Facts First

ON NARCOTICS

ALCOHOL
DRUGS &
TOBACCO

by
JOHN C. ALMACK, Ph.D.

FACTS FIRST
ON NARCOTICS

FOR THE
INTERMEDIATE
GRADES

FACTS FIRST
ON NARCOTICS

Alcohol, Tobacco, Marihuana,
. . Opium, and Cocaine . .

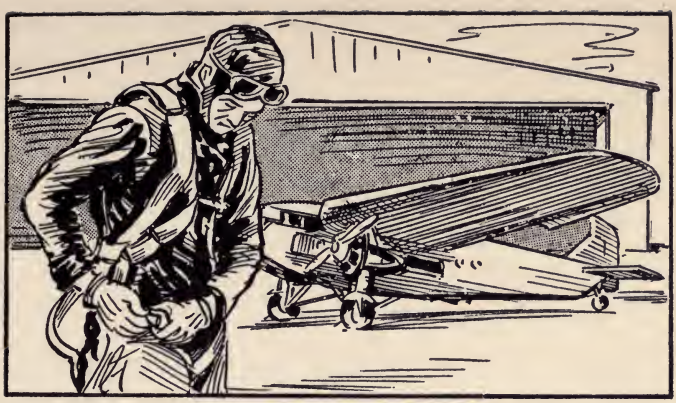
by JOHN C. ALMACK, Ph.D.
Professor of Education
Stanford University, California

AUTHOR OF

A Clear Case Against Narcotics, Education for Citizenship, Hygiene of the School Child (with L. M. Terman), Modern School Administration, The Beginning Teacher (with A. R. Lang), The Stanford Spelling Series (with E. H. Staffelbach), Research and Thesis Writing, History of the United States (with E. D. Adams), Problems of the Teaching Profession (with A. R. Lang), The School Board Member, et cetera.

1939
PACIFIC PRESS PUBLISHING ASSOCIATION
MOUNTAIN VIEW, CALIFORNIA
Omaha, Nebraska Cristobal, Canal Zone Portland, Oregon

TABLE OF CONTENTS



An aviator, to continue flying, cannot take chances with his health.

HOW IT BEGAN

ONE day a noted flyer came to Elm Grove School. He spoke in the assembly hall. All the children went to hear him. He told about airplanes and flying. He told about Corrigan and Lindbergh.

"After Lindbergh arrived in Paris," said the speaker, "he was often offered wine. He always politely refused it. 'I do not drink anything but water,' he said. This is a good motto for today," the speaker went on. "Boys and girls who want to succeed in work or in sports must have steady hands, quick muscles, and clear eyes. They should not use narcotics in any form."

After Miss Lane's class had gone back to the home room, Jerry asked, "What are narcotics, Miss Lane?"

"Narcotics are those drugs which when taken into the body slow down speed, numb the feelings, and reduce strength," answered Miss Lane; "in large doses, they cause stupor and death.

"The word *narcotics* is very old," their teacher continued. "It was used by the Greeks more than two thousand years ago. They knew about both alcohol and opium. They called these things narcotics because they benumbed and stupefied those who used them.

"The Greeks also had another word that meant about the same as narcotics. This word was *intoxicants.* It meant a deadly kind of poison that savages put on their arrows to kill their enemies. In time, the Greeks came to call any poison a *toxin,* and intoxicant meant a poison taken into the body.

"Today when you see a word in which the syllable *tox* appears, you will know it refers to poison."

"What are some of the common narcotics of today?" asked Joe.

"There are many common narcotics," replied Miss Lane. "I shall write the names of some of them on the board, and tell you how to pronounce them."

Miss Lane wrote this list of narcotics:

alcohol (al′ ko-hol)	opium (o′ pi-um)
chloroform (klō′ ro-form)	morphine (mor′ fēn)
tobacco (to-bak′ o)	heroin (her′ ō-in)
marihuana (ma-re-hwa′ na)	cocaine (ko-kān′)

"I thought alcohol was a stimulant," said Betty.

"Years ago, it was believed that alcohol was a stimulant, but now it is known to have narcotic effects. This is what Dr. Haven Emerson says in his book, '*Alcohol—Its Effects on Man*,' page 13:

" 'Among the best-known narcotics is alcohol. It is slower than ether or chloroform, but it has a very similar effect.'

"Many others who have studied the effects of alcohol also say that alcohol is a narcotic. Here are the words of the British Medical Research Council:

" 'The direct effect of alcohol upon the nervous system is in all stages to depress or stop its work. It is from first to last a narcotic drug.' "

"Then what is a stimulant?" was Joe's next question.

Miss Lane smiled. "The best way to answer that question is to go back into the past.

"Long ago, the Romans used oxen to pull their carts and plows. To make the oxen pull harder or

walk faster, the drivers pricked them with a goad. A goad is a sharp thorn or piece of metal on a long stick. This goad was known as a *stimulus*.

"The goad caused pain, and roused the oxen to greater effort.

"From the Roman word *stimulus*, we get our words stimulate and stimulant. A stimulant is anything that leads quickly to the outlay of greater speed and strength.

"A stimulant speeds up; a narcotic slows down and weakens. You see that a narcotic is just the opposite of a stimulant. A narcotic is anything that decreases or depresses the feelings, speed, and power. Alcohol, opium, morphine, cocaine, marihuana, and tobacco are all narcotics. They tend to slow us down."

"I think we should know more about narcotics," said Joe.

"Yes, it is important that you know how to take care of yourselves," said Miss Lane. "Long ago, we plowed with oxen; we traveled in oxcarts. Even in those days, clear eyes, steady hands, and quick muscles helped us greatly. They made men a success in hunting, working, and running.

"In these days of air travel, of swift automobiles, and of fast, strong machines, sound bodies are the best wealth. You will become aviators, athletes, doc-

tors, farmers, builders, teachers. All of you want to work and play; to be strong and happy; to live long, useful lives. Let us find out *the facts about narcotics* and how they injure bodies and minds. We shall know why we should leave them alone."

"I should like to tell the class all I can learn about alcohol—what it is and how it is made and what it is used for," said Jerry.

"I shall find out how alcohol affects the growth of plants and animals," said Harry.

"I am interested in learning how alcohol affects our ability to play and to learn," said John.

"And I should like to report to the class on the effect of alcohol on speed and strength. My report will deal with athletes and workers," said Frank.

"My report will take up the effects of alcohol on health and the length of life," said Mary.

"I shall tell the story of opium, and of some of the ways in which it is harmful to man," said Betty.

"My story shall also be about opium," said Dan. "I shall also tell about other drugs and medicines that have bad effects on the body."

"A few days ago I read that a new drug has come to the notice of the police," said Joe. "The paper said that it is being used by young people. It is called marihuana. I shall find out what I can about it."

"I am interested in harmful medicines," said Helen. "We have a new book at home, which warns us against bromides. I shall read about it and other drugs like it."

"Tobacco is the most widely used of all narcotics," said James. "I should like to know what it is like and how it is produced."

"I read about the use of tobacco a long time ago," said Bob, "and I should like to learn more about its history."

"This leaves a good topic for me," said Carl. "I shall tell about the harmful effects of tobacco on the body, and will show how it affects growth, learning, and strength."

Dorothy's subject was the last. "I shall tell more about tobacco, and will see what I can find about the best way to quit the tobacco habit."

In the next sections, you will find the stories the children of the Elm Grove School told about these narcotics: alcohol, opium, cocaine, marihuana, and tobacco.

To help you get ready to read and understand these stories, on the very next page you will find a list of things to do and of other stories to read.

Things to Do

1. Make up a little dictionary of your own to use in reading these stories. Put in such words as these, and add more later. It is best to put your words in alphabetical order; to do this, write them on little cards, a word to a card:

narcotic	intoxicate	protoplasm	hypodermic
anesthetic	athletics	precision	addict
nicotine	stimulus	tuberculosis	assassin
fermentation	antiseptic	obesity	toxin
alcohol	experiment	dipsomaniac	delirium

2. Also make up what you may call a black list of narcotics. Try to arrange it so that the worst come first. After you read this book, you may want to rearrange your words.
3. Make a poster on which you write the leading kinds of jobs in your community, such as farming, law, business, medicine, building, plumbing, teaching, et cetera. You may indicate these jobs with pictures; perhaps you can find the pictures in magazines. After each kind of job, write what abilities the job takes, such as steady hands, good health, clear vision, and good nature.
4. Put on an exhibit of empty boxes, used labels, signs, and advertising of narcotics. Label them as toxins, intoxicants, poisons, alcohol, tobacco, or other terms.

For Review and Test

1. Ben said, "I read a book which said alcohol is a stimulant." Was the book right?
2. What is the difference between a stimulant and a narcotic?
3. What did Lindbergh say when he was offered wine?

4. Give as many words as you can which mean about the same as narcotic.
5. What narcotic is the most widely used of all?

Notes About Books

In Dr. Bogen's book, *"What About Alcohol?"* you will find some good pictures and many facts. You might start by reading pages 63-68. In *"Youth Studies Alcohol,"* by Harkness and Fort, you can learn whether alcohol is a stimulant or not. See pages 39-68. This book may be too hard for you to read; if it is, you may try Margaret Baker's little book, *"The Three Partners."*

For father and mother, there is an interesting magazine story called "Study Characters to Find Out Why Some Become Topers." It is in *Science News Letter,* vol. 33, p. 200 (March 26, 1938).

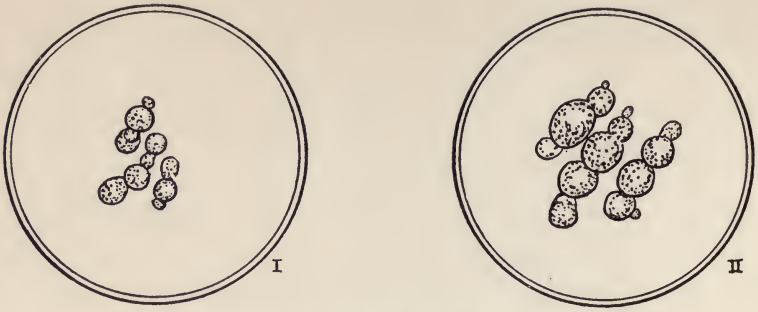
Yeast grows in sweetened water.

JERRY'S STORY

ALCOHOL: *What It Is; Where It Comes From; What It Is Used For*

"ALCOHOL is a liquid as clear as water," said Jerry. "It weighs less than water, and has a sharp, burning taste. Water puts out fire; but alcohol burns with a hot blue flame, and does not give much light or smoke.

"You know that fruit and fruit juices, if left in the warm open air, will spoil. The juice has a sour smell and a biting taste, due to alcohol, which has been formed in the juice. Alcohol is made by tiny yeast plants.



Yeast plants. Note the tiny buds.

"The spores of yeast float in the air everywhere except on mountaintops and in very cold lands. When they fall into fruit juices or sweetened water, they grow into yeast plants and use up the sugar for food.

"This is a way you can test the growth of yeast: Put a few spoonfuls of sugar into a jar of water and stir in a small piece of yeast. Leave it open so the air can get to it; keep it in a warm place.

"In a few days, bubbles of gas will rise to the top of the jar. Is it boiling? Latin people used to think so, and that is why they called this action of the yeast plants, *fermentation*, which means to boil.

"Let us look at the yeast plants under a microscope. See, they are small cells, almost round, joined to each other to form branches. The end of each branch looks like a bud, and it is there that a new cell or plant will grow.

"Nothing grows without food. The yeast plants eat the sugar that was put into the water. A chemist describes sugar as $C_{12}H_{22}O_{11}$, which means it is 12 atoms (the smallest particles of anything) of carbon, 22 atoms of hydrogen, and 11 atoms of oxygen.

"After the yeast plants have eaten all the food (sugar), they die. The dead bodies stay in the jar. The only elements that have escaped are the carbon dioxide (which rose to the surface in bubbles and passed into the air), a little oxygen, and a little water that passed off as vapor.

"If you put more sugar into the jar before the yeast plants die, growth will go on until the alcohol is about 15 per cent of the contents. New growth of yeast will not take place in alcohol.

"Now let us see what is left in the jar after fermentation stops:

Alcohol 3 to 18 per cent
Water 89 to 71 per cent
Waste 8 per cent (in sugar or juice and in dead cells of yeast plant)

"If grape juice is fermented, the residue (what is left) is called *wine*. It is from 8 to 18 per cent alcohol. If sprouted grains are fermented, the residue is called *beer* and *ale*. They are from 3 to 8 per cent alcohol.

"*Wine, beer,* and *ale* are called fermented liquors. They contain alcohol, water, a little flavoring, and waste materials.

"For a long time people did not know how to take the alcohol out of fermented liquors. How to do this was learned about the year 1000 by an Arab alchemist who was looking for a drink that would restore youth. This new elixir made those who drank it act like madmen, so it was called in the Arab tongue *al gohol,* which is said to mean *evil spirit.* Hence we get the word *alcohol.* Another derivation given is a root word meaning something prepared by reducing down, as in distillation.

"That he was able to separate the bad spirit, alcohol, from the water was due to the fact that alcohol boils at a lower temperature than water; therefore when they are heated together, the alcohol evaporates first. If the temperature is kept near the boiling point of alcohol, and is not allowed to rise above this, all the alcohol will boil off, with some of the water.

"The trick is to catch the alcohol vapor and turn it back into liquid. The warm vapor is led off through a coil of pipe, called a worm, that passes under a cooling jet or through a tank of cold water. Drop by drop the alcohol vapor is condensed into liquid, and flows into a cask or bottle as clear, biting alcohol.

"Alcohol is distilled and added to many kinds of fermented liquor. These drinks are usually very strong. If they come from fermented grains, they are called whisky; if from sugar or molasses, they are called rum.

"Many of the drinks that are called by these names are made of alcohol, water, coloring matter, and a little flavoring. Distilled liquors contain from 24 to 50 per cent alcohol.

"Since alcohol has become known as a narcotic and a poison to the body, the use of fermented or distilled liquors for drinking should now be a thing of the past. Its main use from now on should be as a chemical.

"As a chemical, *alcohol is a solvent.* This means it dissolves fats, oils, gums, and many other things. This makes it useful in drugs and medicines, in cleaning and dyeing, and in paints and varnishes.

"Alcohol *is a dehydrator.* This means that it takes water from anything it touches. It hardens and preserves dead plants and animals. It is used as an embalming fluid for the preservation of dead bodies.

"*Alcohol kills life, and keeps it from growing.* It is often used in germicides or disinfectants, and in antiseptics, which keep germs from growing.

"The 'Alcohol Quints' are known as killers, for they will all kill, in the doses listed below, in one or two days. This table shows, beyond a doubt, how poisonous they are. You will see that ethyl, the usual alcohol in drinks, causes *death* in doses of 6 to 7 grams per kilogram (2.2046 pounds) of body weight.

Kind of Alcohol	Grams per Kilogram of Body Weight	Relative Toxicity
Methyl	7.2 to 9.2	0.8
Ethyl	6.25 to 7.44	1
Propyl	3.00 to 3.46	2
Butyl	2.1 to 2.44	3
Amyl	1.7 to 1.95	4

"*Alcohol does not freeze easily.* Thousands of gallons are used every year in antifreeze mixtures, which are put into the radiators of automobiles to prevent the freezing up of the cooling system during cold weather. For the same reason, alcohol is put into thermometers.

"*Alcohol burns easily.* It is used in laboratories, in lamps and stoves for heating, and it can furnish motor power as gasoline does.

"Next to water, alcohol is said to be the most useful product in modern industry. It is used in the manufacture, compounding, and preservation of the following articles:

rayon	artificial leather	paint
ether	billiard balls	lacquer
morphine	automobile seats	varnish
drugs	embalming fluid	ink
flavoring extracts	antifreeze mixture	pencils
shoe polish	photographic films	iodoform
cosmetics	disinfectants	antiseptics
	perfumes	chloroform

"Because alcohol is useful in industry does not mean that it is safe for anyone to drink it. No one would want to take embalming fluid or antifreeze mixture into his stomach, nor would he care to drink ink or shoe polish.

"I have told you what alcohol is, how it is made, and what it is used for. Harry will tell you its effects on living things."

Things to Do

1. Put some yeast in sweetened water and watch what happens. If you have a microscope, look at the plants and sketch them.
2. Make a large poster for the Bulletin Board, comparing the amount of alcohol in beer, light wine, fortified wine, and whisky.
3. Collect samples or pictures of things that require alcohol in their manufacture, compounding, or preservation.
4. Prepare a list of tests for posting on the Bulletin Board, which give proof that alcohol is a poison.

5. Put some water over a piece of bread in a glass. The bread softens. Put alcohol over the bread. What happens?
6. Dissolve salt in a little water. Add a few drops of alcohol. What happens?
7. Add water to a small piece of camphor gum or resin. Use alcohol instead of water. What happens? Now add water to the alcohol and camphor.

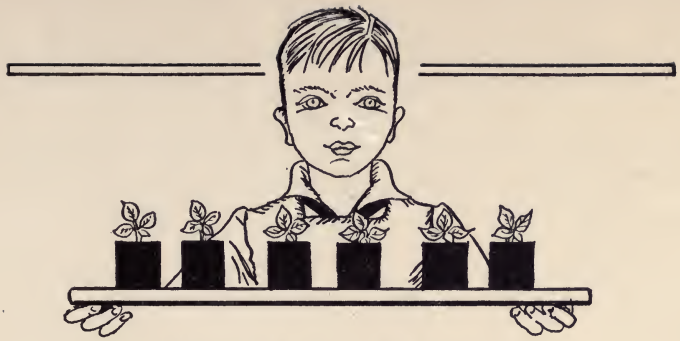
For Review and Test

1. Why was alcohol once known as an elixir?
2. How was the distillation process discovered?
3. What is the origin of the name, alcohol?
4. What is a food?
   Is alcohol a food?
   Will it repair waste of cells?
   Will it cause growth of cells?

Notes on Books

In Chapter II of Dr. Bogen's book, *"What About Alcohol?"* you will find a clear account of how alcohol is made. In Unit I of Dr. Donnelly's book, *"Alcohol and the Habit-Forming Drugs,"* you may learn (1) what alcohol is, (2) how it is made, and (3) how it is used. On pages 18-21 of *"Alcohol and the New Age"* Deets Pickett compares alcohol with food and water.

In the magazines see: "You Go to My Head," an illustrated article in *Scholastic,* vol. 33, p. 9 (Sept. 24, 1938).



Green plants will not grow in alcohol.

HARRY'S STORY

ALCOHOL: *Its Effects on the Growth of Plants and Animals*

"TO SHOW whether alcohol results in growth, I have made several experiments," said Harry. "I shall tell you what these experiments were, and the results:

"EXPERIMENT 1: I put fifty cucumber seeds in a 3 per cent alcohol solution, and fifty of the same quality of seeds in moist soil. Only four of the seeds in alcohol sprouted, while forty-six of the seeds in soil grew. Seeds do not grow in alcohol.

"EXPERIMENT 2: I took six strong bean plants in cans. To two of them I gave pure water; to two

others I gave a 3 per cent solution of alcohol; to the other two I gave neither water nor alcohol. The watered plants grew fast; the dry plants grew for a few days; but the alcohol plants did not grow at all. This proved to me that alcohol retards the growth of plants.

"I also read of experiments by others," Harry went on. "In Dr. Emerson's book, '*Alcohol and Man,*' a writer says (page 93) that the eggs of a sea urchin or of a starfish will not hatch if they are kept in a strong solution of alcohol. If they are kept in a weak solution, the eggs that hatch produce deformed young.

"Dr. G. P. Frets reports a study of the growth of guinea pigs. The pigs that had no alcohol weighed 77 grams at birth; at the age of a month they weighed 228 grams; at three months, 425 grams. Pigs given alcohol weighed 70 grams at birth, 214 grams when they were one month old, and 404 grams when three months old. The average difference in growth is about 7 per cent.

"Dr. Charles R. Stockard said that animals fed alcohol are small, timid, and excitable.

"Dr. C. F. Hodge tested the growth of yeast in alcohol. I will show the results of the test in a table that I will put on the board. The table shows the

outcome of a race in which the yeast plants that had no alcohol are seen to win:

GROWTH OF YEAST PLANTS

Per Cent of Alcohol	In 48 Hours	In 72 Hours
0	1,102	2,061
0.001	999	1,191
0.01	912	992
0.1	602	852
1.0	216	
5.0		69

"Nothing will grow without food. The question is, 'Is alcohol a food?'

"Mr. C. C. Weeks says: 'Alcohol is not a food. . . . A food acts in several ways: in building up tissue, in giving energy for work, and in keeping up bodily heat.' Moreover, a food must do no harm.

"Alcohol does not build up or repair any cell or tissue. It does harm. It does not help, but retards growth.

"In 1917, the American Medical Association said: 'We believe that the use of alcohol . . . as a food has no scientific basis.'

"When proof was given that alcohol is a toxin (poison), it was proved that alcohol is not a food. Studies of the effects of poisons show that the toxins of a low form of life are also toxins of all forms of life of a higher order. Plants, yeast, sea urchins,

guinea pigs, kittens, puppies, chickens, and rabbits will not grow on alcohol; it is not a food for boys and girls or for men and women.

"Vitamins are needed for growth, and alcohol contains no vitamins. Because of this lack, a person who takes alcohol may become underfed, with paralysis and wasting of the muscles, especially of the muscles of the leg. This seems more severe in women (Henderson, "*A New Deal in Liquor*," pages 124, 125).

"Dr. Haven Emerson says: 'At best no more than 10 cubic centimeters (about 2 teaspoonfuls) can be burned up in the body in an hour.' Alcohol above that amount piles up in the blood and cells, and stops the work of the body. Two tablespoonfuls are enough to slow speed and lower strength for three hours.

"Is it then true that alcohol is an energy (work) food? Scientists of yesterday say, 'Yes'; scientists of today say, 'No.' The energy which the older scientists have traced to the burning of alcohol may come from its effect on glands, in which process more sugar is set free in the blood. This blood sugar comes from other foods, not from alcohol.

"In studies of the growth of more than 20,000 Swedish children, Dr. Laitinen (Läit'e-nĕn) found

A Swedish doctor found that children in nonalcoholic homes grow faster.

that children from homes where no alcohol was drunk grew close to 10 per cent more in eight months than did children from drinking families.

"If such a difference continues throughout growth life, let us see what it means for boys and girls 10, 11, and 12 years old in height and weight, in comparison with the averages for such ages.

Age at Nearest Birthday	Height Average	Boys 10%+	Height Average	Girls 10%+	Weight Average	Boys 10%+	Weight Average	Girls 10%+
10	53.5	58.8	53.1	58.4	65.2	71.7	67.2	73.9
11	55.3	60.8	55.3	60.8	71.1	78.2	74.1	81.5
12	56.9	62.2	57.6	63.3	78.0	85.8	83.9	92.2

"There is another way in which the nonuse of alcohol in the body might help the growth of children. More money would be on hand to use for milk and

other healthful foods. The price of a pint of whisky will buy ten or more quarts of milk; a bottle of beer costs twice as much as a bottle of milk.

"Dr. George E. G. Catlin, speaking of this, says that in England and Wales 2/5 of a pint of milk a day is drunk; in Sweden 1½ pints, and in Norway and the United States, 1 pint; that an extra half pint of milk a day can change the average gain in weight of a boy from 3.85 pounds to 6.98 pounds a year, and of height, from 1.84 inches to 2.63 inches a year.

"Yet the practice in many English towns, he says, is to spend 3 shillings a week on liquor and 3 pence a week on milk.

"All modern scientists agree that beer is not 'liquid bread,' as once was claimed. 'Food in beer, such as it is,' says Dr. Emerson (*"Alcohol, Its Effects on Man,"* page 30), 'costs 4½ times as much as milk, and 8 times as much as bread.'

"Alcohol, beer, wine, and ale cannot take the place of any food. A person who tried to live on a diet of one or all these drinks would soon starve to death.

"The facts of modern science show that alcohol does not supply food for growth, and that it is harmful to all life forms.

"John will now tell you how alcohol affects work of the body and the mind."

Things to Do

1. Put yeast in sweetened water. In how many days does it stop growing? Why?
2. Cover some large seeds with alcohol, and let them stand three days. Then plant the seeds. Keep a record of the number of seeds, the number that come up, et cetera. It is a good plan to keep a check on the seeds by planting some of them without putting them into alcohol.
3. Find out if you can stop the growth of yeasts, seeds, or plants with alcohol.
4. Put some yeast into bread dough, and keep it warm. What happens? Where does the alcohol go when yeast bread is baked?
5. Make a chart for the Bulletin Board, showing the things you can buy that you would like to have with the money a man spends in a year buying each day two glasses of beer at five cents a glass.

For Review and Test

1. What is the effect of stunting the growth of young animals?
   Will they catch up in growth?
2. What are some of the best foods for growth?
3. How does alcohol affect the growth of young plants?
4. Is it true that alcohol adds any food to the body?
   Is alcohol changed in the stomach?

Notes on Books

See Chapter IV in *"What About Alcohol?"* by Dr. Bogen for the answer to the question, "Does alcohol help growth?"

Dr. Donnelly tells you the effect of alcohol on body cells in Chapter V of *"Alcohol and the Habit-Forming Drugs."*

You will find many clever pictures in L. H. Caldwell's little book, *"Answers to Alcohol,"* and, on pages 32-34, he tells you what a food expert thinks of it.

In the magazines, see "Found in a Bottle," in *Collier's*, vol. 100, p. 16 (Oct. 23, 1937).

If the *Reader's Guide to Periodical Literature* is in your school library, consult it for other recent articles on alcohol and allied subjects. Magazine articles are especially valuable for class reports.

A cancellation test—"A, V, and Y."

JOHN'S STORY

ALCOHOL: *Its Effects on the Ability to Play and to Learn*

"DO YOU like to swim?" asked John.

All the class answered at once with an enthusiastic and emphatic "Yes!"

"Then I shall start my story by telling you how alcohol affects the ability to swim. No experiments have been made on higher animals, but there are many tests on one-celled forms. They tell how alcohol affects the cell.

"If you will cut an orange, you can see the cells of which it is made. Our bodies are made of cells too, and cells are made of what is known as protoplasm. (*Proto* means first, and *plasm* means form.) The white of an egg is somewhat like protoplasm.

"Before I show you how alcohol affects ability to swim, let me show you its effect on protoplasm. Here is some white of an egg. Cover it with alcohol. It becomes stiff and dry, almost as if it had been cooked. The protoplasm has clotted, or coagulated, as blood does in the air.

"In live cells, protoplasm moves all the time like water in a stream. In alcohol, it ceases to flow, and becomes dry like the white of the egg in the test. In a 15 per cent solution of alcohol, cells die and fall apart.

"Now, let us see how alcohol affects swimming ability. In small pools of water everywhere are found one-celled animals. They are protozoans. (*Proto* means first, and *zoans* means animals.) They swim with hairlike arms called cilia (hairs). To swim well, these hair-arms must move together.

"When these protozoans are put into water in which there is a very little alcohol (½ of 1 per cent) the hair-arms beat the water faster, and for a brief instant they move with greater speed.

"If more alcohol is put into the water (1 per cent) the cilia cease to beat together, and the speed of swimming becomes slower. In water that is 4 per cent alcohol, the little animals cannot move. If promptly put into fresh water, they recover.

"In water that is 5 or 6 per cent alcohol, blisters form on the body, and the cilia drop off. In a little while the body turns hard and yellow. The protozoan is dead.

"Another type of protozoan is attached to rocks and earth by the lower part of its body. Its upper part moves by the action of cilia. These cilia also serve as arms to force food into its gullet. In weak alcohol solutions, the animal loses the power to feed itself, and starves.

"When amoebae are in good health, they travel in straight lines. This is called 'walking.' It results from the animal's sending out part of the body ahead, as when you push inside a pillow. In ½ per cent alcohol, these 'limbs' are also sent out from the sides, and the speed of movement ahead is cut down 20 per cent. In 5 per cent solutions all motion stops.

"Snails also swim. The snail has two sets of nerves. One fixes speed of movement, the other controls direction. When snails are put into weak alcohol

solutions, speed increases, but the arms (cilia) lack control, and do not work together.

"The jellyfish is looked upon as the type of creature without 'spine' and character. It has cells, tissues, organs, and a nervous system. It can swim. A little alcohol (¼ of 1 per cent) makes it struggle to swim faster; a stronger solution slows it down. In 2 per cent solutions the swimming movements are slow and weak.

"All the facts say that alcohol harms swimming ability. The arms and legs (cilia, limbs, et cetera) cannot work together, and the movements are slow and feeble. Let us see how it affects speed, ability, and strength in other kinds of activity.

"Have you ever threaded a needle? Then you know it takes close work between the eyes and the hands. If the eyes do not see clearly or if the hands do not stay steady and move straight, failure results.

"A man tested his own ability to thread needles when sober and when he had taken alcohol. When sober, he could thread 180 needles in 20 minutes. After a small quantity of liquor was taken, his threading rate went down from 6 to 10 per cent.

"Many other tests of muscular *precision* have been made. Precision means control, and, to be precise, the parts of the body have to work closely

together. One of the general studies of eye and hand precision was made by using what was called a 'dotting machine.' A small tape, on which were red and blue circles, was moved past a small opening or window, and, as the circles moved by, the person being tested dotted every red circle with a sharp stylus (a pointed instrument, as the needle on a phonograph) as near the center as possible. For every blue circle he pressed an electric button that made a record on a drum.

"The score was the sum of the distance on the red circles between the dots made by the stylus and the center; the smaller the score, the greater the control. Dotting a blue circle was an error. Alcohol increased errors more than double, and made the precision scores only half as good.

"Typing demands fine adjustments between fingers and hands. Errors are of many kinds: letters in the wrong order, wrong spacing, capitals for small letters, misspellings, weight of touch, et cetera. Speed of writing is also important.

"Dr. Miles found that errors went up 40 per cent after one small drink, and up 70 per cent after a large drink. Speed of typing is only a little more than half as high after a drink of alcohol. One woman made 88 per cent (nearly double) more mistakes

after a drink of alcohol without food. A man made 74 per cent more errors on an adding machine after taking alcohol.

"Here is a letter cancellation test in which you may cross out all the A's, V's, and Y's. Your score is the number you have right.

ACBVADTYRAMSYVANPSRVSWYACDSYA

"In Europe there are cities and countries where children are given wine and beer to drink. In one of these cities, 26 boys and girls 10 years old, and 26 boys and girls 14 years old, who drank wine at home, were tested, using tests of letter cancellation like the one above, and bead-stringing tests.

"After their usual scores were known, they were allowed to drink 10 cubic centimeters (2 teaspoonfuls) of alcohol in raspberry juice, and then were tested again. They lost in scores from 5 to 7 per cent.

"What we know about the world outside our bodies is brought to the brain and nerves through the senses. Sounds reach us through the ears, sight through the eyes, taste through the tongue, touch through the skin, and smell through the nose.

"If your hand touches something hot or sharp, your hand jerks away swiftly; if a hand strikes out toward your eye, your eye closes or 'blinks.' A

sharp sound causes you to jump and turn toward it. You cannot control these movements if you would.

"These quick movements are due to reflexes. In this word, *re* means back, or again, and *flex* means to bend. *Reflex* means to *bend back* or *again.* The cause (light, sound, touch) is a stimulus; the response of the body or part of the body to the stimulus is the *reaction (re* meaning back, or again; *action* meaning movement).

"The interval between the time a stimulus reaches a sense organ and the time the muscle of the sense organ reacts is called the reaction time. A quick reaction time is a good safeguard to the body.

"Think what this means if you are driving a car. Another car appears suddenly ahead. If your reaction is quick, you let up on the throttle and push down on the brake. You may turn your car to one side or call out a warning. The 'split second' of time saved by quick reaction may prevent an accident.

"A quick reflex is of value in many ways. A pitcher throws a fast ball. Your reflex has to be lightning fast to crack it with the bat. In music you react fast with your fingers to the sight of the notes so you may miss none and keep in time.

"A quick reaction means *speed.*

"A sure reaction means *precision.*

"Suppose we try to describe people in terms of *speed* and *precision*. Some are—

1. Quick and sure.
2. Slow and sure.
3. Quick and uncertain (always do the wrong thing or do the right thing wrong).
4. Slow and uncertain.

"We have already seen from studies of needle threading, stringing beads, and typing that alcohol slows down speed and reduces precision. It makes people slow and uncertain. Let us see what the effects are on reaction time alone.

"Alcohol cuts down the speed of the eye blink from 10 to 12 per cent. Larger drinks reduce speed still further.

"The knee jerk is a kind of reflex often used in tests. The insane fail in the knee jerk test. It is given in this way: Cross one knee over the other lightly, and relax the muscles. Lightly strike the top leg just below the kneecap with the edge of your hand. In normal persons the leg will kick out sharply and quickly.

"After a small dose of alcohol is drunk, the speed of the knee jerk slows down 10 per cent. The extent of movement is lowered nearly 50 per cent.

"Other tests have been made: speed of reaction

to a word—where I say a word and you answer with the word it makes you think of—and speed with which a code is put into letters and words. The results two hours after drinking alcohol are brought together in the table below.

Test	Effect
Speed of eye reaction	Slower
Speed of word reaction	Slower
Keenness of sight	Less
Speed of fingers	Slower
Speed of typing	Slower
Speed of code writing	Slower
Number of typing errors	Greater
Clearness of typing	Less

"Very few tests have been made to show how alcohol affects strength. In mountain climbing, Dr. Durig found that one dose of 3½ tablespoonfuls made him take 25 minutes longer on a 7½ hour climb. 'This,' he said, 'was a loss of all the speed and strength I had gained by months of training.'

"Dr. George E. G. Catlin says that alcohol tends to impede the strength and speed of muscular work. This is true of heavy activity such as digging trenches.

"He also says that in the British army in the South African war, on a long hard march, you could tell the drinkers, for 'they dropped out as if they had been labeled.' "

Things to Do

1. Make large charts showing the nature of one-celled plants and animals. Include a few drawings of cells from the human body. (You can find pictures of cells in books on biology and physiology).
2. Collect in a jar some simple forms of plant and animal life. Spirogyra, or pond scum, is an example. Put in a booklet all you can find out about the life of one or two of these forms.
3. Write a short story in which you discuss this question: "If alcohol will hurt one-celled animals, will it be likely to hurt large, many-celled animals?"
4. Make up a cancellation test for the Bulletin Board. See if you can find other kinds of tests in books, magazines, or newspapers.

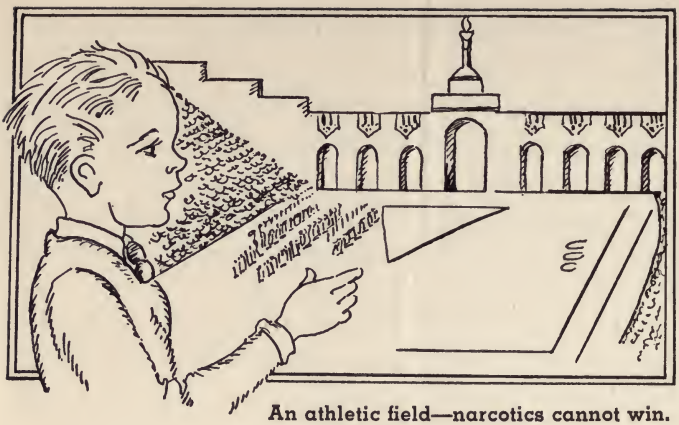
For Review and Test

1. Does alcohol make a one-celled animal swim better?
   How does it affect a protozoan?
2. What is protoplasm? Does it move in a live cell?
   Do the cells of man contain protoplasm?
3. How does alcohol affect protoplasm?
   Does it make it hard?
   Does it stop its movement?
   Will it kill protoplasm?
4. Does alcohol make the movement of protoplasm faster or slower?
   Does it make reaction time faster or slower?

Notes on Books

Dr. Bogen tells how alcohol affects nerve cells in Chapter VII, *"What About Alcohol?"* Mr. Caldwell's book, *"Answers to Alcohol,"* is good on reaction time and learning, pages 17-20; and Dr. Donnelly takes up muscles and senses in Unit IX, *"Alcohol and the Habit-Forming Drugs."* See if you can find other books about alcohol and learning or about alcohol and the muscles.

See also "Alcohol in Youth's World," in *Journal of the National Education Association,* vol. 26, p. 237 (October, 1937).



An athletic field—narcotics cannot win.

FRANK'S STORY

ALCOHOL: *Its Effects on Speed and Strength*

"I KNOW all of you are interested in athletics," said Frank. "I am going to tell you how alcohol affects speed and strength in athletics, and in workers too.

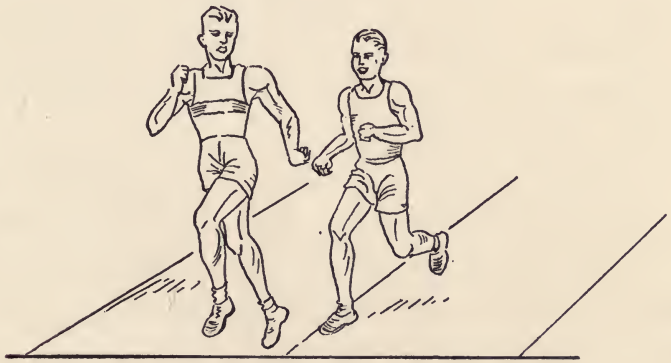
"Athletics require speed and strength, and all coaches and trainers forbid their men to take any alcoholic drink. They think it is time wasted to try to train a man who drinks.

"In the Olympic games, Americans stand at the top. 'At the games in Paris,' said Coach Stagg, 'the

only ones that matched us at all were Finnish athletes, and they do not take liquor. Our men drank nothing but water; and we took our water with us.'

"Have you ever looked over track records? These are the toughest kind of speed tests. Frank Wykoff and Jesse Owens are tied for the world's record in the 100-yard dash. Both of them ran it in 9.4 seconds. If you could cut that speed by 10 per cent, your record would be 8.93. One of the reasons why that record is hard to beat is that these men do not drink.

"Records for the mile run are so close now that they are won by 'split seconds.' Eight years went by (1915-1923) without a change until Paavo Nurmi of Finland took the record away from Norman Taber of the United States.



A split-second finish.

"The table below tells you that the two countries, Finland and the United States, who train their athletes on water, have won the mile record 4 times out of 7; it also shows how close the records are, and what 10 per cent and 'split seconds' mean.

TRACK RECORDS IN THE MILE

Winner and Country	Year	Record	Time Shortened
John P. Jones, U. S. A.	1913	4 min., 14.4 sec.	
Norman Taber, U. S. A.	1915	4 min., 12.6 sec.	1.8 sec.
Paavo Nurmi, Finland	1923	4 min., 10.4 sec.	2.2 sec.
Jules Ladowmegue, France	1931	4 min., 9.2 sec.	1.2 sec.
Jack Lovelock, New Zealand	1933	4 min., 7.6 sec.	1.6 sec.
Glenn Cunningham, U. S. A.	1934	4 min., 6.8 sec.	.8 sec.
Stanley Wooderson, England	1937	4 min., 6.6 sec.	.2 sec.

"Any athlete who drank liquor could never win a world's record, for drink would reduce his strength and skill 20 per cent. Experiments conducted by Dr. Walter R. Miles gave such results. When sugar in a dog's ration was replaced by alcohol, the dog's working ability went down 22 per cent.

"Studies of work have been used to tell whether alcohol is a food. The arm of the subject was clamped to a table, while the forefinger of the right hand pulled a string running over a pulley, thus raising and lowering a heavy weight.

"The 'pull' was repeated 12 times, then a rest of

one minute was allowed, and then the weight was lifted another 12 times. A record of the distance the weight was raised was kept on a revolving drum. The distance in meters times the weight raised in kilograms was the measure of 'work.'

"This table gives the results for 12 days when—

1. No food was taken.
2. When food was taken.
3. When alcohol was taken.

"For the first five days of the test, alcohol rated 1/1000 of 1 per cent better than 'no food;' for the last seven days 'no food' was 4.6 per cent better than alcohol. Food increased the ability to work 6.4 per cent.

ALCOHOL AND WORK*

Periods	No Food	Food	Alcohol
12	41.004	43.622	41.322
First 5	20.858	22.373	22.100
Last 7	20.146	21.249	19.222

"In another test, food without alcohol was matched against food with alcohol. For 12 days, food gave 8 per cent more work than food with alcohol.

"Persons who have to watch out for the safety of others should never use alcohol, says Dr. Emer-

*In this test it is demonstrated that there is no food value in alcohol.

son (*"Alcohol, Its Effects on Man,"* page 101). Such persons as locomotive engineers, firemen, policemen, doctors, nurses, and lifeguards should avoid it in all forms.

"The Class A railroads have a rule against the use of alcohol by their workers. This rule also says that men who go to places where alcoholic drinks are sold will be dismissed.

"In aviation the license of any pilot will be revoked for his 'using liquor, or having it in his possession, while on duty.' This same rule applies to cocaine and other drugs.

"Suppose you say, This may be true of whisky and strong drinks; but is it true of light wines and beer? Doesn't beer rest a worker when he is tired?

"The answer to both questions is, 'No!'

"Dr. Walter R. Miles says that there is no longer any room to doubt the harmful effects of weak drinks (2.75 per cent by weight). If 27½ grams (about 2 tablespoonfuls) are taken, the effects are about the same as when 21 to 28 grams of strong liquor are taken (14 to 22 per cent).

"And this is the reason: Alcohol is thrown out of the body very slowly (10 cubic centimeters an hour). If more is taken in than can be burned up or thrown out, it remains in the tissues and blood.

Milk costs less than beer. Its food value is twenty times as great.

Ten cubic centimeters are only two teaspoonfuls. A glass of 4 per cent beer (½ pint) contains enough alcohol to lower working ability for two hours, without counting aftereffects.

"Beer is more than fermented barley malt. It contains a light oil from hops. This oil is made up of several *terpenes*, which are like turpentine. They give beer a bitter taste, and help to keep it from 'spoiling.'

"The hop plant belongs to the hemp family. On its blossoms (the parts used in beer) are small glands. They form a bitter, sticky narcotic, which is the same as hashish, or marihuana. (See page 97.)

"Many workers say that a glass of beer makes them feel better when they are tired, and gives them strength for more work. Is this true?

"The answer is, 'No!' Beer has very little food

value, and what little it has is due to salt and sugar. The food value of a glass of milk is more than twenty times the food value of the same amount of beer.

"Then why do workmen say beer helps them?

"There are two reasons:

"First, workmen rest while drinking beer. While they are resting, the oxygen they breathe burns up waste matters, and sugar comes from the cells of the body into the blood. This sugar is ready to use in work.

"You know how fast you breathe after running. You know how much a rest helps you. The rest a workman gets while drinking a glass of beer is what makes him stronger—not the beer."

"Would it be as well to drink water?" asked Miss Lane.

"The workman would have the same rest while drinking water.

"Some men who work in mines and in great heat say that if they drink water on leaving work they may have cramps and feel sick.

"On hot days and at hard work, men sweat a great deal. They lose water in sweat, and they also lose salt. One reason they feel tired is that the salt supply is used up. Heavy drinks of water dilute

the salt in the blood still more, and may bring on cramps.

"Beer, to some persons, may seem better than water because it has salt in it.

"Now many companies who employ men to work under the hot sun, in hot mines, and by hot furnaces, give them a few salt tablets to take with their drinking water.

"They give their men water in which salt has been dissolved. These salted drinks are better and cheaper than beer."

"But is not alcohol good in cold countries to keep one warm?" asked Miss Lane again.

"A great arctic explorer, Dr. Nansen, says: 'I take a stand against alcohol and the use of all narcotics in cold climates. One who drinks alcohol runs a bigger risk of death by freezing.'

"There is nothing in the world that will keep you cool in a hot climate and also keep you warm in a cold climate.

"Why does alcohol make you feel warm?

"It acts on the nerves that control the blood vessels of the skin, and there is a rush of warm blood to the surface. It brings the blood out where it will be cooled more quickly, and more food is called for to keep up the heat.

"After the warm flush is over, the drinker feels cooler. The fact is, his bodily temperature has not been changed. If you should test him with a thermometer, you would find it will read 98.6° F., or his normal rate.

"Alcohol has fooled him again.

"Dr. George E. G. Catlin says: 'The warm blood has been sent to the skin, where, if it is chilled, it cools the whole body. . . . Alcohol is not only useless to keep you warm; it is dangerous. Good food, sound digestion, and exercise are the best sources of bodily heat.'

"This is the end of my story," said John. "My facts tell you that alcohol lowers strength and skill. The athlete, the worker, and the explorer make better records without it. It slows down the speed of nerves and muscles, and makes the user unsteady and careless.

"Mary will now tell you about alcohol and disease."

Things to Do

1. Find the world's records in some of your favorite sports, and post these records where others may read them.
2. Cut out pictures of athletes and famous players from the sports page, and put them on the Bulletin Board.
3. Make up or find a list of "training" rules for athletes and workers.

4. Make a booklet about the Olympic games.
5. Discuss with others why one should keep himself in "top form."
6. Make a map of Europe, and show on it in colors the chief wine, beer or ale, and whisky countries. Find how each ranks in athletics, and show on the map. (The *"World Almanac"* has these records.)
7. Write all the reasons you can think of why athletes do not drink alcoholic liquors. Post your list on the Bulletin Board.

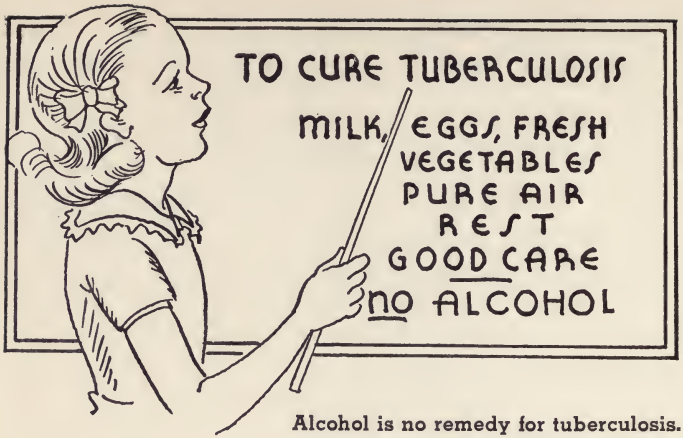
For Review and Test

1. Is there much difference in the time made by the fastest runners? Would the use of even a little alcohol affect a runner's speed?
2. Which is better for a worker—to take *food* or to take *alcohol?*
3. Why are policemen, aviators, and engineers told not to take any alcoholic drink?
4. Are there any good reasons for classing the driver of an automobile with an aviator and an engineer?
   Should he drive while under the influence of alcohol?
   Why or why not?

Notes on Books

The little book, *"Youth Studies Alcohol,"* by Harkness and Fort, gives the answer to the question "What About Athletics?" pages 90-99; pages 28-30 in Caldwell's *"Answers to Alcohol"* are also good. Nearly every textbook in physiology and hygiene gives the main facts on alcohol and athletics.

See also, "You Shall Decide," in *Scholastic,* vol. 32, pp. 5, 6 (April 23, 1938).



Alcohol is no remedy for tuberculosis.

MARY'S STORY

ALCOHOL: *Its Effects on Health and the Life Span. Does alcohol injure the health? Will it cause disease? Is it good for people who have been hurt or poisoned?*

"A FEW days ago," said Mary, "I was at the home of a friend. Her father came home from work early. He was sneezing, and said he had a headache. 'I am taking a cold,' he said.

" 'Let me fix you a hot drink of whisky,' said my friend's mother.

"Was this a good remedy?

"Long ago, doctors gave liquor to persons who

had tuberculosis. The remedy was to give them a case of whisky and send them off to some mountain resort. Few came back. Says Dr. John S. Billings: 'The course of tuberculosis in drinkers is often more rapid than in others.'

"Modern doctors do not give any alcoholic drink for tuberculosis. They prescribe good food—eggs, milk, fresh vegetables; rest; clean, pure air; sunshine; and good care. The number of cases of tuberculosis and the death rate from it are today less than half what they were thirty years ago.

"Tuberculosis, scarlet fever, pneumonia, cholera, and many other diseases are caused by germs. Germs are small forms of life, which, like yeast, can break down compounds—sugar, proteins, and starch.

"An army of white blood cells is always on guard against these germ enemies. Each cell is somewhat like an amoeba. It sends out parts of its body and enfolds the enemy germs, and makes a dinner of them.

"Remember, too, that soon after alcohol reaches the stomach, it goes into the blood. Its effect is to benumb the white corpuscles. They cease to stand guard against germs. These enemies grow and multiply in number, and bring on the disease.

"Speaking of pneumonia and alcohol, Dr. Irving Fisher quotes Dr. S. W. Lambert: 'I found alcoholics

more prone to the disease. . . . You were lucky if you saved 10 to 15 per cent of the alcoholic patients.'

"Drinkers are careless about spreading germs. In the sputum (spit) of tuberculosis patients are millions of germs. These dry into dust, and float in the air. They are breathed by well persons, who may take the disease.

"Of typhoid, Dr. Lambert found that his patients did better, he had a lower death rate, fewer had injuries to the bowels, and fewer had bleeding when he gave up prescribing alcohol.

"The air that is *breathed out* of the lungs of tuberculosis patients may not have germs in it. The air that is *coughed out* swarms with disease bacteria. Very often the germs that are breathed in lodge in the throat, and start the disease. Alcoholics who have tuberculosis expose others; the air passages of other alcoholics are more likely to be attacked.

"Persons who drink are more likely to expose themselves to germs in dark, dirty drink shops. Poverty, overcrowding, dusty work, all lead to the spread of this disease.

"In a new book, Dr. George E. G. Catlin says: 'Tuberculosis occurs among 35 per cent of alcoholics.' Among nondrinkers it occurs in 20 per cent or less of the total.

" 'Scourges of today,' Dr. Catlin says, 'dust, bad ventilation, long hours, drunkenness, all render a person more likely to have the disease.'

"Years ago, a drink of brandy was often given in the case of shock and fainting. Now doctors think it too great a risk to give any alcohol for shock (as in an automobile accident). It may help to cause death.

"Alcohol was also given for snakebite and for poisoning by spiders and other insects. Snake poison is a toxin. Alcohol toxin spreads snake poison quickly throughout the whole body. Many persons have been killed by alcohol given for snakebite and insect bites. The old idea was to fill up the patient with alcohol.

"Dr. Emil Bogen says that persons bitten by harmless snakes have been killed by the alcohol treatment given them.

"Five ounces of alcohol taken at one time have been known to cause death.

"The idea that beer is good food is out of date; but now and then, thin and poorly nourished persons are told, 'Drink beer for your health.' Often they *do* fatten up. This is because they develop a disorder called *obesity*.

"*Obesity* means excess of fat. The most dangerous places for 'beer fat' to appear are in the heart

and the liver. It also piles up on the stomach, intestines, and hips. Women who want to keep 'that girlish figure,' to be slim, quick, and graceful, should not become drinkers of beer, wine, or distilled liquor of any kind.

Beer is a fattener.

" 'Beer fat' is soft and without form. The arms and legs look bloated. The eyes become red, and little pouches form beneath them. The cheeks sag, and double chins are the rule. The skin is dull and coarse. Overuse of alcohol, especially of wine and beer, is one of the reasons why the women of Europe lack the good looks and the trim figure of American women.

"Girls and women who drink beer do not stay slender. The 'wienie' shape or 'balloon' figure of

drinkers can be produced in a few months. Old age grins in the beer bottle; 'a woman of thirty, looks like sixty.'

"Persons who take narcotics because they crave them are known as addicts. This is a Latin word in which *ad* means to, and *dict* means say. An addict is like one who has pledged his word to a drug, to obey it and live for it as men of long ago obeyed a king.

"To be an addict is to have a kind of disease. An addict to alcohol is called an *alcoholic,* or a drunkard. His disease is *alcoholism,* or *drunkenness.*

"A person who has to have alcohol every day is a *chronic drinker,* or toper. A person who goes without alcohol for many days or weeks and then goes on a 'spree' or has a long spell of drunkenness is a *dipsomaniac.* This means *one who is made mad by drink.*

"A person who has taken many drinks of alcohol and been on a 'spree' goes 'out of his head,' as we say. He has delirium, much as a sick man has when he has a high fever.

"A drunken man's delirium is different from that caused by a fever, however. His muscles tremble, as if he were scared. That is the reason why this trembling madness is called *delirium tremens.*

"In this insane state, he sees snakes, lizards, spiders, rats, and terrible demons. He hears voices that warn and threaten of danger. He is in a state of excitement and fear, in which he may kill himself or someone else. This delirium may last for days. The trembling lasts after the horrid nightmare is gone.

"This is the way a man described his madness.

" 'Awful faces appeared on the wall and the ceiling. Foul things crept along the bedclothes, and wild eyes peered into mine. I was at one time covered by spiders that crawled slowly, slowly over me.'

"Epilepsy, which used to be known as 'falling sickness,' may be caused partly by alcohol. The common name of this ailment is fits. 'The drinking of alcohol,' writes Dr. C. C. Weeks, 'often leads to storms of muscular activity, and forms of epileptic attacks are frequent.'

"A disease that doctors have learned about of late years is alcoholic polyneuritis. In this word *poly* means many, *neur* means nerves, and *itis* means inflammation. Thus polyneuritis is a complicated disease of the nerves.

"It causes pains and aches in the arms and legs, swelling of the joints, and weak muscles. The memory is very poor, and the sufferer draws out of his dis-

ordered mind wild tales of things that never happened. It is like malnutrition, which comes from lack of vitamin B. It is true that drinkers are often careless about their food, and may be undernourished.

"It is hard to tell how many persons die from alcohol poisoning. Reports of deaths give the total as 1 per 100,000 of the population. Indirectly it causes many more, for it often goes along with murder, suicide, accidents, and liver disease.

" 'Alcohol is a related cause two or three times as often as it is a direct cause,' writes Dr. Catlin.

"Some doctors say that the liver disorder known as cirrhosis (hobnail liver) is alcoholic in origin. Others deny it. The death rate from cirrhosis is from 7 to 10 per cent. Catlin is of the view that the true death rate from alcohol is nine times the death rate from cirrhosis, or about the same as for cancer.

"Dr. Irving Fisher quotes Dr. Oscar H. Rogers of the New York Life Insurance Company as saying that the death rate of its members who do not drink is less than the death rate of its moderate drinkers.

"In 1920, when the people of England were in a struggle over liquor, a poster was put out that said: 'Drink is one cause of not less than 60,000 deaths every year in the United Kingdom. Every 8 minutes someone dies from the effects of alcohol.'

"Again, it has often been said that 'every glass of beer shortens a man's life by 25 minutes.' Both of these statements may be somewhat exaggerated, nevertheless it is true that those who do not drink may expect to live longer than those who do.

"Among life insurance companies, the actual number of deaths among drinkers is close to 90 per cent of the 'expected' number. Of those who get life insurance, the chances for a nondrinker's outliving a drinker are about 125 to 100. Therefore some writers say a nondrinker has a chance of outliving a drinker 10 or 12 years. At the most, this would be true of those who can pass the examination for life insurance.

"Men and women who make and sell liquor are not as good risks as other workers. In England, for every 5½ deaths among nondrinkers there were 10 among drinkers and 16 or 17 among tavernkeepers.

"The extra risks run by liquor workers are:

1. Homicide (murder)
2. Suicide
3. Alcoholism (and delirium tremens)
4. Accident
5. Tuberculosis
6. Cirrhosis of the liver
7. Heart disease
8. Apoplexy
9. Insanity
10. Pneumonia
11. Catarrh of stomach
12. Pellagra
13. Polyneuritis
14. Paralysis
15. Epilepsy
16. Gout
17. Rheumatism

"You may know some very old man who uses alcohol and who boasts that he has used it all his life. There are a few such persons; but their long lives have been due to their ability to stand the effects, not because they live longer for having used it.

" 'Those who don't drink don't die so fast,' is a law no one can dispute.

"It again comes back to the fact that alcoholic drinks are not like water and milk. *Pure* water or *pure* milk will not poison you, but *pure* alcohol is one of the worst poisons in the world.

"Do you know what an *antidote* is? An antidote is anything that offsets the effect of a poison. You have never seen an antidote offered for milk or water poisoning, have you?

"The reason is, they are not poisons!

"Alcohol is a real poison; and here is the treatment for it:

"Induce vomiting or use the stomach pump. Give hot coffee or ½ teaspoonful of aromatic spirits of ammonia in a glass of water. Keep the patient quiet, *wrap him up warm*, and put him to bed. Artificial respiration may be necessary.

"Is it a surprise to you to know that alcohol injures the health?

"Dogs that are fed alcohol are not as strong and lively as other dogs.

"Dr. C. F. Hodge had four cocker spaniels. He fed alcohol to Bum and Tipsy. They were the stronger pair.

Dogs that are fed alcohol feel too tired to play.

"He called the other two dogs Nig and Topsy.

"Bum and Tipsy were given alcohol every day. They did not like it. It had to be put into their stomachs with a pump.

"Both of them were very sick with distemper. They lost flesh, grew weak, and, for a while, were blind. When alcohol was taken away, they became well. Nig and Topsy were not ill at all.

"If a stranger came into the kennel, the normal dogs would run up to make friends. The alcoholic dogs would run away.

" 'Whistles and bells never failed to throw Bum and Tipsy into a panic,' said Dr. Hodge. They howled

and yelped, while the normal dogs simply barked.

"Fear like this is a result of poisoning by alcohol. It is what occurs in delirium tremens.

"Tipsy's puppies also suffered from alcohol given to her. In one litter of seven, two were born dead, and two were harelipped.

"In the second litter of seven, two were born dead, three were deformed, and the others were helpless. The next litter of six had two born dead, three deformed; all the puppies born alive were helpless and soon died.

"Bum and Tipsy and Nig and Topsy were tried out in a ball test to see which were stronger. In the gymnasium, a rubber ball was thrown 100 feet. A record was kept of the dogs that ran for the ball and that brought it back. One hundred ball throws made a test, and each test took 50 minutes.

"In tests over fourteen days (1,400 balls) Nig and Topsy returned 922 balls, or 66 per cent. Bum and Tipsy returned 478 balls, or 34 per cent.

"Bum and Tipsy were only 60 per cent as active as Nig and Topsy. Bum was 32 per cent as active as Nig.

"Nig returned about the same number of balls he started for. Bum grew tired quickly, and was not as quick as Nig.

"After a while, Bum went blind, and alcohol was kept out of his food. His sight came back, and at the end of three years, his ball tests were 95 per cent as good as Nig's.

"The last year of his life was marked by bad health. He took some skin disease, and large areas of skin peeled off. He also began to lose his sight, and finally became wholly blind.

"Alcohol is not good for either dogs or men.

"My story shows that alcohol causes sickness. It will not cure snakebites. It adds to the death rate. It is a dangerous poison."

"In our study of narcotics," said Miss Lane, "Jerry has told us where alcohol comes from and what it is useful for; Harry has told us how it affects growth; John has given us the facts on alcohol and work; and Mary has given us the story of alcohol and disease.

"We have arrived at several definite truths, which I shall write on the board for you:

TRUTHS ABOUT ALCOHOL

1. Alcohol is a narcotic poison made by yeast plants.
2. It is very useful in industry.
3. It is not a growth food, but keeps down growth in plants and animals.

4. It reduces speed, control, and strength, and harms the worker, the athlete, and the student.
5. It causes definite disorders and ailments, and raises the death rate.

"We are now ready to study another narcotic, one that goes back in history as far as alcohol. Betty will tell us about opium and its effects."

Things to Do

1. Make a booklet on "the common cold," telling what causes it, how it is spread, and simple things to do to prevent it and help the person who has it. Are alcoholic drinks of any value in curing colds?
2. Make a cartoon of the "old-fashioned doctor" giving alcohol to his patients, or show in some other way the modern view of alcohol as a remedy for tuberculosis, pneumonia, or snakebite.
3. Draw a clock to illustrate the fact that in England someone dies every eight minutes from the effects of alcohol.
4. Write as many slogans as you can on the effect of alcohol on health. Here is an example:
   "Make your drinks shorter and you will live longer."
   Put the best on the Bulletin Board.
5. Draw a cartoon to show how sickness and death are the result of the buying of alcoholic drinks.

For Review and Test

1. Is alcohol given to persons who faint or are shocked?
2. What is the proper way to treat snakebite?
3. How does beer drinking affect weight?
4. What is an addict?
5. How would you help a person who has been poisoned by alcohol?
6. What was the worst effect of alcohol on Bum, the cocker spaniel?

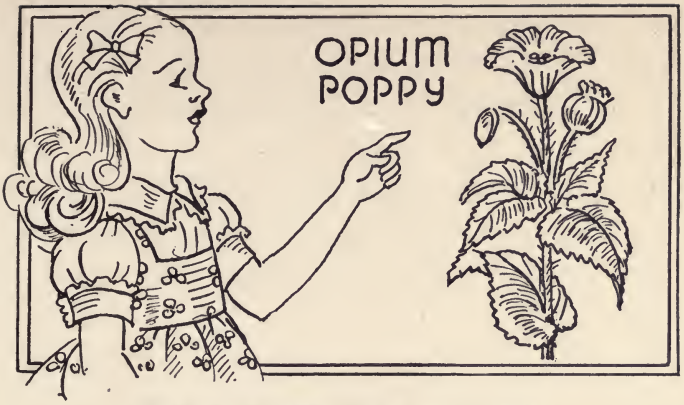
Notes on Books

Dr. Bogen has three chapters that relate to health. See *"What About Alcohol?"* pages 69-78.

Mr. Caldwell tells you about alcohol and snakebite in *"Answers to Alcohol,"* page 11.

In *"Alcohol and the Habit-Forming Drugs,"* Dr. Donnelly writes interestingly of "Alcohol in the Treatment of Disease," pages 43-56; and of "How Long We Live," pages 161-170.

See also "Alcohol and Narcotic Drugs," *The Journal of the National Education Association,* vol. 26, pages 181, 182 (September, 1937).



"The demon flower"—the opium poppy.

BETTY'S STORY

OPIUM: *Where It Comes From and What It Does*

"OPIUM is a narcotic drug. It has been known for several thousands of years. Long ago, great caravans came from India and China to seaport towns of western Asia. They carried silk, jewels, perfume, spices, and drugs. Of all the drugs, none was as important as opium.

"At the seaport cities, Arab traders loaded their caravan goods on ships, and sent them to Greece and Rome. Portugal sent ships around Africa to gather spices, silks, pearls, and opium. In this way opium

came to Spain, France, and England. The Arabs not only spread the drug habit among men, but gave opium to their horses to dull their fears on going into battle.

"In China, the poppy from which opium comes has been known as 'the demon flower.' The blossoms are pure white or various shades of color—pink, deep reds, and purple.

"In the late summer, after most of the flower petals have dropped off and the seed pods, or capsules, are full, green, and hard, workers go into the poppy fields and with small lancelike knives cut shallow slits in the pods.

"From these little slits flows out a dark, sticky juice that forms into scales and drops of soft wax or gum.

"As soon as all the wax has been drained from the pods, it is stripped off and pressed into balls of a pound or two in weight, often with petals and leaves mixed in. The balls are packed in chests for shipment to cities and to foreign countries.

"This is raw opium. It is rolled into tiny pills and eaten, being often mixed with soap cake. The resinous gum is also 'smoked' in special kinds of pipes, and people sometimes really 'smoke' it with tobacco. In form for 'smoking' it looks like thick molasses.

"In bloom, the poppy fields look like gardens, thousands of acres of color or pure white, on the rich level lands that are needed to grow food for the underfed millions of India, Persia, and China.

"From 15,000 to 20,000 tons of raw opium are grown every year. This is enough to load 7,500 to 10,000 trucks, which would make a caravan 30 to 40 miles long.

"Three hundred fifty tons, or 175 truck loads, would make more than enough to supply the whole world with all the opium needed for medicines and anesthetics.

"Raw opium is taken as a drug mainly by country people in India and China. Its demand in Western countries has grown because from it are made twin drugs of great power—morphine and heroin (hĕr'o-in).

"Morphine was made by a German chemist more than a hundred years ago. He named it for Morpheus, the Greek god of sleep. It is usually sold in tablets; but it is used often in liquid form by addicts, who shoot the drug into their veins with a hypodermic syringe.

"Heroin is a white tasteless powder, of stronger narcotic power than morphine. It has been taken like snuff, being sniffed up the nose.

"Heroin is an outlaw in America. It is against the law to bring it in, make it, or sell it.

"Lau'da-num in a deadly poison of opium and alcohol. Par'e-gor-ic is also a poison, but in small amounts it is sometimes given to children in 'soothing sirup' to quiet them and put them to sleep. In this way, babies may get a craving for the drug; but, if treated in time, they may be cured.

"About two hundred years ago, the Chinese on the island of Formosa were taught to use tobacco. They mixed opium with it. About fifty years later, they began to smoke opium alone.

"One hundred years ago, opium was brought to the United States by Chinese coolies. The story is told that a tramp was the first American who ever smoked opium.

"Opium and all its products—morphine, heroin, laudanum, and paregoric—are powerful poisons. Two to four grains of opium are enough to cause death. One-sixth to one-half grain of morphine is fatal.

"Opium (usually as morphine) is useful as an anesthetic, a word whose meaning you should understand. It is from the Greek language. *An* means not; and *aisthēsis* means feeling. Thus the simple meaning is *without feeling.*

"An anesthetic is a narcotic drug that shuts off pain from the brain. Feelings of pain cause shock, and if they last a long time they result in weakness.

"The pain from a wound, a broken bone, or an operation is very severe. To ease it, and the shock that comes from pain, doctors may give some form of opium. A mild dose is a sedative and induces sleep. An anesthetic brings complete loss of feeling.

"Sometimes the anesthetic is given at the source of the pain. This is called a *local* anesthetic. A dentist often uses a local anesthetic when he is working on your teeth.

"A few old-time doctors give opium as a remedy; but most modern doctors say it cannot cure anything. The risk that the 'habit' will be formed is so great that few doctors prescribe it except as an anesthetic.

"Since all forms of opium dull the feelings, no one can expect to feel well after a dose of it. The addict cannot think clearly, is slow and stupid, and does not want to exert himself. An anesthetic does not even end the pain itself. It narcotizes nerve tissue so that the fibers cannot carry the messages of pain to the brain.

"One writer says that the use of narcotics is the approach of living death. It comes slowly with opium, fast with morphine, and at race speed with heroin.

"All narcotics weaken the body and the mind. The addict is like a slave who has to wait hand and foot upon his master. He is bound to him by ties stronger than chains.

"A drinker of alcohol may now and then be sober; but an opium addict must be under the effect of the drug all the time or he is in torment.

"The habit, as it is called, is formed quickly. Many people, the young especially, may become slaves in ten days. A few develop the craving after having 'sniffed' heroin four or five times. Anyone who takes an opium product daily for three to five weeks is almost sure to become an addict.

"The Chinese, who have had a long history of contact with opium, describe its effects in a list of ten 'cannots.'

"An opium addict, they say, *cannot*—

1. Enjoy food and sleep
2. Enjoy wealth
3. Do any kind of work
4. Walk and play
5. Plan anything
6. Help his family
7. Buy on credit
8. Be cured if sick
9. Wait his turn to smoke
10. Give up the habit

"Opium does not show its effects as plainly as alcohol does; but they are there just the same. Men become heavy and stupid under its use, and slowly pass off into a deep, swinish sleep.

"It kills good looks and liveliness; the eyes lose their sparkle; the shoulders and back are stooped; the walk is slow and listless; in a little while the skin becomes dull and mottled—plain signs for everybody to read.

"While under opium, an addict remembers nothing. He may even forget his name and address. He cannot center his attention long enough to add up a column of figures; and he could not give you the multiplication table through the nines.

"Lack of strength in his muscles keeps him from doing hard work. He has no 'drive,' and does not try to get ahead. An easy job with no call for strength or speed and with someone to tell him what to do and to see that he does it is the only one he can hold.

"In India, 75 to 90 per cent of the children under 2 or 3 years are given opium. This is done because the mother has to go out to work, and wishes the child to sleep; because the child is sick or lacks sufficient food; or simply because the mothers believe it is good for babies, keeps them warm, and makes them grow strong.

"The mothers do not know its bad effects; an opium-fed child is a prey to other diseases. The frame is stunted, and the drug causes, in part, the high infant death rate.

"The majority who acquire the drug habit do so in early youth. One third are under 20; one half are under 25. Older persons know the danger of taking a pinch of white powder at a party; they are not willing 'to try anything once.'

"Almost everyone who talks and writes about narcotics mentions the narcotic 'habit.' They say, 'He has the liquor *habit*,' or 'He has the morphine *habit*.'

"The same act done over and over again in the same way is a habit. A habit is *acquired* by practice. A good habit results in good. It does not harm you or anyone else.

"We are said to be *bundles of habits*, for most of our acts are done over and over in the same way.

"A skillful person acts in the best way. A good baseball pitcher holds the ball just right to throw an out curve. A skillful musician learns to strike the right keys at the right time and in the right order, and with just the right touch.

"There are habits of dress, habits of eating, and habits of speech.

"The most intelligent persons are those who have the most good habits and the fewest bad habits.

"Most bad habits are signs that there is something wrong. They may mean one has failed to grow.

"Sucking the thumb, even when a baby, may mean that the gums are sore or that one is hungry or ill.

"Biting the fingernails may mean that one needs better food.

"Using slang may mean that, like a baby, one needs a knowledge of grown-up words.

"Bad habits may mean that one does not know they are bad; or that he does not know how to learn good habits.

"To use opium or any narcotic is to have a bad habit. It is a sign that something is wrong—failure to grow, sickness, hunger, weakness, dullness, or lack of good habits.

"If you have developed a bad habit of striking the keys of a piano, or of smacking your lips or of chewing your tongue, or of holding a baseball bat, you can quit. You do not feel sick or in pain or unhappy when you quit. You just quit and forget it, or you learn a new and better thing to do.

"Addicts to opium, morphine, and heroin cannot quit so easily.

"Once they have said, 'I will be your slave,' it is hard to become free again.

"Why does one man become the slave of another? Because he is weaker than his master. Addicts are weak when they begin; the narcotics they take make

them weaker. When the 'habit' is fixed, they tend to stay drugged forever.

"One who has the morphine habit is thrown into acute distress as soon as the effect of the last dose wears off.

"Without his drug, an addict is jumpy and restless. He yawns and stretches; he sneezes as if he had a cold. His eyes and nose water. His muscles become shaky and trembly and jerky all over his body.

"Dr. C. C. Weeks tells how a morphine addict acts without his drug: He is cold, and, in spite of added clothing, cannot keep warm. He has no taste for food. He feels nauseated, and vomits. He breaks out into a sweat. He has cramps in his abdomen, and cramps in the muscles of his legs and knees.

"He becomes very weak, and, in severe cases, death may follow.

"While in this state of acute craving for the drug, he will do almost anything to get it, except those things that take courage and will power. He will beg, borrow, and steal.

"He seldom breaks into banks, nor does he hold up trains. He is a sneak thief, and picks up anything he can lay his hands on to sell for money to buy drugs. He may become a drug peddler, and if he can

do so, he is sure to get others caught in the trap in which he is fast.

"In the long run, opium develops a disease in the addict, quite like the delirium tremens due to alcohol. An English writer, De Quincey, of a hundred years ago became an addict. He is said to have taken laudanum in alcohol.

"Of its bad effects he wrote: 'I was stared and hooted at by monkeys and parrots. I tried to run away, but was caught by ugly birds and crocodiles. All the things around me seemed alive. The hard eyes of the crocodile leered at me, multiplied a thousand times, and I stood scared and unable to move.'

"Few men who use opium are able to write. They lie like dead men, drowsy and still, or suffer the wild pangs of delirium of which De Quincey tells us."

Things to Do

1. Make up a list of books and newspaper and magazine articles about opium and opium addicts, or cut clippings for a scrapbook.
2. Make a map of the Old World, and show the countries where opium is grown.
3. Find as many patent medicine bottles as you can for the *museum,* and put a skull and crossbones label on those that have contained alcohol or opium. Be careful not to drink out of these bottles; leave the contents alone.

4. Collect plants and seed pods of the American garden and field poppies. Make drawings of the leaves, flowers, and seed pods for the Bulletin Board.
5. Discuss whether or not opium, morphine, and heroin addicts should be sent to jail.
6. Discuss whether or not opium should be grown.

For Review and Test

1. What narcotic drugs are made from opium?
2. How do babies become morphine or opium addicts?
3. What are the chief effects of opium drugs on the user?
4. How do you explain the use of "habit," as when we say, "He has the opium habit"?
5. Does opium result in delirium tremens?

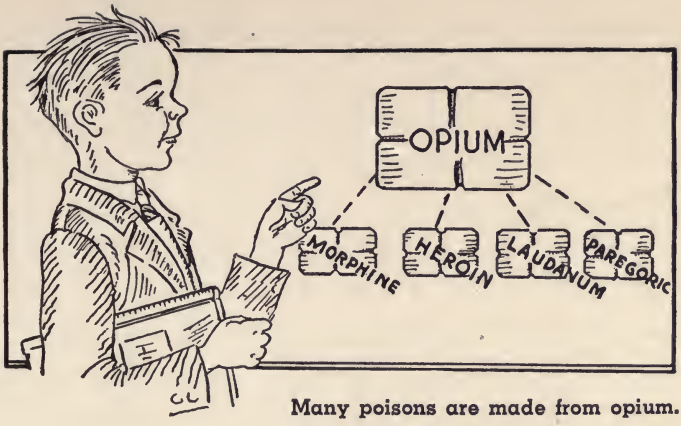
Notes on Books

If you will look in Unit XV in *"Alcohol and the Habit-Forming Drugs,"* you will find a good story about opium and morphine, and a picture of a Chinese smoking an opium pipe.

Sarah Mulhall has a grown-up book, *"The Demon Flower."*

Two books, *"Plain Facts"* and *"Science Speaks,"* are for the big boys and girls in the high school; but if you are a good reader, they will not be too hard for you. See the Table of Contents in each book.

In the magazines, see "Doping the Chinese," in *Current History,* vol. 46, pp. 89, 90 (September, 1937), and "Opium on Wings," in *Literary Digest,* vol. 124, p. 29 (Nov. 13, 1937).



Many poisons are made from opium.

DAN'S STORY

Opium and Opium Drugs

"I SHALL go on with the story of opium," said Dan, "and shall first give you a few 'life studies' of opium users as told by themselves. They tell how the addicts begin and what happens to them.

"CASE 1. 'I began to smoke opium for the excitement. I have tried many times to break the "habit," but whenever I get blue, I go back to it.'

"CASE 2. 'I began to use morphine to get a thrill. I thought I could quit at any time. Now I am a slave. I steal to get money to pay the peddler. It costs me ten dollars a day.'

"CASE 3. 'I was hurt in an auto accident, and was taken to a hospital. There I was given morphine in my arm to quiet the pain of a broken bone and bruised, torn muscles. When I got out, I kept on with the drug.'

"CASE 4. 'My father was a hard drinker, and I left home to "bum" when I was sixteen or seventeen years old. A stranger gave me heroin, saying it was medicine that would make me feel well. It made me very sick, but the next day I took it again.

" 'In a few weeks I had the "habit," and began to steal clothes and radios from parked cars to pay the peddler who had given me my first dose. I have often been arrested for stealing, but I make most of my money that way.'

"Many studies have been made to find out why people use drugs like opium. The people of China and India get the habit while they are young. They are not aware of the bad effects.

"In Europe and America, some old-fashioned doctors give opium because they think it is a remedy. Nurses often give it in hospitals to quiet pain. A few doctors give it in order to make money out of it.

"Many persons get started by bad company, for it is a strange fact that an addict to any narcotic tries to lead others into the habit.

"Users of one drug may take up another if they cannot get the first drug. Opium addicts often turn to alcohol or to cocaine or to both. From alcohol to opium or morphine is only a short step.

"Once in a while you hear of workers' being given opium to ease their feeling of fatigue. This has been

Beware of patent medicines.

done in the fisheries where the hours were long and men were exposed to cold and wet winds.

"The worst story is of persons taking bad drugs and becoming addicted to them without knowing it. This is done through the use of patent medicines.

"A patent is the right given to an inventor to make and sell his invention. It gives him this right for seventeen years. During this period of time,

others cannot make and sell his invention unless he allows them to do so.

"When men discover a new remedy, some of them like to get a patent on it. They try to make money out of it while they have the sole right to make and sell it.

"Most medicines that claim to be patented are not patented at all. They are not new, and they will not cure anything. The makers say they are patented to make people think they are new and useful remedies.

"In this way they fool people into wasting their money on needless and dangerous drugs.

"When you go to a doctor, he writes a prescription for you. He is a trained person, who has a *license* (permit) to practice medicine. You take the prescription to a drugstore where a *pharmacist* prepares the medicine for you. He, also, is a trained person, who has a license to practice pharmacy.

"Moreover, a doctor's prescription is usually written and filled for one person, and for one only. The doctor does not think it is good for everyone at every time he thinks he needs it. The doctor does not claim it will be a cure.

"Patent medicines are not prescriptions at all. If you could trust the claims made for them, they

are for everyone and for almost all diseases. You cannot trust them. They are not made by your doctor for you.

"Many patent medicines contain narcotic drugs.

"Tonics, elixirs, and cordials almost always contain alcohol.

"Soothing sirups, headache tablets and powders, painkillers, cough remedies, and rheumatism cures often contain opium.

"You may become a drug addict through using patent medicines. Soothing sirup may stop the baby's crying, but it may also make the child a drug user.

"The Pure Food and Drugs Act requires the makers of drugs and medicines sold on the open market to print on the label what is in the medicine. Doesn't this law protect you?

"A certain patent medicine, described by the *Journal of the American Medical Association* (Oct. 22, 1927), contained alcohol 20 per cent, horseweed, buckthorn, turkey corn, baking soda, ginger, and a half dozen or so weeds and minerals. Still another patent medicine described in the same magazine (April 9, 1921) claimed to be a tonic and a treatment for disease of the stomach. It contained over 50 per cent water, 40 per cent alcohol, and the remaining 10 per cent no one knows what.

"A third medicine described in the Feb. 7, 1925, issue of this same publication was written of in this manner: 'Each bottle contained 7½ fluid ounces of a brownish-red liquid, having a sharp odor and a taste that was sweet and licorice-like, but afterward mildly bitter. It was said to be made of bark and herbs; but the chief agent besides water was alcohol (18 per cent).'

"The contents of patent medicines as listed in '*Nostrums and Quackery*,' Vol. III, by A. J. Cramp (1936), are: Alcohol, cocaine, opium, morphine, heroin, sodium bromide, chloroform, arsenic, strychnine, carbolic acid, formaldehyde, Luminal, sugar, licorice, borax, soda, potassium, iodide, mullein leaves, saltpeter, anise seed, camphor, wintergreen, turpentine, ammonia, pine tar, creosote, wild cherry, glycerin, sassafras, tartar emetic, quinine, peppermint, linseed, kerosene, cascara, fish oil, yeast, Epsom salts, horsetail, charcoal, and soap in rubs and liniments.

"Some manufacturers do not obey the law.

"Some print the names of the drugs in very small letters; unless your eyes are keen, you cannot read them.

"Some do not put into the bottles what the labels say they do. The contents are changed often to avoid detection.

"Some do not measure carefully. They put in more poison than is shown on the label.

"Patent medicines cure no disease. There is no patent medicine that will *cure* headache, rheumatism, neuritis, liver trouble, tuberculosis, cancer, and heart disease. No patent medicine will grow hair on a bald head or make the skin look like peaches and cream. Besides, an untrained person cannot tell what his ailments are. A trained person has to study a case before he can tell. No one, not even a doctor, can prescribe for himself.

"Persons who want your money may tell you that this medicine was used by the Indians, or that its formula was found in an old book of magic. Usually the story is not true; but, if it were, it would not mean that the medicine is good for you or a remedy for your sickness.

"Very few *remedies* are known to man. A good doctor knows all that are known.

"Why do people take patent medicines?

"Here are some of the reasons:

1. They have been fooled by the label.
2. They think they can tell what is good for themselves.
3. They listen to the advice of a friend.
4. They want the effect of the alcohol or the opium.
5. They like to think they are taking medicine.

"What are good reasons why they should leave all such medicines alone?

"Here are some of the reasons:

1. They are of no value for their needs.
2. They cost too much.
3. They may poison them, make them sick, or kill them.
4. They may give them the drug habit.

"Young persons do not need 'spring tonics,' 'bracers,' nerve quieters, and rest powders. The true medicines for everyone are rest and sleep, good food, and happy, cheerful play in the sunshine.

"These are the remedies prescribed by 'Dr. Quiet, Dr. Merryman, and Dr. Dyet.'

"Can one be *cured* of the drug habit?

"It is very hard to do so. Some men have the will power to quit and to stay quit. They are not many, however.

"A good doctor can usually cure young people under eighteen of the habit.

"When men find they are slaves of drugs, they often ask to be sent to jail to get away from their enemy. Here they also need the care of a doctor. If cut off from drugs at once, they may kill themselves.

"Thirty days, ninety days, go by. The addict is said to be cured. He is set free. Now he must keep

away from alcohol, opium, morphine, and from patent medicines. He must keep away from bad company. If he will help, he may stay cured.

"I have told you about opium," said Dan. "It is a narcotic, which comes from the seed pods of poppies. It may be taken as raw opium by eating or by smoking; it may be taken as morphine, laudanum, paregoric, or heroin.

"It takes only a few days or weeks to form the habit. The habit, once formed, will not let go. It ruins the body and the mind, and unfits the addict for work and study.

"Like an Indian, it often attacks in ambush, especially in medicines or when given by nurses and doctors to relieve pain. It is found in patent medicines. They should never be used.

"Grace will now tell you about cocaine."

Things to Do

1. Collect from newspapers and magazines a "display" of advertisements of patent medicines. Do the advertisers claim their *remedies* will cure? For what ailments are most of the *remedies* advised? Are any of them *cure-alls?*
2. See if you can find advertisements that offer "free samples" of drugs and patent medicines. Make an exhibit of the advertisements on the Bulletin Board. Why are samples given away?

3. Study radio programs for a week, and report any advertising of patent medicines or narcotics. What kind of claims do the radio advertisers make for their products?
4. Collect advertisements of cosmetics, and note their claims. Do they tell you what is in the products?

For Review and Test

1. What is a patent medicine?
   Has it really been patented?
   Why is this claim made?
2. How may the use of patent medicines make one a drug addict?
3. Do patent medicines *cure* diseases and ailments?
4. What are the most common drugs put into patent medicines?
5. How do most drug addicts get started?

Notes on Books

You may refer to *"Alcohol and the Habit-Forming Drugs"* (pages 199-202) for a start on this subject; but some of the best facts are in magazines and schoolbooks. You might tell your father and mother about a book called *"The American Chamber of Horrors,"* which shows how people are poisoned with hair dyes, face lotions, baldness cures, and fat-reducing dopes. In another "grown-up" book, *"Take Care of Yourself,"* Chapter XV gives "The Truth About Painkillers." This book in parts is not too hard for you to read. In the magazines, see "Double Dealers in Dope," in *American Magazine,* vol. 125, pp. 42, 43 (May, 1938).

Cocaine, made from the leaves of the coca plant, is a fearful drug.

GRACE'S STORY

COCAINE: *What It Is and How It Affects Mankind*

"COCAINE is a South American drug. When the first white men reached Peru, they saw the natives chewing the leaves of a shrub, which they called coca.

"The leaves were chewed either green or dry, with the same effect. With the quid was mixed a little powdered lime or ashes.

"In many countries of South America, labor gangs chew the leaves today just as their fathers did before them. They chew them for their intoxicating effect.

"The shrub has been transplanted to the Dutch East Indies. Tons of leaves are shipped from there to Japan and Europe. It grows well in any warm country, and would grow well in California, Florida, Greece, Egypt, and India.

"The dry leaves are packed in cases and shipped to the United States, Japan, Germany, Italy, Switzerland, France, Holland, and England.

"In these countries, a white powder of small shiny crystals, which is a dangerous drug, is made from the leaves. The Germans call it *Koks, weisser Schnee* (white snow), and *Tee.* The French call it *coca, neige* (snow), *poudre de riz* (nose dust), and *blanc* (white).

"We call this white powder cocaine. Addicts know it as 'coke' and 'snow,' and call an addict a 'snowbird' or 'snifter.' Drinks that contain cocaine may be known as coca or cola.

" 'Cocoa' is not the same as cocaine or coca. Cocoa is a drink made from ground cocoa beans. Cocaine is a drug made from coca leaves. There is no cocaine in natural cocoa.

"Chemists have found out how to make cocaine in the laboratory without using coca leaves. This preparation is a mixture of several elements, and is known as synthetic cocaine.

"The poor Indians who chew coca leaves have certain ailments as a result. The poison injures the stomach, and many diseases of digestion occur. Headache and bodily pains follow, and, as the use continues, the addict loses weight, his muscles grow weak and thin, and he is unable to eat and sleep well.

"The poison, cocaine, is far stronger than the coca leaves chewed by the Indians. Five grains is a fatal dose. Children and elderly persons may be killed by a dose of less than a grain.

"Cocaine is taken in several ways. It may be mixed with tobacco and smoked in cigarettes; but, like heroin, it usually is taken by sniffing the powder up the nose. It is very harsh on the soft lining of the nose, and it often destroys the wall between the nostrils.

"Opium soothes the early user, but cocaine produces wild excitement. He talks without any rest, but he cannot listen. He becomes loud and boastful, and feels he is brave enough and strong enough to do anything. In this stage, he may be led into crime. Persons with weak nervous systems may become the helpless tools of men who supply them with cocaine.

"In the next stage, memory, attention, and self-control disappear. The addict cannot focus on one thing strongly enough to answer a simple question.

"In the last stage of intoxication, fits of madness like delirium tremens come on, to be followed by depression and collapse.

"When the dead body of a cocaine addict is dissected, the full effects of the poison are seen. The brain is congested, and there are watery swellings on it. Blood clots are found in the brain and lungs. Other organs show signs of congestion.

"The nerve cells have been broken down, and fat cells have been built up in the blood vessels. The brain injuries explain the madness that is so marked in the last stages of the disease.

"Old-fashioned doctors used to give cocaine for asthma, hay fever, and catarrh. It has been used to deaden pain in dentistry; but, because of its dangers, dentists now avoid its use.

"A morphine addict who cannot get his drug may take up the cocaine habit.

"Its place in medicine and dentistry has been taken by two synthetic drugs—eucaine and novocain.

"Cocaine does not appear in many patent medicines. It has been found in so-called asthma and hay-fever cures; though, the truth is, cocaine cannot cure anything.

"Be careful about taking soft drinks that contain coca; they may owe their so-called restful effect

to cocaine. Water, fruit juices, and milk give the best and most lasting 'lift.'

"Makers of coca drinks say they 'merely use coca leaves after the cocaine has been extracted.' Some cocaine always remains in the refuse of the leaves. The drinking of coca drinks has a bad effect upon nerves and muscles, and may make one an addict.

"I have told you the story of cocaine," said Grace. "It comes from the coca shrub, which grows in South America and the Dutch East Indies. From the leaves is made the narcotic drug, cocaine.

"Cocaine, like opium, makes the user an addict. While under its influence, he is excited, suspicious, and given to wild talk. When the effect of the drug has died out, he is cowardly, stupid, and depressed.

"Cocaine acts quickly to break down body cells and to reduce strength and weight. It leads to madness and death. The only *cure* is not to begin and to keep away from addicts and peddlers.

"Next, Joe will tell about marihuana."

Things to Do

1. Read what the encyclopedias say about the coca shrub and cocaine.
2. Prepare a booklet telling about plants that furnish drugs and that enter into world trade.
3. Many persons think they are being "up to date" and "up with the times" when they use narcotic drugs. Is this true? Make posters or booklets, or write essays or slogans, that will show such persons that the drugs they think are up to date go back to savagery.
4. Make a display of "trade names" of drinks and drugs, and see if you can tell where the names came from.
5. On a chart, list the effects of cocaine with the effects of some other narcotic in speed of acquiring the habit, damage to nervous system, strength of habit, effect on morals, relation to crime, et cetera.
6. Show on a map the chief countries that (a) grow coca, (b) that manufacture it, and (c) that use it.

For Review and Test

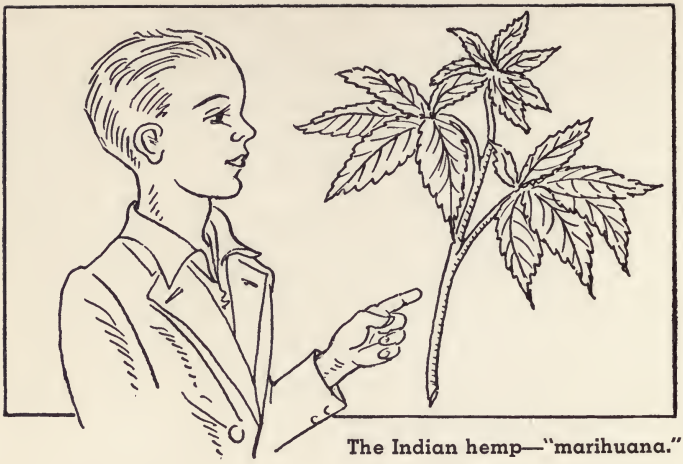
1. Is the use of coca a new habit?
   From whom was it learned by the people of America?
2. Why is it a good thing for us to know what cocaine looks like and how it is peddled?
3. Can people be "fooled" by peddlers and others who want them to get the cocaine habit?
4. How do drug addicts compare with other persons in intelligence, strength, health, and success?
   Are drug addicts "smart" and "up to date"?

Notes on Books

You will not find many books for easy reading on the subject of cocaine. The encyclopedias will tell you about the coca shrub, and schoolbooks in physiology and hygiene tell you the effects of cocaine.

One of the best books on drugs is *"Narcotics and Youth Today,"* by Robert E. Corradini. You should have this book in your library. There are some pictures, and, on the last pages, is a list of drugs and what they are made of, and of many books you may some day wish to see.

See also, "Drug Eaters of the High Andes," in *Travel,* vol. 70, pp. 29-31 (December, 1937).



The Indian hemp—"marihuana."

JOE'S STORY

MARIHUANA: *What It Is and What It Does*

"MARIHUANA is a name given by Mexican Indians to the drug found in Indian hemp. In our own words, marihuana is *Mary Jane.* Marihuana is pronounced like this: ma-re-hwa'na.

"The scientists call marihuana *Cannabis indica* and *Cannabis sativa.* Once in a while you see the name *Cannabis Americana* given to American hemp. These plants seem to be very similar. At least, all belong to the *Cannabis* family, and all contain the active poison marihuana.

"Indian hemp was first known in the Indies, including India proper, Ceylon, Java, and the Philippines. From its coarse, tough fibers or bark were made rope, twine, baskets, mats, hats, and even clothes.

"It was brought to America over two hundred years ago, and planted in Virginia. From Virginia it was taken west to Kentucky, and thence spread over the Middle States and the South.

"It has been planted in the southwest by Mexican laborers, and may be seen growing wild in Colorado, New Mexico, and Arizona. It will grow in all parts of the United States.

"It is a coarse, rough plant, growing from three to fifteen feet high. The stalk is uneven, with many nodes and branches. The leaves are a deep green on top, shaped like a long, sharp arrow, with saw-tooth edges. They are a light green underneath.

"The flowers are small. They grow in thick clusters out of each branch on the female plant. From the flowers there flows a thick dark resin, which falls on the leaves. This is thought to be the drug; but marihuana is also found in the bark and in the leaves.

"In the autumn the criminals who sell marihuana gather the leaves, flowers, and fibers. They dry them and then crush them into a coarse, light-green powder.

"The powder is next rolled into cigarettes for smoking. These cigarettes must be wrapped in two papers, for the sharp ends of leaves and stems cut through. They are uneven in form, and feel rough to the touch.

Modern brigands, like the assassins, use marihuana.

"Marihuana cigarettes are 'peddled' like cocaine, and sell for from 5 to 25 cents each. To start a boy on the 'habit' a cigarette may be given him, and, for beginners, the marihuana may be mixed with tobacco.

"Marihuana cigarettes are known by several names in the underworld, where they are consumed —'muggles' 'reefers' 'hot sticks,' 'motos,' 'Indian hay,' and 'goof-butts.'

"Stories of long ago from Arabia tell about a strange and powerful drug called hashish. 'The Old Man of the Mountain' kept a band of criminals and

killers, who took the drug before starting out on their bloody expeditions. Their drug was hashish; and they were called Hashishi, or assassins.

"This evil drug was marihuana, from Indian hemp. Herodotus, a great writer of Greek history, refers to hashish; it was also known to Homer, the ancient Greek poet, who wrote of the siege of Troy.

"The assassins took hashish in several ways. They made a drink of the leaves and flowers, and they mixed it with honey and with sugar into small cakes or candy.

"The round seeds of hemp are sold for food for birds, and are thought to give to singing birds a thin, high note, and to induce song. Seeds thrown out from feed stores and bird cages often start the plants.

"Hashish comes in the form of a paste composed of resin and the crushed leaves and flowers, which, mixed with sugar and cooked with butter and flavoring, is made into the candy known in Egypt as *manzul*, *maagun*, and *garawish*.

"Hashish is smoked in special hookahs, called gozahs.

"There is no antidote for hashish.

"Present-day addicts are called hashashees.

"No one can foretell what the effect of marihuana may be. This is because it acts in different ways

on different people, and because the strength differs in different plants. One cigarette from a strong plant may make the smoker raving mad.

"The marihuana addict shows three stages of reaction to the drug: Soon after smoking his muscles begin to tremble and his heartbeat runs high. His ears ring, and in his head is a feeling of great heat. Dizziness and cold hands and feet soon appear.

"In the second stage, the world round about has become unreal. The addict thinks he is a great radio singer or an actor, and he tries to 'put on a show.' He laughs like an idiot at the slightest happening. All his worries are gone, and he is in a new, wild world, over which he has complete control.

"One of the queer delusions is the feeling of floating. He loses all sense of time and distance. He thinks he can send his body where he pleases.

"If he is on the fifth floor of a hotel or an apartment, it seems but a step to the ground. He steps out, as he thinks, for a walk in the garden, and lands a broken bundle of bones and flesh on the street below.

"In many other queer ways, he shows the power of this vile drug. He thinks he is as tall as a building; a minute seems as long as a year. His eyesight and his hearing fail, or he sees queer sights and hears strange sounds. His laughter turns to weeping.

"Imagine a person in this stage at the wheel of an automobile. He has the feeling that he can do anything; that he is taller, stronger, wiser, and more expert than anyone. He tears down the road at seventy-five miles an hour, but thinks he is creeping along. He goes through a red light, which he thought was far off from him. He does not see or hear signals, and time and distance deceive him; the first seems to go slowly, the second seems increased.

"In the third stage, the marihuana addict becomes a fiend. The pupils of his eyes grow big, his eyes stare wildly, and he grows afraid.

"This stage is dangerous to others. He suspects everyone, even his best friends. The one big idea he is likely to have is to kill. From India, from the Malay States, and from the Philippines, come stories of wild-eyed assassins who have run amuck with a sharp, curve-bladed snickersnee, hewing down all they meet. Cooks who do wholesale killings with butcher knives are in this stage of marihuana madness.

"A high-school boy who had been tempted to try a 'reefer' stepped out on the street while in this mad stage. There he saw a crippled bootblack at his stand.

"To the boy's crazed brain, the cripple was an

enemy, and, rushing home, he came back with a gun and shot the poor bootblack. And, like all addicts who commit crimes while in this stage, he later said he could remember nothing of his act.

"Here are case studies of acts of marihuana addicts, in each instance a young boy:

"1. Held up and killed a bus driver.

"2. Killed his best friend.

"3. Robbed and killed a hotel clerk.

"4. Shot a man in a holdup.

"5. Killed his father, mother, sister, and two brothers with an ax.

"When asked about their crimes after the drug effect has died out, they say: 'I do not know what happened. Everything is a blank.'

"As the mad stage passes, the marihuana smoker becomes very sick. He vomits, and then falls into a heavy, helpless stupor. His sleep is restless, and he dreams wild dreams.

"It is only a few steps from a marihuana smoke to the insane asylum.

"Marihuana is an outlaw. It is against the law to grow it, sell it, or have it in one's possession.

"Dr. Merrill has the following to say as to what to do about it: 'Every state has peddlers who try to lure children with cigarettes in which there is

marihuana. . . . The louts who sell it should be sent to prison; but the best way to "spike" the use of the dope is to tell the truth to growing children.'

"What can be done to prevent its use?

"Children should refuse to take candy or any drink offered them by a stranger.

"They should report to the principal of the school, their father and mother, and the police anyone who grows, has for sale, gives away, or smokes marihuana.

"Anyone who tries to give away any sort of cigarettes to children and youth should also be reported; he may be a marihuana peddler.

"If by any chance they hear of an addict, they should keep away from him. Who knows who will be his next victim?

"Marihuana is of no use in medicine. No one uses its fibers today to make homespun clothing or hats. Cotton, Manila hemp (the fiber from a kind of banana plant), wire, and flax are much better for twine and rope.

"Indian hemp is a plant that is of little use, and one that the world would be better off without. It should be entirely destroyed.

"I have told about a new drug, called Indian hemp and marihuana. A long time ago, the fibers were

used for hats, belts, mats, and twine. Now it has little real use.

"It is taken by smoking, by drinking extracts and tinctures, and by eating it in candy. It causes complete loss of the senses, and may result in terrible accidents and crimes. It is against the law to grow it, carry it, sell it, or use it. It should be entirely wiped out.

"Helen will now tell you about other harmful drugs."

Things to Do

1. Find out what things are made of hemp, and list them on a poster. Opposite this list put the names of other raw materials from which these same things may be better produced. Do we need hemp for any good purpose?
2. Show on a poster, or in some other way, the "plague spots" from which the use of marihuana is spread: low-class drugstores, pool parlors, drinking places, et cetera.
3. Write a booklet in which you tell why peddlers of drugs, including marihuana, like to have children form the drug habit.
4. Make a map showing where marihuana is grown and used.

For Review and Test

1. By whom has the use of marihuana been brought into this country?
2. How is marihuana taken into the body?

3. For what reasons is marihuana looked upon as the most dangerous narcotic?
4. How is it often given to young people without their knowing it?
5. What is the best way to safeguard ourselves against marihuana?

Notes on Books

Just to show you that marihuana is bad, you might read "Youth Gone Loco; the Villain in Marihuana," in *Christian Century,* vol. 55, pp. 812-819 (June 29, 1938); and "Marihuana, Assassin of Youth," in *American Magazine,* vol. 124, pp. 18, 19 (July, 1937). Same in *Reader's Digest,* vol. 32, pp. 3-6 (February, 1938), and "Marihuana, Mexican Dope Plant," in *Nature Magazine,* vol. 31, pp. 271, 272 (May, 1938). Then you may also see *"Science Speaks,"* pages 5-17, and *"Plain Facts,"* pages 18-26.

Not all soda-fountain drinks are wholesome.

HELEN'S STORY

Bromides and Other Harmful Drugs

"OPIUM, morphine, cocaine, and marihuana are known to be harmful. Few persons can be fooled by them.

"There are other harmful drugs that are not so well known. Such are bromo-seltzer, anacin, pyramidon, aspirin, luminal, and veronal.

"They may be bought by anyone, anywhere. They are taken in tablets, powders, and drinks. They are given to ease pain and to induce sleep. Most of them are sold at the soda fountains and in restaurants.

"Their use often results from an attempt to cure the effect of some other bad habit. For example, Mr. Abe takes alcohol. He feels sick and headachy the next day. He takes a glass of bromo-seltzer. After a few doses, he has the bromide habit.

"Or Mrs. Abe goes to a party. She smokes too much, gets tired out, becomes excited, and when she gets to bed, finds she can't sleep. She turns to the medicine cabinet for a bromide tablet to put her to sleep. After a few more parties, she can't rest without her tablet.

"Another ailment for which people look for quick cures is the common cold. They rush to what they think is a cold cure; often it is a bromide tablet. The result is another drug addict.

"These so-called cures are made from coal-tar products. They cause anemia (lack of red blood), loss of memory, dullness, and heart trouble. The skin loses its pink color, and turns a dingy blue.

"There is always a risk in giving headache tablets and other painkillers to children. They may be easily hurt by the poison. Sometimes a small dose is fatal.

"The poison that is to blame for the injury has a long, hard name. It is acetanilide (ac-et-an′i-lĭd).

"Look for this name on the label. If you see it, don't take the medicine.

"And here is a list of more bad poisons that you want to leave alone. Look for these on the label; and don't take the medicine unless your doctor tells you to.

strychnine (strych′nĭn)	thyroid (thī′roid)
cinchophen (sin′ko-fen)	chloroform (klō′ro-form)
bromide (bro′mīd)	iodine (ī′o-dīn)
nux vomica (nuks vŏm′ĭ-ka)	aloes (ăl′ōes)
formaldehyde (for-măl′de-hīd)	lead compound
amyl alcohol (ăm′ĭl al′ko-hol)	santonin (săn′to-nin)
dinitrophenol (dī-nī-tro-fe′nōl)	arsenic (ar′se-nik)

"Put all these names on the black list, and keep them out of the medicine cabinet.

"The bromides are among the worst. In a new book, '*The American Chamber of Horrors*,' the author tells of an addict who was sent for the fourth time to an insane asylum.

"He was an artist, a man of good family, and earned a good income. To clear his head and steady his nerve, he took bromo-seltzers, five a day, at the soda fountain. They made him a complete wreck.

"He went about in a dazed condition. He could not work. He was not safe at large. He was sent to the hospital for the insane, and his family went on the relief roll.

"A doctor gives the case history of a bromo-seltzer addict:

" 'For ten days, he did not know who or where he was. He saw mice run up his pants leg, a duck in his bed. He felt as if cold water were being poured over him.

" 'He refused to eat because he thought he was being poisoned. He became violent in his efforts to escape. On the tenth day . . . he thought he saw snakes in his bed.'

"Bromides produce a form of intoxication like that of the worst narcotics. At first the addict is drowsy; later he gets nervous, snappy, and then violent.

"He takes more bromides to calm himself. His speech is thick, he cannot walk, his memory fails, he loses track of time and place. He sees terrible things. He tries to escape, and, in this stage, may hurt himself or others. After the excitement is past, he falls into a coma.

"You can see that bromides cause delirium tremens much as alcohol does; and, like all habit-forming drugs, one dose calls for another. Therefore it is not safe to take even one dose. Every year the American people spend more than twenty million dollars to dope themselves with harmful bromides. This is enough to pay the expenses of 20,000 students at college.

"Very few persons who see that there is acetanilide in a headache powder know that it may kill them. Very few know that it depresses the heart, destroys the power of the red blood corpuscles to carry oxygen, and that it may enslave them to drugs.

"In '*The American Chamber of Horrors*' (page 84) the author says that saltless cooking may be to blame for the craving for bromides.

"Bromide intoxication occurs when 30 per cent of the body salt has been replaced with bromides. Forty per cent is said to be fatal.

"Veronal and luminal are other coal-tar drugs. They leave weak muscles, lack of appetite, and dizziness. A person who takes these drugs often loses his memory and lacks pep. He is likely to complain of eye trouble. He may be slow and halting in speech.

"Aspirin is not the harmless remedy that advertisers claim it to be. It cannot prevent a cold, nor can it cure one. If it is taken for a long time, it may cause weakness of muscles and loss of vision.

"Aspirin often causes swelling of the face and throat. It is bad for children, who may be hurt by small doses. It contains an acid that decomposes as it ages and is harmful to the stomach.

"There are better ways to prevent and cure colds. To prevent them, follow this plan:

1. Play in the sunshine outdoors every day or take regular sun baths.
2. Keep away from persons who have colds.
3. Eat leafy green vegetables and raw fruits.
4. Eat fresh butter and drink fresh milk.
5. Get plenty of rest and sleep.

"If you get a cold, go to bed, and keep well covered. Eat good foods, and drink milk and lemonade. Take sun baths if you can; if not, try baths in ultra-violet light. Use no drugs.

"To sleep well at night, have lively play and work during the day, part of the time in the sun and fresh air; but do not get too tired. Eat good food, and avoid exciting games, stories, and radio plays just before bedtime. Go to bed at the same hour every night.

"Just before bedtime, take a warm bath. Relax in the warm water five or ten minutes after the bath. A drink of warm milk and a little food—crackers or cookies—may help.

"Then get into a clean, soft bed, put out all lights, and just go to sleep. Have fresh air in the room, and only enough covers to keep you warm (not hot). Children ten to twelve years old need about nine and a half hours' sleep each night. Get up promptly in the morning. No one who lives a healthy, happy life needs drugs to make him sleep.

"If you have headaches, find out the cause of them.

"They may be caused by eyestrain, bad teeth, disease, fatigue, poison, and need of food.

"Some persons are sensitive to foods such as crab, lobster, pork, cabbage, cheese, veal, shrimp, onions, turnips, and chocolate. Such persons may be thrown into severe headache spasms by eating them.

"To prevent headaches, avoid the cause; to *cure* them, remove the cause. Watch your daily habits; get rest, sleep, play, and food.

"Do not drink coffee, tea, or chocolate. Tobacco, patent medicines, and drugs should be thrown away.

"Put good-health ideas into practice, and headaches will disappear.

"I have told you about several bad drugs," said Helen. "They are the kind that are found in headache tablets and drinks, in remedies for colds, and in sleep-inducing medicines.

"They create the drug habit. They cannot cure anything, but may do great harm. They cause delirium and death.

"There are better ways to cure colds and headaches, and to get to sleep.

"James will now tell you about tobacco."

Things to Do

1. Make a poster showing pictures of bottles and boxes, on which you write the names of bad drugs such as bromides. Use slogans or signs to warn against them.
2. Study the show windows and signs of drugstores and soda fountains. List any harmful drugs you see for sale.
3. On a poster called "The Skeleton in the Cabinet," give the names of dangerous cosmetics, drinks, and remedies of which most persons know nothing.
4. Write a booklet telling how to care for the skin, hair, lips, teeth, and hands without using dyes, bleaches, paints, et cetera.
5. In the same way, tell how to get sleep and rest; how to avoid colds; how to keep from getting fat; or how to keep up your pep.

For Review and Test

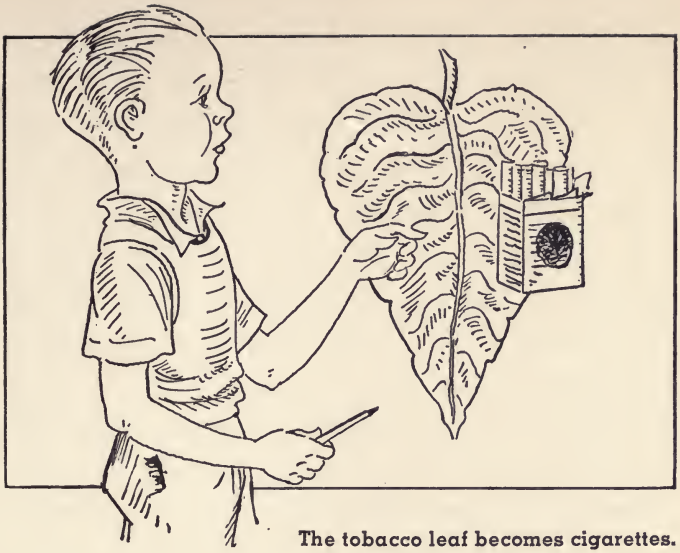
1. Why do people take bromides?
2. Where are bromides usually sold?
3. How do bromides affect the body?
4. Why do people get headaches?
5. What are the best "remedies" to offer to a person who cannot sleep?

Notes on Books

We come back to *"Narcotics and Youth Today"* (page 13), and to *"Alcohol and Habit-Forming Drugs"* (pages 199-202). Grown-up books such as *"The American Chamber of Horrors," "Take Care of Yourself,"* and *"Poisons, Potions,*

and Profits" have plenty of facts in them. Two other books you may want to read some day are: *"100,000,000 Guinea Pigs"* and *"40,000,000 Guinea Pigs."* This last is about children.

See also *The American Journal of Public Health,* vol. 27, pp. 1286, 1287 (December, 1937), on "We Need a New and Strong Food and Drugs Acts."



The tobacco leaf becomes cigarettes.

JAMES'S STORY

TOBACCO: *What It Is and Where It Comes From*

"TOBACCO is a plant belonging to the potato family. Among its relatives are the tomato plant, the red pepper, the eggplant, jimson weed, and deadly nightshade.

"The leaves of all these plants are thick and juicy, and have a rank, sickening smell. All contain poisonous substances, and those in jimson weed, nightshade, and tobacco are very powerful.

"The tobacco plants range the globe from Quebec and Norway on the north, through the tropics, to Chile, Australia, and Cape of Good Hope on the south.

In this country tobacco is grown as a market crop in eighteen states.

"The leading tobacco states are North Carolina, Kentucky, Virginia, Tennessee, South Carolina, Pennsylvania, Georgia, Maryland, Wisconsin, and Connecticut.

"South of us, thousands of pounds are grown in Mexico, Cuba, Haiti, Brazil, and Chile.

"The main countries of the Old World that grow tobacco are India, Sumatra, Russia, Egypt, Turkey, Greece, Italy, France, and Germany. Large amounts are also grown in China, Japan, and South Africa.

"Tobacco contains a clear alkaloid poison, which vaporizes easily in air. It is called *nicotine*, and is one of the most deadly poisons known.

"The nicotine content varies from 2 per cent in bright-leaf tobacco to 5 to 8 per cent in dark. The ash content runs from 10 per cent in bright-leaf to 25 per cent in dark.

"A small drop of nicotine on the gums or tongue of a cat will kill the animal. Two drops will kill a dog. A rabbit may be killed instantly by injecting a tiny drop of nicotine under the skin or by putting

the same amount in its eye. The fumes from a pencil point dipped in nicotine will kill a bird. The death dose for a man is from one to two drops.

"One writer says that there is enough nicotine in a cigar to kill two men. The amount of nicotine in a cigarette is about one fifth to one sixth as much as in a cigar. It would be dangerous to chew and swallow three cigarettes.

"Quoting Dr. Henry S. Williams on nicotine: 'It is one of the most rapid and fatal of poisons. The fatal dose for a man is about 60 milligrams. This is a little less than one grain.'

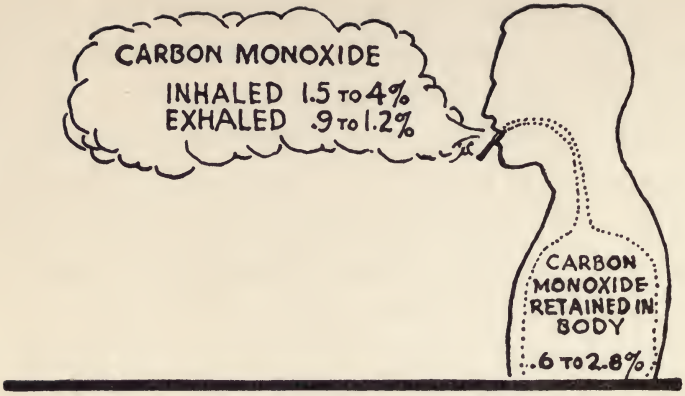
"Two grams of tobacco are a fatal dose. This is about 30 grains.

"Only one poison, hydrocyanic acid, is quicker than nicotine.

"Tobacco contains also the salts of acetic, nitric, malic, and oxalic acids, and small amounts of tannic and pectic acids.

"The burning of tobacco as in smoking produces other deadly poisons. One of the strongest of these is carbon monoxide. It is a form of gas, and is the same as is forced out of the exhaust pipe when a motor is running.

"As tobacco smoke goes into the mouth and nose, it contains from 1.5 to 4 per cent carbon monoxide.



Smoking causes carbon monoxide to pile up in the body.

As it comes out, it contains from 0.9 to 1.2 per cent of that deadly poison.

1.5— .9= .6 per cent
4.0—1.2=2.8 per cent

"From 0.6 to 2.8 per cent has been left in the blood. In the red corpuscles, it takes the place of oxygen. It is this lack of oxygen in the blood that makes a smoker short-winded.

"Other 'smoking' poisons that get into the body are carbon dioxide, ammonia, furfural, pyridine, formaldehyde, and prussic acid. There is also some collidine, an alkaloid, 'more poisonous than nicotine,' that causes giddiness when breathed a few seconds.

"The amount of nicotine that gets into the blood varies in several ways; in cigarette smoke is found

80 per cent of the nicotine in the tobacco; in cigar smoke, 90 per cent. For every gram of tobacco smoked, from three tenths to eight tenths milligram is kept in the body. This is from 6 to 16 per cent of a deadly dose.

"In *Fortune* magazine for September, 1935, it was said that the cigars and cigarettes consumed every year in the United States fill the smokers' bodies with enough nicotine to wipe out four times the people of the earth.

"Damp tobacco produces more nicotine than dry.

"In its most powerful form, nicotine collects in the butt end of cigars and cigarettes, and in pipe bowls and stems. A child may be killed by the poisons in an old pipe. People who pick up and smoke 'snipes' and stubs run great risk of being poisoned.

"Poisons are sometimes put on and into tobacco. To kill pests, the plants are sprayed with arsenic. This sticks to the leaves, and is now and then found in cigars, cigarettes, and smoking tobacco.

"Some of the Turkish tobaccos are washed in water in which opium has been dissolved; and the drug-tainted leaves are shredded for pipes and cigarettes.

"You may have seen cigarettes advertised with the claim that all nicotine has been extracted from

the tobacco. Tests show that this claim is false; and along with nicotine are the other poisons formed from smoking. No tobacco addict would care for a cigarette without nicotine in it.

"A nonsmoker has to suffer from tobacco, for he has to breathe the poisons forced out of the mouth and lungs of smokers. He may be poisoned in this way by nicotine, carbon monoxide, prussic acid, ammonia, and collidine. He does not get as much of these poisons as does a smoker, who has also the dose from inhaling directly, and absorbing through the mouth and stomach. The smoker, too, must breathe again the same poisonous air.

"Thus, when you are asked, 'What is tobacco?' you have to take account of the kind, where it is grown, with what it was sprayed, how it was prepared, how it is taken. In all cases, tobacco contains the narcotic, *nicotine*, which may be inhaled, swallowed, and absorbed into the body.

"Let us now see something of how tobacco is grown and what its history has been.

"The tobacco plant is native to America. It is a coarse, rank-growing annual, with a simple unbranched stem. It grows from two to six feet high.

"At the top is a cluster of bell-shaped flowers, rose-colored on some plants, but a light-pink or

greenish-pink on most of them. Each flower has a long tube like a trumpet funnel. The broad end is cut into four or five sections.

"The lower leaves have stalks; the upper ones fit close to the stem. Hill tobacco has long, sharp leaves; valley tobacco has broad, blunt leaves.

"Both the stem and the leaves are covered by soft hairs, which secrete a dark, sticky juice. Green leaves have a rank, acrid odor, which causes nausea and headache. The seeds are tiny, rough on the surface, and brown in color. One plant may bear a half-million seeds or more.

"The seeds are sown in hotbeds or in cold frames from January in the south to April in the north.

"The seed beds are covered with glass or a thin gauzy cloth to keep the plants warm and safe from frost.

"After the young plants are well started, they are transplanted by hand or machine to open fields. The rows are from three and one half to four feet apart, and the plants are spaced sixteen to twenty-four inches apart in the rows. A half ounce of seed will grow 40,000 plants.

"Growing tobacco is hard work. The fields must be cultivated often by plowing and hoeing. As the plants grow, suckers shoot up from the main stem,

and must be broken off carefully by hand. The flower stems are 'topped' just before they bloom.

"Many pests attack the tobacco plant. One of the worst is the tobacco worm. It is also known as the horn worm or horn blower.

"Tobacco worms are big green caterpillars, with white stripes on the side of the body. They are often two inches long. They eat tobacco leaves. After they are full and fat, they drop to the ground in the pupa stage. From the pupae in May or June come white moths, which lay eggs on the under side of the leaves. These eggs hatch into worms, of which there are two crops a season.

"Children are sent into the tobacco fields to pick off the tobacco worms and kill them. This is unpleasant work, and the smell of the green leaves may make the workers sick.

"Among other tobacco pests are the bollworm, which also eats the tomato plant, and a budworm, which comes from the eggs of a small green moth. The tobacco leaf miner, cutworms, mealy bugs, and several kinds of plant lice, live on tobacco.

"There is the cigarette beetle, which eats tobacco after it has been dried and made up into cigars and cigarettes. The drugstore beetle and the rice weevil also like to eat tobacco. In all, there are more than

one hundred kinds of lice, scale, bugs, beetles, weevils, and worms that eat tobacco.

"Most of these pests can be killed by sprays. For sucking bugs, the tobacco farmers spray with kerosene and soap. For worms, bugs, lice, and beetles, they spray with arsenic. This is a most dangerous poison.

"You see that poisons may get into tobacco from sprays.

"When the leaves begin to turn yellow, and before frost comes, they are harvested. The lower leaves are ready first. This cutting is called 'first priming.' After a 'second priming,' the stalk with the upper leaves is cut.

"The leaves are taken to big tobacco barns or sheds. They are strung on lathlike poles, and hung up with the leaf points down, to dry.

"This is called 'curing.' Tobacco is 'cured' by forcing warm air into the shed, or by building open wood fires under the leaves. The first is 'flue-curing,' the second is 'fire-curing.' Tobacco is also 'sun-cured.'

"After the leaves are 'cured,' about a dozen are tied into 'hands,' and are allowed to ferment. Then the tobacco is graded and pressed into big casks or bales, and put into warehouses for aging.

"When it has aged enough, the center leaf stem

is stripped out and the soft leaves are pressed into cakes. The cakes may be sweetened and flavored for chewing; or they may be sent to knife machines where they are cut into shreds, after which the tobacco is 'panned' or 'roasted' to dry out the moisture.

"In this way, all tobacco is 'toasted.'

"It is ready to be made into cigarettes and put into cans for pipe smokers."

Things to Do

1. Make a picture map of the United States, showing where most of the tobacco is grown, manufactured, and used.
2. List on a poster the states in the order of money in savings banks. List in the same way as many states as you can in the order of the amount of tobacco grown, manufactured, and used. Do states that save the most have the most tobacco? (See *"World Almanac"* for figures on savings.)
3. Gather cigarette and cigar "pictures" from magazines. Are they alike? What do they picture?
4. Collect also as many slogans as you can about cigarettes. Are these slogans true?
5. Explain why tobacco companies give prizes for coupons and cigar bands, and why they conduct contests. You may use a scrapbook or a booklet for this.

For Review and Test

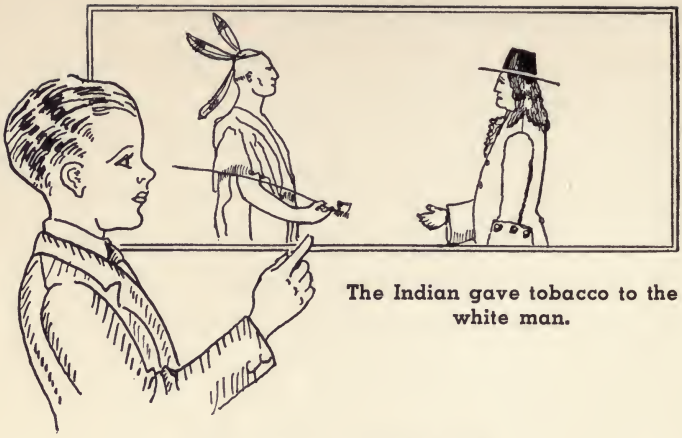
1. What plants belong to the tobacco family?
   Do their leaves contain poison?

2. How did the Indians use tobacco?
3. Does the tobacco grower make much money?
   Does tobacco help the soil?
4. Name the substances that are found in tobacco.
5. What are the chief tobacco pests?
   How are they controlled?

Notes on Books

The best book on tobacco dangers is *"The Cigarette as a Physician Sees It,"* by Dr. Daniel H. Kress. To find out how it is grown, if you do not live in a tobacco district you may have to depend on your Book of Knowledge or on the encyclopedia.

In the magazines, "Only the One I'm After," in *Scribner's* magazine, vol. 104, pp. 12-14 (April, 1938), tells of persons who pick up cigarette butts; and, in *Fortune,* you will find a survey of the tobacco business—vol. 16, p. 104 (July, 1937) and vol. 18, p. 76 (August, 1938).



The Indian gave tobacco to the white man.

BOB'S STORY

The History of Tobacco and Its Use

"ALTHOUGH tobacco has not been known to white men as long as alcohol and opium, it has an interesting history, which goes back to the Mound Builders. I will tell you something about it," said Bob.

"Civilized men got the tobacco habit from savages.

"When Columbus found the West Indies, he saw Indians smoking tobacco. They used a pipe with a three-pronged stem. Two prongs were put into the nostrils; the third was held in the pot of burning tobacco. This apparatus the natives called *tobaco.*

"In 1519, when Spanish armies went into Mexico, they found the Indians growing patches of what they

called 'tabaco.' It was smoked in pipes and cigars, and the Indians said the smoke was a cure for asthma, bronchitis, and rheumatism.

"In 1555, a Frenchman saw Indians of Brazil and the Orinoco smoking tobacco leaves rolled in a leaf of corn or palm. He saw them using snuff; and, in North America, there are early stories of Indians who chewed tobacco.

"The oldest pipes have been found in big mounds of earth (pipe mounds) in Ohio, Indiana, and Missouri. They were made of stone, bone, wood, or clay.

An Indian peace pipe.

"They were made in a curious way: First, a base nearly as big as a saucer was carved or molded, with a small bowl in the center. A fine hole or *pipe* led from the outside of the base under and into the bowl.

"Tobacco was put into the bowl, a small coal or spark was put on the tobacco, and air was blown through the stem. This made puffs of smoke. These people did not draw smoke into their mouths.

"I do not know whether or not these Indians ever 'smoked' tobacco for its narcotic effect. Fire was a

thing of mystery to them, and may have been worshiped. Besides, they used smoke signals to warn their friends and to convey messages. To them, puffing or blowing *out* smoke was a religious ceremony, the nature of which is seen in the ceremony of smoking the peace pipe. The magic fire was lighted, and smoke was blown from the pipe toward earth and heaven.

"The peace pipes had small bowls and long stems. The bowls were made of a soft rock called pipestone. If tobacco were not at hand, Indians smoked the peace pipe with willow bark.

"In 1558 tobacco was taken to Europe from Mexico, by Francisco Fernandes. Some of the leaf and seeds were sent to Catherine de' Medici, queen of France, by her Minister to Portugal, Jean Nicot. The story is that the queen smoked some of the tobacco, and was made very sick by it. When the poison in tobacco was found, it was named nicotine, after Jean Nicot.

"Sir Walter Raleigh is said to have been one of the first smokers in England. He thought that smoking was a remedy for dyspepsia. An old story tells that his servant, seeing the smoke coming out of his nose, thought he was on fire, and dashed a pitcher of water over him. He made smoking popular among the

courtiers, by taking 'a pipe of tobacco a little before he went to the scaffold.'

"The fad caused a demand for American tobacco, and planters began to raise it as a 'money crop' to ship to Europe. To do the hard work in fields and sheds, they bought more slaves, and thus tobacco helped to fasten slavery on America.

"Now about two fifths of a million American families grow tobacco, and plant almost two million acres a year. This averages five acres a family, for the crop. They are paid $200,000,000 a year.

"This is $100 an acre, so to the average grower goes an income of $500 a year. This is poor pay for plowing the ground, setting out the plants, plowing and hoeing, pulling off suckers, worming and spraying, cutting, curing, and packing.

"Tobacco growing does not pay.

"Tobacco is very hard on soil. It uses up valuable minerals, and field after field has been worn out to provide the nicotine to satisfy a harmful and useless habit. The better farmers now put bone meal and dried blood on the soil to keep up its fertility.

"The use of tobacco today is more widespread than any other narcotic. This does not mean that more pounds of tobacco are used; in fact, there is a decline in the number of pounds used. Sixty times

as many cigarettes are smoked today as were smoked thirty years ago. Double the amount of smoking tobacco is sold.

"However, cigar smoking is going down, with less than three-fourths as many smoked today as were smoked thirty years ago. The big decline has been in Class B and Class C cigars. It looks as if smokers of cheap cigars have quit.

"Less than one half as much chewing tobacco is sold today as was sold in the past. This is because people are more careful about their looks.

"Is tobacco of any use? Does it meet any real need?

"Its use is very slight. Years ago it was tried in medicine, but caused many deaths. No doctor prescribes it today.

"Once in a while an ignorant or old-fashioned person will advise you to put tobacco leaves on a wound.

"One should never do this. Bugs, beetles, lice, and worms have crawled over the leaves. They may have left poison or germs. Should arsenate of lead get into the wound, it might cause illness.

"Besides, the nicotine in tobacco would pass into the blood stream and poison you. Deaths have been caused by tobacco used on wounds and bites.

"Says Dr. Henry S. Williams: 'Tobacco has no medicinal use. It may not safely be used as a poultice.'

"A long time ago, tobacco chewers said that tobacco in their mouths killed disease germs, and kept them well. This has been tried out, and does not work. A nicotine solution in the mouth strong enough to kill germs would kill a man. Scientists have also proved that tobacco smoke will not kill germs.

"But will tobacco preserve the teeth?

"No, tobacco does not prevent any tooth disease. Tooth decay may be due to lack of proper food. Tobacco is more likely to make it worse than to help it.

"Dr. Walter L. Mendenhall says: 'The antiseptic value of tobacco in the mouth is zero. Tooth decay may go on (and does) in the mouth of a heavy smoker, and there are cases of pyorrhea reported in those who smoke.'

"Moreover, tobacco stains the teeth. You can easily see the signs of this in a chewer. Cigar and cigarette smokers also get tobacco stains on their teeth.

"Tobacco will kill several kinds of plant pests, but it will not kill all, for, as you already know, many pests live on the tobacco plant.

"Tobacco waste makes a strong, black spray, which, mixed with water, is used to spray rosebushes

for aphids. It is a strong poison, and should never be tasted or even smelled.

"This is the sole use to which tobacco may be put, and there are other sprays as good and better.

"Acting on the rule that things which do no good and do harm should be destroyed, tobacco, with marihuana, would have to go. But its effect on health, skill, and work belongs to Carl's story.

"I have told you that tobacco is a plant native to the Americas, and was smoked, chewed, and snuffed by ignorant savages. It belongs to the age of stone axes and bows and arrows.

"Tobacco contains one of the most deadly poisons —an alkaloid known as nicotine. A small dose is fatal.

"Tobacco is grown in many parts of the world. It exhausts the soil quickly, and does not return much profit to the grower.

"Tobacco meets no need; though a solution of its wastes makes a poison spray.

"Carl will now tell you how tobacco affects the body."

Things to Do

1. Mold out of clay one of the ceremonial pipes of the kind found in Indian mounds. This might also be carved out of wood or soft stone.

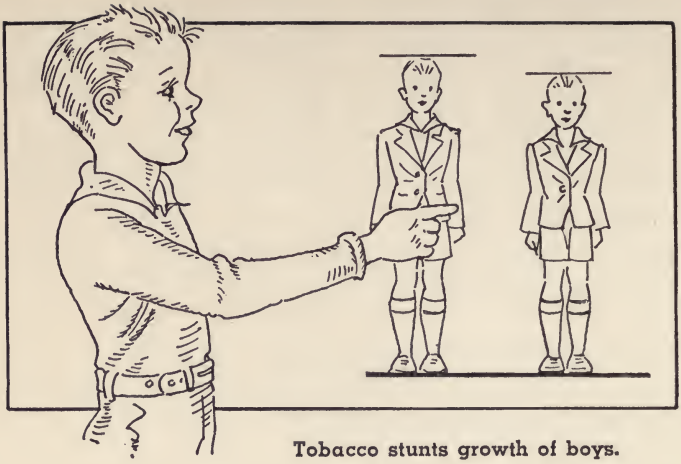
2. Put in a booklet all the old stories and pictures you can find about tobacco. These can be found in history books.
3. Make a poster on which you show as many false old-time ideas of "cures" and medicines as you can find.
4. Collect and exhibit advertisements that show tobacco in the field, being cured, sorted, or in any other process of preparation.
5. Make drawings of Indian peace pipes, and describe the ceremony of smoking the peace pipe.

For Review and Test

1. Why did Sir Walter Raleigh wish to introduce smoking into England?
2. How was tobacco growing tied up with slavery?
3. Tell about the changes taking place in the use of tobacco.
4. Is tobacco useful for anything? Will anything take its place for killing rose aphids?
5. Will the chewing of tobacco kill disease germs in the mouth?
   Will tobacco smoke kill disease germs?

Notes on Books

There is no really good book on the history of tobacco and other narcotics. Grown-up books that tell part of the story are Albert E. Hamilton's *"This Smoking World,"* in which there is a section on the early story, and several pages of "events." B. W. Arnold has written a book, entitled *"The History of the Tobacco Industry."* Probably the best sources for our own study are the encyclopedia and texts in American history.



Tobacco stunts growth of boys.

CARL'S STORY

The Effects of Tobacco on Growth and Learning

"I SHALL tell you of the effects of tobacco on the body," said Carl. "First, I shall tell about tobacco and growth.

"The growth period for boys and girls lasts to the age of about twenty-one. If they do not grow during these years, they will never grow.

"If they are stunted during the growing years, they never 'catch up.'

"When boys and girls are in good health, they

begin to grow very fast at about the age of eleven. Girls start this fast growth sooner than boys do. Girls of thirteen, fourteen, and fifteen are usually taller and heavier than boys of the same age.

"When they are about fifteen years old, boys 'catch up' with girls in growth. From fifteen on they tend to be taller and heavier.

"Your growth depends upon your doing what is good for you and not doing what is bad for you.

"What are some of the things that are good for you?

"Food, a good appetite, health, sunshine, exercise, make for growth.

"Does tobacco keep you from using these good things for growth?

"Yes, it does. Tobacco lessens the appetite. Many persons are nauseated by tobacco. They do not have an appetite for food. This is true of young people whose nerves are not yet numbed by the narcotic, nicotine.

"Sunshine adds to growth, and so does exercise. Tobacco users are more likely to remain idle and keep out of sunshine, and refuse to play. You cannot smoke while you are playing a good game of football, basketball, or baseball.

"Growth does not take place while you are sick.

"Tobacco makes you sick. It causes dizziness, trembling, headache, faintness, weak muscles, and low pulse.

"Here is a table that shows how an eight-year-old boy grew in weight for the ten months of school. You will notice there are two months when his growth stayed the same, and one month when he lost a half pound. These months were February, March, and April. In March, when he lost weight, he was ill.

GROWTH OF A BOY IN WEIGHT

Month	Weight	Gain
September	56.50	
October	57.00	0.50
November	58.25	1.25
December	60.13	1.88
January	60.50	0.37
February	60.50	0.00
March	60.00	Loss 0.50
April	60.00	0.00
May	60.50	0.50
June	61.00	0.50
Total Net Gain		4.50

"Tobacco smoke delays the growth of plants. This may not be due to nicotine alone, since any kind of smoke seems to have the same effect. However, the fact remains that nicotine smoke injures plant life and growth, and causes stunting.

"Young animals that are put under the influence of nicotine stop growing. The few experiments on guinea pigs, having them inhale tobacco smoke, shows a growth of .5 per cent below normal at the end of 45 days.

"If the eggs of the sea urchin are put in water in which there is a drop or two of nicotine, the action of the eggs is reduced, and many of the young are deformed. A strong solution kills life in the eggs.

"Tobacco smoke and nicotine injure hen's eggs. When put into an incubator later, few chicks grow. Many are deformed.

"Young rabbits that are given nicotine remain thin and backward in their growth. Dr. C. Fleig says that if guinea pigs are treated with tobacco fumes, all the young are deformed or born dead. The live ones grow slowly, and do not live long. Few ever grow to adult size.

"After 45 days of inhaling tobacco smoke, a guinea pig weighed 174 grams. It was not given tobacco for 45 days. At this time, its weight was 295 grams. This weight was only 60 per cent of what it should have been.

"In a study of the effects of tobacco smoke compared with the effects of nicotine on young white mice, it was found by Dr. Nice that they grew at

the same rate. Tobacco smoke caused many of the young to be born dead (37 per cent in the first generation; 26 per cent in the second).

"Rats are very sensitive to nicotine. They become thin, and die within a few weeks when a weak solution is injected under the skin. When gray rats are fed tobacco in food, they die in 9 days.

"Plants, sea urchins, guinea pigs, rats, and rabbits are not children. Might not nicotine hurt the growth of these plants and animals and still not retard the growth of children? you may ask.

"All growth obeys the same laws. True growth depends upon changes in protoplasm; and the protoplasm of plants and that of animals react to the same forces and causes.

"Many measurements of college freshmen have been made. They tell us that smokers are shorter and have lower lung capacity than nonsmokers.

"But is it smoking that causes these young men to be smaller? We do not know for sure. Some suspect that 'runts' and boys growing at a slower rate are not made small because they smoke, but smoke because they are small. They think a cigar, a cigarette, or a pipe makes them look bigger and more 'like a man.'

"There are other facts showing that tobacco limits

growth. Nicotine's first effect is to paralyze the small nerves that control the adrenal glands, which are perched on top of the kidneys.

"These glands secrete adrenalin (ad-ren'al-in), one of the most powerful stimulants there is. When these nerves are paralyzed by nicotine, adrenalin rushes into the blood stream and sets blood sugar free. But at the same time, the nicotine lowers the power of oxidizing sugar by depressing the medulla, that part of the brain which controls the rate of breathing. This lowers the oxygen supply, which is made still lower by carbon monoxide from smoke, which finds its way into the red blood corpuscles.

"The blood sugar that was ready in the blood for energy is lost. Its waste piles up in the body as lactic acid.

"When energy is demanded, the body draws upon its supply of growth foods. Foods that are used for work cannot be used for growth. Hence, the growth rate of young tobacco users is less than it would be if they left it alone.

"A record of growth month by month would show many zeros and minuses for smokers.

"The editor of *Tobacco Leaf*, a magazine of the tobacco trade, says: 'I do not approve of tobacco for growing boys and girls.'

"Every state has a law against giving or selling cigarettes, cigars, or tobacco in any form to persons under twenty-one. It is against the law for parents to give their own children tobacco. These laws are passed to protect you, and if you know of anyone who gives or sells tobacco to young people, you should report him.

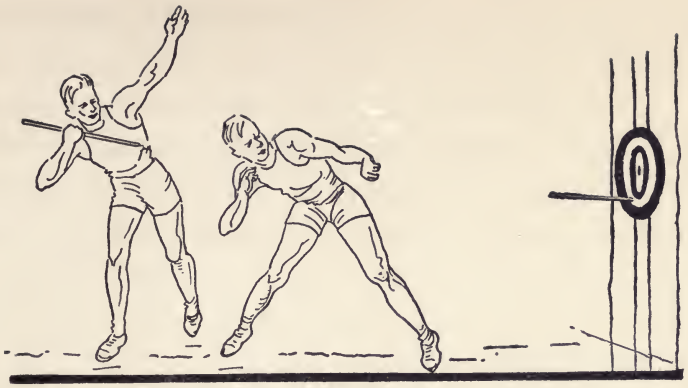
"Tobacco has a marked effect upon muscular strength. On beginning the drug, the hands tremble and the muscles of the whole body become slack and weak.

"There was a time when tobacco was given to patients to relax their muscles before an operation.

"An experimenter at the University of Michigan tested his strength on days when he smoked and on days when he did not smoke. The smoking of five cigars caused a loss of 41 per cent in strength and ability to work. In other words, five cigars made him only three fifths the man he was when he was not smoking.

"In football, track, and aviation, men are timed to the split second. The brain must be clear, the muscles quick and strong.

"Basketball calls for hard, fast play. Baseball demands accuracy and speed. Men who 'muff' the ball cannot make the team.



Smokers are not good at target practice.

"One of the first signs of smoking in a young person is shortness of breath. This is a big handicap to the athlete. 'It is not worth while to train a smoker,' say the coaches.

"Walter Johnson, one of the greatest pitchers baseball has ever known said: 'During my twenty years in the big leagues, I have seen the careers of many fine young ball players ruined by tobacco. Cigarettes are very bad, and my advice is to let them alone.'

"A maze test and a target test were used by Dr. Fisher and Berry to find out what the effect of tobacco is on control. The men to be tested first filled in a blank in which the ability to trace a maze made of lines three sixteenths of an inch apart meas-

ured control. They took half of this control test at this time.

"They then went to the test room where a target fifteen inches in size, divided into circles, one inside the other, was put on the wall, shoulder high. Using a foil (a light stick) they thrust at the target, trying to hit the bull's eye (the center). A bull's eye gave a score of 6; the next space, a score of 5; the next, 4; and so on down to 1.

"Fifty thrusts were taken, and the average of each 5 thrusts was taken as a 'score.' There were thus 10 'scores' for every test ($50 \div 5 = 10$).

"After the tests, they smoked two cigars, which took 50 or 60 minutes. They then took the target test again, and filled in the rest of the maze test.

"And here are the results of this experiment:

1. All subjects showed a loss in scores after smoking.
2. The regular smokers made higher scores when they had not smoked for a time.
3. All showed loss of control after smoking.
4. The regular nonsmokers lost most on the target after smoking.
5. After the cigars, the regular smokers lost 25 per cent on the control blank and 8 per cent on the target; the regular nonsmokers lost 20 per cent on the control blank and 13 per cent on the target.
6. Some of the subjects lost more in control and target practice than did others.

"In telegraph offices, light smokers turn out much more work than heavy smokers, and have more reserve strength for work late in the day.

"Of tobacco and the ability to work, Luther Burbank once said: 'To assist me in my work of budding —work that is as careful as watchmaking—I have a force of twenty men. . . . Some time ago, my foreman asked me if I took care to inquire into the habits of my men. I said No, whereupon he told me that these men unable to do the delicate work of budding were smokers and drinkers. I cannot entrust men who smoke even one cigar a day with my work.'

" 'Two times as many nonsmokers as smokers get on football squads after tryouts,' said Professor Pack. A loss in lung capacity of 10 per cent goes along with smoking. Wahl gave small doses of tartrate of nicotine to men working on two figure addition problems an hour a day for six days. In most cases the ability to add was reduced.

" 'I have tabulated data on 2,500 cigarette-smoking boys,' said Dr. McKeever, 'and they were sallow, sore-eyed, puny, squeaky-voiced, sickly, short-winded, and nervous.'

"Smokers do not do as well in school as do nonsmokers. Of 400 high-school boys, those who had never smoked made the best grades. The ten best

nonsmokers were 12 per cent better than the ten best smokers. (See Mendenhall, *"Tobacco."*)

"Mendenhall also shows by the comparison of 200 smoking high-school boys with 200 nonsmokers the effect of tobacco:

Low grades	18 smokers	3 nonsmokers
No promotion	79 smokers	2 nonsmokers
Poor memory	12 smokers	1 nonsmoker
Overage	19 smokers	2 nonsmokers
Slow thinkers	19 smokers	3 nonsmokers

"Another study of the grades of 500 boys showed the smokers 12 to 15 per cent lower. Among 800 boys in 16 schools, the smokers were 17 to 28 per cent below those who were free from the habit.

"Careful employers do not like to hire young smokers. They are idle more, and are not so keen-minded.

" 'The mind of a tobacco addict seems to lose the grasp of things,' says one writer.

"In a Chicago study of 2,400 smoking boys only 6 per cent were doing their work well enough to pass.

"Why should a poorer showing be made on mental and physical tests by smokers?

"This is partly due to the fact that tobacco, like all narcotics, slows down speed, reduces strength, and impairs precision of thought and motion.

"It is also due to waste of time, for one cannot work and smoke at the same time. Smokers are not as eager to do well, and do not study as hard and as long.

"The bad habits, idleness, lack of athletic ability, and low marks may result in part because the boys are lazy, and not because they use tobacco. Persons who are busy and who live an interesting life do not have to smoke. Smoking seems to appeal more to young people who are not clean, who do not have good manners, who have little will power and energy, and who cannot do well in anything.

"Whatever may be the answer, we do know that persons who use tobacco do not as a rule make good in school and on the athletic field."

Things to Do

1. Make a big growth chart for children from the age of eight or nine to the age of fifteen or sixteen.
2. Keep a record of your height and weight for a year, taking careful measurements every month on the same date.
3. Find the law of your state on selling and giving tobacco to young people. Post this law on the Bulletin Board.
4. Find in the encyclopedia a description of an ergograph, and describe how it is made and how it is used to test strength.
5. Explain in a booklet how carbon monoxide causes death,

and show that the carbon monoxide in cigarette smoke may make a smoker short of breath.

6. Make a large chart showing how much one may save in twenty years if he will save the cost of a packet of cigarettes every day, at a cost of fifteen cents a packet.

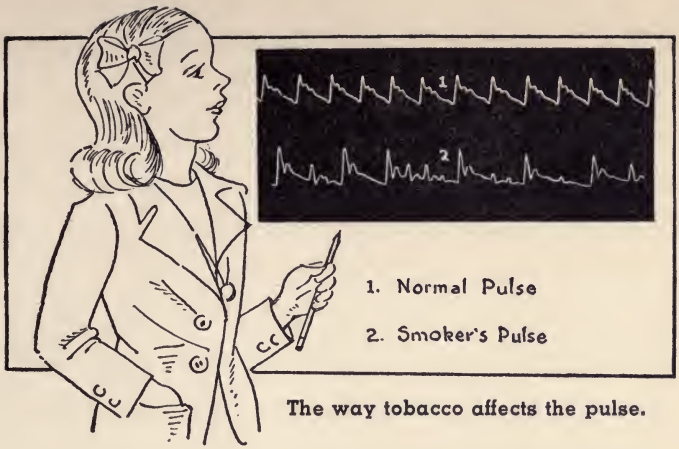
For Review and Test

1. Is there food of any kind in tobacco?
   Is any food taken into the body in smoking, chewing, or snuffing?
2. Will a person who stunts his growth ever "catch up"?
3. What does growth call for in the way of food, rest, sleep, exercise, health, and habits?
4. How does tobacco affect the user's control of his muscles? his strength?
5. Does cigarette smoking affect school grades? Explain how.

Notes on Books

Be sure to see what your books in physiology and hygiene say about tobacco and the body. Read *"Narcotics and Youth Today,"* pages 12, 15, and 102; and *"The Cigarette as a Physician Sees It,"* pages 5-19. In the latter book, pages 46-51, Dr. Kress tells about tobacco and the athlete. Then you should read *"Plain Facts"* and *"Science Speaks."*

In the *Nation,* vol. 147, pp. 151-154 (Aug. 13, 1938), is "Cigarette by Any Name," on tobacco advertising.



The way tobacco affects the pulse.

DOROTHY'S STORY

How Tobacco Affects Health and How to Quit Its Use

"CARL has told you about tobacco and growth, and how its use affects strength and ability," said Dorothy. "I shall tell of its effect on health, and of how one may quit the tobacco habit if it has been acquired. Many persons, after learning the truth about tobacco, have quit its use, to their profit in every way.

"The heart counts for a great deal on the athletic field and in the work of life. It pumps to the cells the food that gives strength, speed, and good looks.

It takes to the lungs and kidneys the wastes that must be got rid of.

"The heart is the true body motor. You know what happens if an automobile motor is out of order. It is irregular, noisy, and weak. It misses or backfires.

"A cardiograph is a picture or tracing of the beat of the heart (Latin, *cardio*, heart; and *graph*, writing or description). From it you can read that the heart of a tobacco user is weak and feeble. From the thin line and the lack of sharp beats, you wonder how it can send the blood to the muscles that need it when you bat out a ball and run in a race. The heart does not 'keep time,' either. It is 'off its beat' like an old motor.

"A committee to study the tobacco problem said: 'Great smokers rarely have a steady pulse. Sometimes it is too slow; often it beats faster than one hundred times a minute.'

"To put the effect in words you would use in speaking of a motor, 'smoking makes the resting pulse rate high, which gives a small stroke *volume* for each beat.'

"Such a heart fails to give the large capacity that hard exercise calls for. When the big demand is

made, the heart answers by a faster stroke; but, as the beat is already high, this does not send out much more blood.

"The nonsmoker's heart is slower, but has a larger output per beat, and it can more than equal the best work of the smoker's heart without pushing its rate so high.

"These poison gases are most harmful to the delicate coverings of the eye and the linings of the eyelids. They injure the optic nerve, causing 'blind spots,' and color defects result so that the smoker cannot tell red from green.

"The only way to prevent this trouble is not to smoke; the only way to cure it is to quit smoking.

"When tobacco is burned, as it must be to be smoked, several poisons flood the air. They are, as has been said, the deadly carbon monoxide, furfural (a poison gas of war), pyridine, collidine, and carbon dioxide.

"These poisons pass through the lining membranes of the mouth and nose, and huge quantities are absorbed by the square feet of surface inside the air tubes and sacs in the lungs. Many persons are made ill by breathing these poisonous fumes even when they are not guilty of forcing them into the air.

"Tobacco inflames the lining of the throat, and causes what is known as the 'cigarette cough'! Tobacco cannot be 'toasted' or 'dried' or treated in any way to protect the smoker from hoarseness and throat irritation.

"No one who wants to have a clear, strong voice will run the risk of tobacco. The best public speakers and singers will not smoke. Movie actresses in this day of the sound picture have also learned to safeguard their voices from tobacco smoke. They know, too, that tobacco kills pep, and dulls the eyes and the complexion.

"Workers in the tobacco industry risk their health. Cigar makers of the age group fifteen to twenty-four die from tuberculosis at the rate of 54.8 per cent—a higher rate than for bartenders, plumbers, glass blowers, painters, and textile workers.

"Among older workers (twenty-five to fifty-five) cigar makers are sixth from the highest in the tuberculosis death rate of a total of sixteen occupations.

"Pneumonia is another disease that attacks tobacco workers.

"In the best tobacco factories, the dust and fumes from cutting and sifting machines are drawn away

by exhaust fans, and are not breathed by the workers; when such precautions are not taken, the death rate from lung disease is high.

"Tobacco workers may be acutely poisoned by nicotine, and tobacco may produce blindness. Arsenic poisoning is a risk on account of the sprays that have been used on the growing plants.

"The drying of tobacco gives rise to dangerous gases.

" 'There is no doubt,' says an authority, 'that the tobacco industry is unsafe to health.'

"In foreign tobacco factories much of the work is done by girls. They suffer from headache, nausea, and distaste for food.

"In making snuff, the tobacco is first fermented, then ground into powder. Except in the most modern factories, snuff makers get splitting headaches, and are often nauseated.

"When tobacco leaves are steeped in water, the women workers suffer from painful blisters on their hands.

"But you say, 'I do not use tobacco. It does not hurt me.'

"It *does* hurt you, even if you do not use it.

"The tobacco habit costs this country about three

billion dollars a year. This is one and one half times what we pay out for education. It is as much as we pay for automobiles. It is more than our entire bill for ice cream, candy, and theaters.

"Fathers, and mothers too, often spend money for tobacco, when they cannot afford to. Not long ago I was in a grocery store. I saw a woman buy seventy-five cents' worth of cigarettes, a quarter of a pound of butter, and a dozen eggs.

"She paid more for tobacco than for food. The little girl who was with her looked as if she needed milk.

"People who are careless about smoking cause many fires. They flip a cigarette out of a window into dry grass or leaves, and a forest fire wipes out hundreds of acres of forest.

"Careless smokers even set fire to their own beds and their own clothes.

"The fire bill because of smokers is $30,000,000 a year. This is enough to send 30,000 young people to college every year, with all expenses paid.

"How many lives are lost from fires lighted by smokers is hard to tell.

"Automobile accidents also are caused by smokers trying to 'light up' while driving. Quite often we hear

of a gasoline tank explosion caused by a burning cigarette.

"Have you noticed the signs around service stations? They say, 'NO SMOKING.'

"How much time is lost by smokers? If an hour a day is given to the vice, this means sixty six-hour days a year, or three full school months. One would lose enough time in twelve years of smoking to get a college degree.

"Suppose at the age of twenty-one, a man began earning and saving fifty cents an hour in the time he gives to tobacco. At the age of sixty-one he would have enough to pay him a pension of $100 a month the rest of his life. If he also saved the cost of tobacco, he might have nearly twice as large an income.

"In many ways, tobacco users are thoughtless of others. The chewer spits, and in the spit are germs. They dry and float in the air to be breathed by others. Spitting is against the law because it endangers health.

"You have no doubt seen this sign; 'NO SPITTING. By order of the Board of Health.'

"The smoker puffs smoke into public rooms where nonusers must breathe it. He puts poisons into their bodies, and makes them ill.

"After you have been in a room or a car with a smoker, your hair, your clothes, and your skin reek with the smell.

"The clothes, hair, skin, hands, and breath of a tobacco user smell bad.

"In the book, '*Tobacco Taboo*,' a French scientist, Prof. Charles Richet, is quoted as saying: 'Tobacco smoke is noxious. It contains dangerous gases—oxide of carbon, hydrocyanic acid, and nicotine fumes. And yet I live in the midst of these poisons. Instead of breathing the pure, free, health-giving air, I injure my appetite, my memory, my sleep, and the action of my heart by breathing noxious vapors.'

"The tobacco habit has truly been termed a stupid slavery.

"Then why do people use it?

"Here are some of the reasons:

"1. *It is easy to get.* It can be bought from slot machines and from stores. Grownups give it to children because they think it is funny to see them get sick. Father and mother leave tobacco around where children can get it.

"2. *Most persons do not know that tobacco is dangerous.* They think it is a harmless habit, so common that they will be 'queer' if they do not 'go with the

crowd.' That they are slaves to a cruel master is unknown to them.

"3. *Many think it smart to smoke and to dip snuff.* They think it shows they are grown up and clever. This is a defense reaction they adopt because they are *weak, dull, bashful,* or *afraid.* Notice how many small men smoke big, strong pipes and long cigars. This is to cover up their small size, and to make you think they are big and strong.

"4. *It makes money for some persons.* Men who grow, manufacture, and sell tobacco want others to use it, for the sales make money for them. They are the people who urge children to 'try it once' for the profit there is in it for them.

"5. *Tobacco is a habit-forming drug.* If it gets you in its clutches, it is hard to break away. It is like other narcotics—opium, morphine, and alcohol.

"6. *Advertisers fool people about tobacco.* Women and girls have been told that cigarettes will keep them thin. What are the results? The tuberculosis rate has gone up higher than ever among girls fifteen to nineteen and among women twenty to thirty-four years old.

"*The Journal of the American Medical Association* says: 'To the claim that cigarettes do not cut

the wind, impair the health, or satisfy the longing for things that make you fat without interfering with your appetite for healthy foods, the answer is, "Hooey." '

"Uncle Sam has forced tobacco advertisers to admit they told a falsehood when they claimed that tobacco could keep women underweight without harming them.

"Investigators also said that tobacco advertisers put out testimonials from persons who do not use tobacco at all. They pay actresses for statements that cigarettes keep them slender, when the actresses do not smoke.

"Here is a bit of good advice: 'When reading or hearing an advertisement that a drink or a drug or tobacco is good for the health, or harmless, or will keep you thin, or make you beautiful, or build up your muscle, the best thing to do is not to believe it.'

"*Remember*, the label on the bottle or the package can't tell what the effects of the contents will be on you.

"Suppose a person says to you, 'I am a tobacco addict; how can I quit?'

"The best way to quit is just to quit!

"There is a fine story for boys and girls called—

" 'THE LITTLE SHEPHERD OF KINGDOM COME

" 'His name was Chad Buford. When a little boy, up in the mountains, he was taught to chew tobacco.

" 'When he was about twelve years old, he went down to the Bluegrass country to see his grandfather. As they sat before the big fireplace after dinner, Chad took a chew.

" ' "I'd think you'd be afraid tobacco would keep you from growing," said his grandfather.

" ' "Do you mean a boy who uses tobacco won't grow?" asked Chad.

" ' "That's just what I do mean," said Grandfather Buford.

" 'Chad took the quid of tobacco out of his mouth, and threw it in the fire.

" ' "Are you going to quit?" asked his grandfather.

" ' "You bet I am," said Chad. "I won't do anything that may make me a runt." '

"This is a good way to quit any bad habit; but some persons do not have the will power that Chad had. They may find it easier to quit by taking a little less tobacco every day. This is true for those who are weak and afraid to stand on their own feet.

"After one has made up his mind to quit, there are some things he can do to help.

"*Keep busy.* Plenty of good hard work and exercise make one sweat and get rid of the poisons. They keep him from getting nervous and bored, and make him forget tobacco.

"*Keep away from bad company* and from persons who will try to get you to use tobacco.

"*Take a good hot bath* every night before going to bed.

"*Eat good food.* Put fresh fruit, fruit juices, leafy green vegetables, milk, butter, and cooked cereals on your menu. Drink plenty of water, and stop using tea and coffee. When you feel as if you wanted a cigarette, a cigar, or a chew, eat a piece of candy or drink some fruit juice.

"Something can be put in the tobacco addict's coffee that will make him sick; but it won't cure him of the tobacco habit.

"Years ago, a tobacco company urged women to smoke a cigarette instead of eating a sweet.

"Today, health teachers say to you, 'Reach for a sweet instead of a cigarette.'

"Don't be fussed because someone tells you it makes a man or a lady out of you to smoke.

"It is not manly or ladylike to be weak, nervous, touchy, dull, and unhealthy. It is not manly or ladylike to have bad breath, discolored teeth, and smelly hands.

"I have now told you how tobacco affects the body," said Dorothy.

"It reduces growth, impairs speed and strength of mind and body, and causes illness. It is hard on the heart.

"Tobacco workers and users are more likely to have lung and throat troubles than are nonusers.

"Tobacco causes shortness of breath. Athletes are not allowed to smoke.

"The tobacco user hurts others. He sets fires, poisons the air, and spits on the sidewalk and street. He scatters ashes on the rugs and dishes, and into the air.

"He spends money for tobacco that could be spent for food, clothes, candy, ice cream, education, cars, and good homes.

"The way to quit is to quit! Good food and a busy life will help. The tobacco addict does not have to be sent to jail to break the habit, as does the dope user. He can free himself."

Things to Do

1. Put on a big poster all the good ideas you can find on "How to Form a Habit" and "How to Quit a Habit."
2. Make a poster on which you show persons in those lines of work who would be most hurt by tobacco—singers, actresses, radio announcers, public speakers. You can cut their pictures from magazines and put them on the poster.
3. On a chart for the Bulletin Board show several better ways to spend the thirty million dollars lost every year from fires lighted by cigarettes.
4. Make a survey of your community, and list all the places where you see "No Smoking" and "No Spitting" signs. Why are those signs put up—fire danger? health? regard for others?
5. Prepare for the Bulletin Board a list of ways in which the tobacco user can show courtesy for other people.

For Review and Test

1. How does tobacco affect the heart and its work?
2. In what ways do tobacco users show they are selfish?
3. Tell how a tobacco user may quit.
4. In what ways is chewing a worse habit than smoking?
5. How do young people start the tobacco habit? Why?

Notes on Books

Dr. Kress, in *"The Cigarette as a Physician Sees It,"* gives advice in his last chapter on quitting tobacco. On pages 81-85 in *"Science Speaks"* the effect of tobacco on the heart is described; and the last chapter, a good one, is "Why I Do Not Smoke." Look for other facts in your schoolbooks.