, use weak vinegar and water or sugar and water. If still in the upper lid, turn the lid over a pencil by pulling the eyelashes upwards, and brush it off gently with a handkerchief or a camel's-hair brush. Afterwards drop some oil between the lids, and keep the eye closed.

Foreign Bodies in the Ear.—Don't meddle unless the foreign body is so near that it can be seen; otherwise you may do much mischief. You may pour some warm oil in, and cover gently with cotton wool. In case of children, prevent meddling.

Onset of Cold, Rheumatism, &c.—Try a hot mustard footbath until the feet are reddened, or general hot bath, with a hot drink, and sleeping in the blankets.

Poisoning.—Except where the mouth and throat are corroded, produce vomiting by giving one or two tablespoonfuls of mustard or common salt, in a cupful of warm water. (1) If there are pain and purging, give two teaspoonfuls of chalk, whiting, or magnesia

in a tumbler of milk and water, repeating from time to time. (2) If the patient is sleepy, keep him awake by walking him about, and give him strong coffee; keep him warm, and, if necessary, promote breathing artificially as in a case of drowning.

Snake Bite.—See special lesson in this month's number of *The School Paper—Grades V. and VI. Stings of Insects.*—At once apply vinegar, baking soda, or liquid ammonia.

Suffocation.—Fresh air at once; clear the throat; loosen everything around the chest; dash cold water in the face; apply smelling salts. Continue as in a case of drowning.

Sunstroke generally occurs from over-exertion or over-drinking in hot weather. It may come on without exposure to the sun's rays. Real sunstroke should be distinguished from mere fainting from weakness or exhaustion. Remove to a cool place, apply cold water freely to the head, and, if the skin is hot and flushed, sponge it with cold water. Spirits or other stimulants should not be given. All drinks should be cold.

Wounds and Cuts.—Wash the wounds thoroughly with cold boiled water (after your own hands have been thoroughly cleansed), containing a very little carbolic or boracic acid; see that the bleeding ceases; apply cold-water dressings, oil silk, and bandage. If bleeding is severe—(1) Raise the limb and apply pressure directly over the wound, either by clean finger or rolled-up clean handkerchief. (2) If the bleeding continues bright scarlet and in spurts, press with the fingers, or tighten a bandage round the limb on the side nearest the heart, if necessary after direct pressure over the wound and elevation of the limb. (3) If the blood is dark, and in a stream, tighten the ligature on the side away from the heart. An elastic gas-tube, pair of braces, or garters form good ligatures. (4) Relax the ligature a little every ten minutes, if you have completely stopped the circulation. Afterwards treat the wound as above, and keep at rest. Remember that profuse or prolonged bleeding may be fatal, and that the bleeding must be stopped before the wound is bound up.

NOTE.—These hints are not intended to do instead of the doctor. Send to him at once when anything serious is the matter.

—From *Wall Sheet No. 2* of the Australian Health Society, Melbourne.

TIMELY ADVICE REGARDING TEETH.

Aids to help you to have pretty and sound teeth and a sweet breath:—

1. Chew your food slowly and thoroughly; thorough chewing helps to keep the teeth and gums clean and healthy.
2. Brush your teeth thoroughly, and always before going to bed.
3. Brush your teeth from the gums toward the cutting edge. Brushing crosswise does not remove particles from between, and it causes unnecessary wear to the teeth, and injures the gums.
4. Brush the inner sides of the teeth to prevent tartar from forming.
5. Draw some floss silk between the teeth so as to clean the parts that the brush may not always touch.

RULES FOR HEALTH.

The Women's Imperial Health Association of England has just issued rules for young people who are members of the Children's Health Crusade. These rules are a series of promises which the youthful members try to fulfil. The following are a few of the rules:—

1. I will try to have my bedroom window open at the top and bottom at night as well as by day.
2. I will try to keep my head, face, hands, and finger nails as clean as possible.
3. I will clean my teeth and rinse my mouth every morning on getting up, and at night on going to bed.
4. I will always wash my hands before eating food.
5. I will try to breathe through my nose by keeping my mouth shut.
6. I will not spit upon floors, stairways, or footpaths.

By Authority: ALBERT J. MULLETT, Government Printer, Melbourne.