N WATER MANAGEMENT PROJECT

PUBLIC EDUCATION

A TRAINING MANUAL

BY

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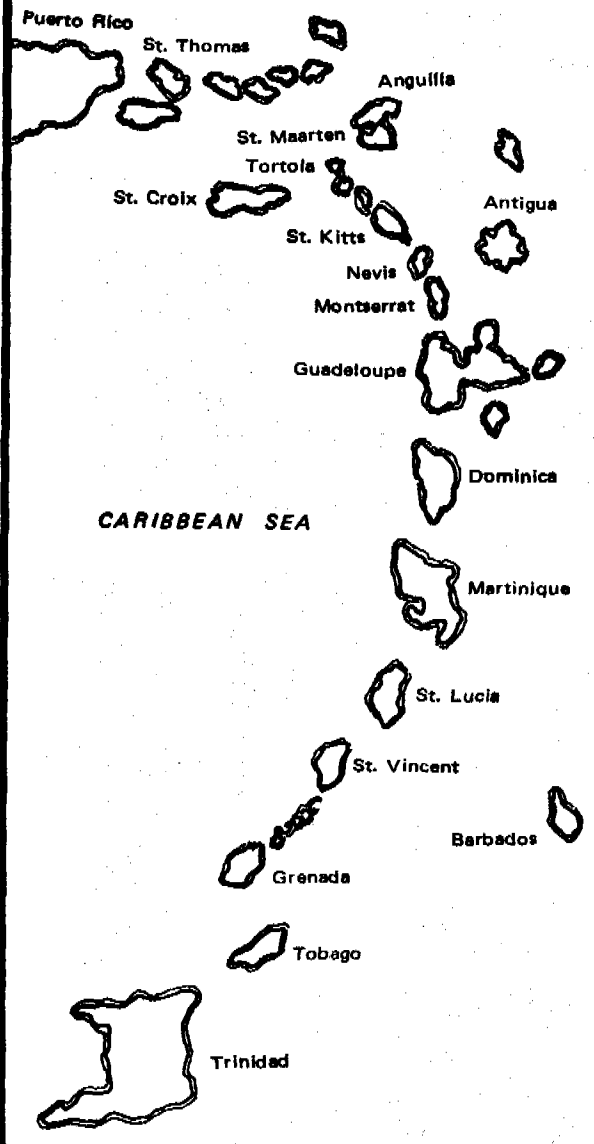

A JOINT-VENTURE PROJECT OF THE GOVERNMENTS OF:

ANGUILLA, ANTIGUA, BRITISH VIRGIN ISLANDS, BARBADOS,
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AND

THE PAN AMERICAN HEALTH ORGANIZATION

NOV. 1979

CARIBBEAN BASIN WATER MANAGEMENT PROJECT

PUBLIC EDUCATION

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PREFACE

Every water utility needs to educate the public. It is important that consumers understand that water is more necessary than electricity and telephone in the home. It is vital because without water man cannot live.

The water utility knows, of course, that the flow of water so casually accepted by consumers is no happy accident. It is a result of good planning and hard work which should be a source of interest and pride to all. Unfortunately, the public tends to think of the water supply only when something goes wrong.

We believe that an often overlooked responsibility of the water utility is education of the public in regard to the uses and misuses of water. It is our purpose, therefore, to help utilities bring the story of water to the public. By providing the resource and reference materials, we hope to make it easier for the water utilities to meet and work with consumers.

The Public Relations Officer or others who are asked to help educate the public can use this manual in several ways. The person making the presentation will find the material easily adaptable and suitable to a variety of situations -- secondary school classrooms, meetings of business men, public health workers, teachers, P.T.A's etc. or in collaboration with various community action groups. In some instances it may be possible for the Public Relations Officer to give a series of five lectures, each one based on the information in the accompanying five chapters.

It should be noted, however, that no one chapter needs to precede another. Each can stand on its own and thus the instructor should be guided by his audience and their needs and interests when selecting a topic for presentation.

Some water utilities may wish to duplicate pages from this manual for distribution to the public. Some of the material may also be used as the basis for educational press releases to be distributed to local newspapers and radio stations.

WHERE TO GET MORE INFORMATION

This manual is one of many being developed by the Caribbean Basin Water Management Project to improve the performance of personnel in the water utilities of the Eastern Caribbean. Manuals will be developed in many aspects of water utility operation, maintenance, and administration. For more details on manual availability and other aspects of this project, contact:

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INTRODUCTION

The purpose of this handbook is to provide information about water services and water utilities. The material is presented in such a way that a member of the water utility wishing to make a presentation to the public about some phase of the water business, can find a good selection of suitable material in each chapter. Overhead transparencies can be made from the many illustrations included, in order to further illuminate the presentation. Each chapter is organized into three main sections.

PART A is an outline of the chapter's contents and can be used as a guide by the Public Relations Officer who intends to make his own speech or presentation.

PART B, Suggested Content, consists of several pages of written material with graphics. It may be used as a ready-made speech or it may be copied and distributed as reading material for the public.

PART C of each chapter is a series of discussion questions. The Public Relations Officer will find these particularly useful in classroom situations. The questions are a good means of checking to see if the audience/students have understood the points he has made during the speech. The questions have also been devised to serve as a point of departure for further discussions which may increase the students' interest in the story of water.

The Public Relations Officer may also be interested in showing commercial films or locally produced slide shows in conjunction with his oral presentation. The following is a list of some appropriate films. They may be ordered through the office of the Training Coordinator in the Barbados Waterworks Department. Several months notice should be given in order to ensure their availability on the requested date.

AVAILABLE FILMS

F.121 DRIP. Produced by Stuart Finley, Inc. (20 minutes. colour, 16-mm)

The star of this entertaining film is Miss Drip, Lady water wastrel. "Water saving and waste reduction" is the theme of this dramatization.

F.131 MY WORLD ... WATER. Produced by Churchill Films (12 minutes, colour, 16-mm)

An experimental film on the wonders of water, its origin, uses and pleasures. Children suggest the social implications of using and wasting water and ways to conserve.

F.109 SILENT TOAST OF WATER, A. Produced by the American Waterworks Association, 1975. (15 minutes, colour, 16-mm)

This motion picture traces the history of water treatment and describes the role of the water utility.

F.119 WATER FOLLIES: A SOAK OPERA. Produced by the Denver Water Board, 1975. (7 minutes, colour, 16-mm).

Cartoon characters involved in many funny routines, all showing water waste. Message: Don't Waste Water.

F.103 GROUND WATER: THE HIDDEN RESERVOIR. Produced by the Ground Water Council, 1971. (19 minutes, colour, 16-mm)

A presentation of the hydrological cycle and the underground water tables it creates. By showing the natural cycle, the makers present a clear picture of what constitutes water supply and how this may be tapped naturally (artesian wells, springs, geisers) or artifically (wells, man-made reservoirs), including the threat of salt water penetration to coastal reservoirs if natural water supplies are overtaxed.

CHAPTER

WHERE YOUR WATER COMES FROM

CHAPTER OBJECTIVES: Participant will understand where pipe-bourne water comes from and will be able to discuss:

1) The hydrological cycle,
2) Water sources, and
3) Factors affecting the selection of a water source.

PRESENTATION OUTLINE:

I. The hydrological cycle

II. Water Sources
   - A. Surface Water
   - B. Ground Water

III. Selecting a water source
   - A. Supply and Demand
   - B. Contaminants and Need for Treatment

NOTE TO THE INSTRUCTOR

This presentation may be made more meaningful to your listeners if it is accompanied by your own slide show illustrating the water sources, treatment facilities and typical water uses on your island. It is suggested that you prepare such a slide presentation to accompany your oral presentation.

MAGIC, LUCK, OR KNOWLEDGE

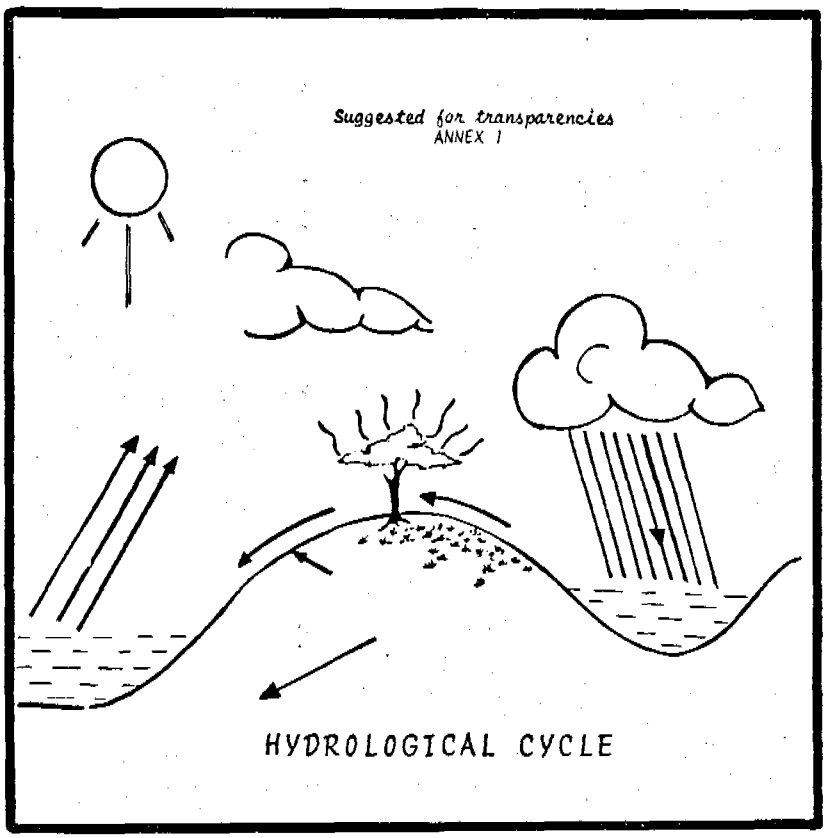
Not so long ago a child asked his older brother how the rain got from the sky into the tap at the back of his house. The older brother laughed. "Magic" he said, and he ran off to play.

Later, the curious child asked his sister why water was still coming out of the tap even though the rain hadn't put any there for three days. The older sister, busy in the way that older sisters after are, smiled. "Luck", she replied, and went off to gaze at the sunset.

The small boy grew and the rain continued to be magic -- it continued to run clear and fresh from the tap in the back of his house and then, one day the child's belief in the magic of the rain was shaken. A voice on the radio explained, "The water utility announces that water will be shut off today while new pipes are being laid." Suddenly the child understood. The rain was not magic, the water utility was! Rather than magic wands, the water utility had magic pipes. How wonderful it all was that the magic water utility could make the rain go into the pipes and o out of his faucet.

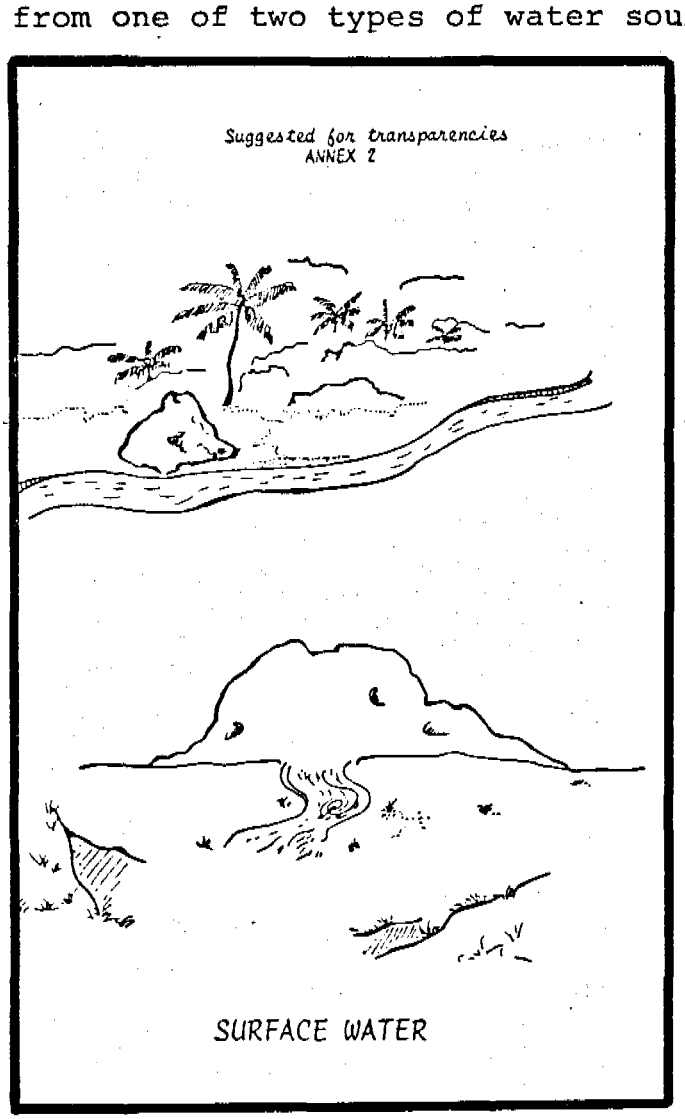
THE HYDROLOGICAL CYCLE

We know, of course, that the child was wrong about the water utility being magic. He was right, however, about our water coming from rain. There would be no water in the pipes without the hydrological cycle. The hydrological cycle is the term used to define the process by which water is taken up, formed into clouds and released to earth again as rain.



This is what happens. The heat in the air causes water to evaporate from the surface of the land, from oceans, lakes, rivers and streams. You cannot see the water when it evaporates, for it is water vapour, a gas, and it rises and collects to form clouds.

Knowing about the hydrological cycle, however, still does not tell us all we need to know to answer the question, "Where does our water come from?" It is true that some people catch rain water for their daily use. But what about the water that runs through the pipes to homes and industries, to hotels and standpipes, to hospitals and stores? The water utility must find a water source, ensure that the water is pure and safe and pump it along distribution pipes to all of these places. How does the Water Utility select a water source? It is not magic or luck. Water engineers choose from one of two types of water sources.



SURFACE WATER

Surface water is water found in oceans, rivers, lakes and streams. Ocean water is, of course, too salty to be used, so the water utility looks only at fresh or non-salty water sources. Even fresh water is not always useful, at first. Remember that water gets into the river, stream or lake by flowing downhill over mountains and collecting to form the rivers, streams, or lakes.

The water flowing down on heavily vegetated land is likely to pick up a lot of bacteria. Bacteria in the water supply may affect the taste, colour and odour of the water. Similarly, when the water has run off agricultural lands, it is possible that it can be contaminated with pesticides. If the stream has been used by people for bathing and washing, the surface water may contain disease-causing germs and chemical detergents.

When a water utility chooses surface water as its water source, it usually must add certain chemicals to the water to make sure that the water is no longer contaminated, that it is safe and pure. Twigs, leaves, stones etc. must also be screened out. If your island has a dam on a river, it is likely that the dam serves as a method of trapping the river water so that it can be treated and pumped to all the water consumers.

GROUND WATER

On some islands, the water utility can use ground water as its water source. Ground water is found below the surface of the ground. It is water which has filtered down through the soil, rock or coral to form huge underground rivers and lakes. Even though ground water may be thousands of years old, it is usually clean and cool. Water utilities or private individuals who drill wells are digging down to the ground water and pumping the water back to the surface of the land.

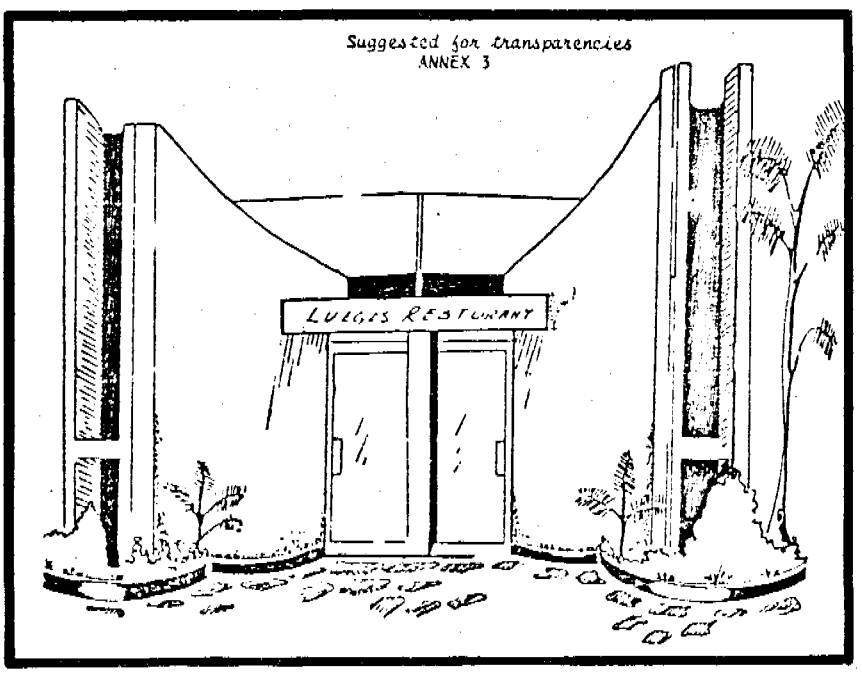
CHOOSING A WATER SOURCE

Before the water utility chooses the water source or sources for the water you use, they have to answer two questions. First, is there enough water there to supply all the needs of the people? and secondly, can this water be treated to make it pure and safe?

Engineers at the water utility have calculated the average daily water consumption of your island. They know, for example, that more water will be used during the dry season; that more water is generally used in the home around meal-time or just before bed time. The water utility considers the various types of water uses and then decides if a proposed water source can satisfactorily meet the need for water in that area.

Think about all the uses of water on your island. Here is a partial list:

DOMESTIC USES	INDUSTRIAL AND COMMERCIAL USES
drinking	factories
cooking	restaurants
washing	hotels and ports



DOMESTIC USES (cont'd)

Bathing

Flushing toilets

Watering gardens

PUBLIC USES

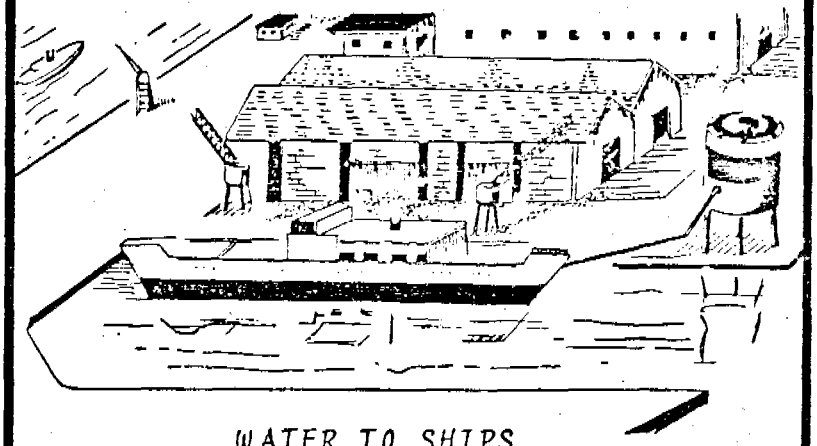
Fire-fighting

Street cleaning

Stand pipes

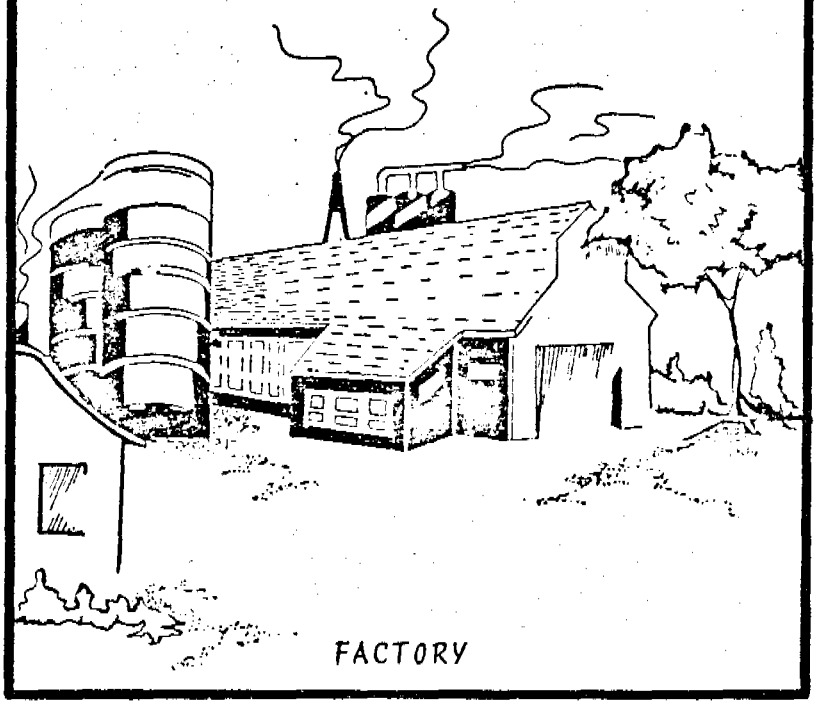
Public bathrooms

Suggested for transparencies
ANNEX



WATER TO SHIPS

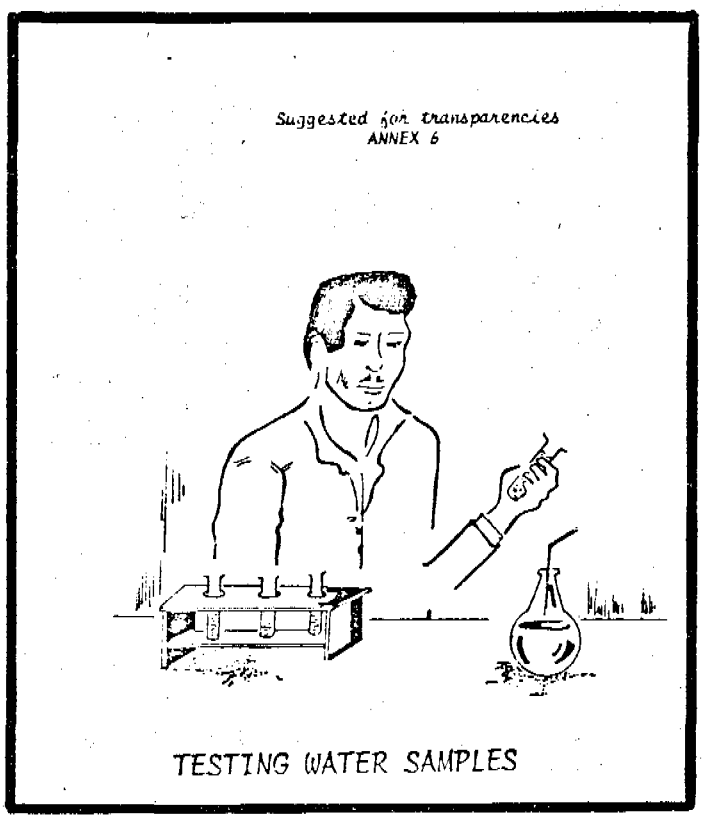
Suggested for transparencies
ANNEX 5



FACTORY

NEED FOR WATER TREATMENT

Another factor in the selection of a water source is the amount of treatment necessary to make the water safe. If the water utility uses surface water, it is likely that the water is treated at a water treatment plant. There, chlorine and copper sulphate may be added to control the grassy, earthy or fishy taste and odour caused by the presence of algae or decaying vegetation in the water.



TESTING WATER SAMPLES

The treatment plant operator tests samples of water frequently in order to determine what treatment is necessary. He knows, for example, that if too many chlorides are present, the water will taste salty and may corrode the pipes. He knows that if the water contains too much iron, it may stain clothing and plumbing fixtures and spoil the taste of beverages. At the treatment plant, the water may also have to be passed through a carbon filter to ensure that it is free of an unpleasant taste.

SUMMARY

As the curious child suspected, the water running from the tap does come from rain. But it does not flow because of magic or luck. The water comes from a surface or ground source carefully selected by the water utility and sent to your home only after men at the treatment plant make certain that it is safe, fresh and pure.

CHAPTER DISCUSSION QUESTIONS

1. Compare evaporation and rainfall.
2. Does the water on your island come from a ground source, a surface source, or both?
3. When the water utility looks for a water source, what are some of their considerations in selecting the site?
4. Mention some of the activities which involve the use of water. How much water do you think is used by each activity?
5. Why is surface water treated at a treatment plant?

CHAPTER 2

HOW WATER GETS TO YOU

OBJECTIVE: Participants will understand the purpose of a water distribution system and gain some knowledge about:

1) Trunk and distribution mains
2) Fire hydrants
3) Storage tanks and
4) Water meters.

PRESENTATION OUTLINE

The Distribution System

I. Mains
   (a) Trunk
   (b) Distribution
   (c) Size and capacity
   (d) Maintenance
II. Fire Hydrants
III. Storage Tanks
IV. Water Meters

NOTE TO THE INSTRUCTOR:

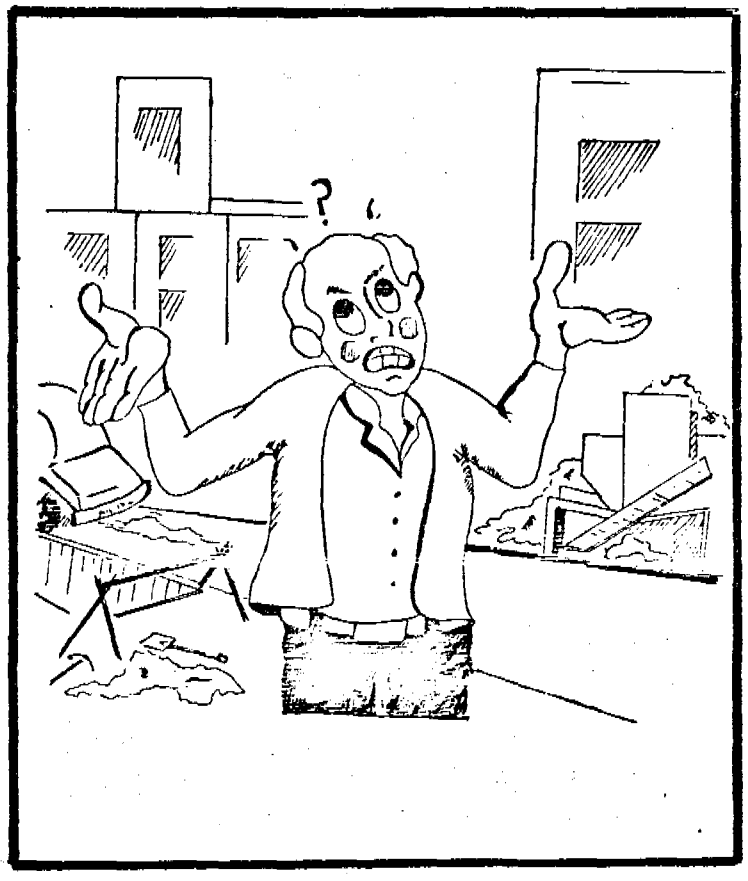
This presentation can be made more meaningful to your listeners if it is accompanied by your own slides illustrating the flow of water from intake to tap in your water system. It is suggested that you prepare such a slide presentation to accompany your oral presentation.

SUGGESTED CONTENT

Why? Why? Why?

You are walking, riding or driving down a road. The sky is blue, the sun warm. Birds can be heard calling to one another. Blossoms decorate the trees. A fine day, indeed.

Then suddenly, as you round a bend, your peace and goodwill are shattered. Ahead are men and noisy machines, piles of dirt and rubble. Traffic is stalled and the pleasant warmth of the day now becomes stifling hot. Sweat rolls down your brow as you gaze at the road. On one side of the road traffic manoevres slowly around the "MEN WORKING" signs. Under your breath you growl, "They're at it again." Your voice rises, "Why? Why? Why?" And with some of the pleasantness gone from your day, you continue your journey pondering that eternal, "Why?".



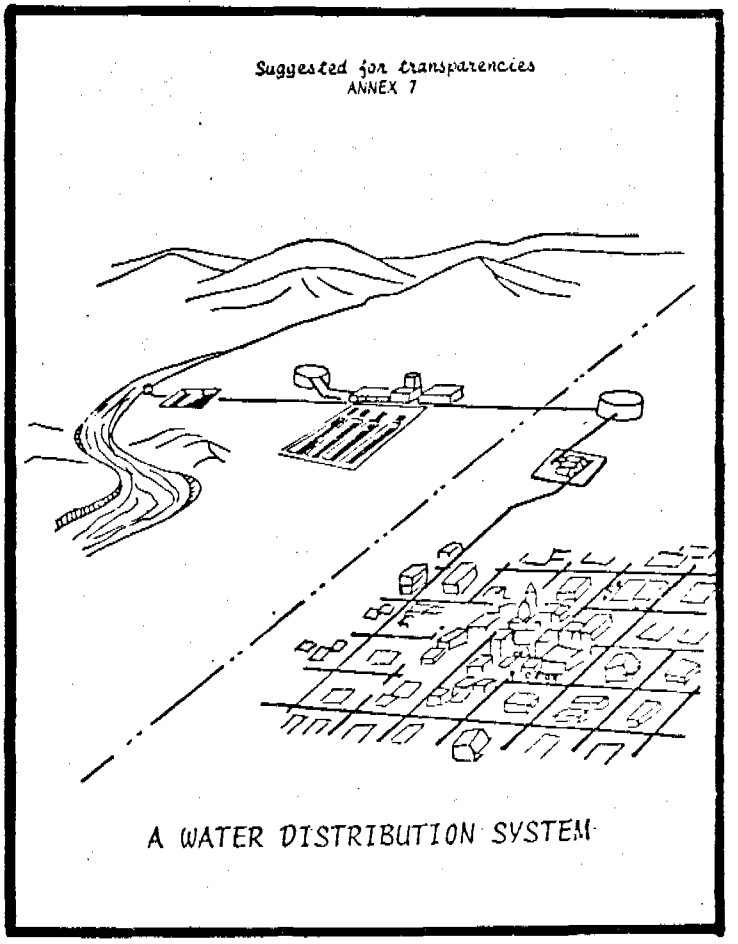
Here are some possible answers. Check the ones you think appropriately answer the question, "Why is someone messing up the road again?"

1. Someone is searching for buried treasure.
2. Someone is making a dirt collection.
3. Someone is putting in underground pipes for some reason.
4. Someone enjoys making noise and messes.
5. Someone is repairing something that is already in the ground.
6. Someone is testing or inspecting something in the ground.
7. Someone is about to build a narrow but long skyscraper on that side of the road.
8. Someone is looking for the lost continent of Atlantis.

All of the above answers may possibly be correct, but if your water utility has done the excavation, then you may have checked answers 3, 5 or 6. That trench is a sign of action -- a sign that the water utility is at work upgrading services for you, the consumer. The inconvenience on the road will last only a short time but the convenience of fresh, flowing pure water will be yours for a life-time.

THE DISTRIBUTION SYSTEM

The water that flows from your faucet arrives at that tap through pipes called mains. The mains, as you are reminded when you see a road being excavated, are placed underground to ensure that they are not easily damaged. Throughout your city or village, is a complex system of mains running from the water source through a maze of pipes until it reaches your faucet. Designing, installing, operating and maintaining this distribution system is a major job. It is done for you by your public water utility.



A WATER DISTRIBUTION SYSTEM

MAINS

The distribution system includes mains, fire hydrants, storage tanks and meters. There are two types of mains,

1) Arterial mains and
2) Distribution mains.

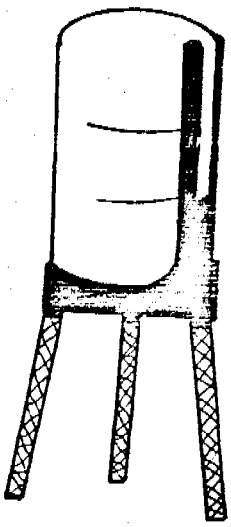
Arterial mains deliver large quantities of water to the distribution mains which go out from the trunk main. The distribution mains then deliver water to fire hydrants and the individual service connections leading to each customer.

Both types of mains must be large enough to supply the growing demand for water many years after installation. Water engineers calculate the producted population growth, industrial expansion, fire requirements, and commercial requirements before determining the size and number of mains necessary in your area. Consequently, some of the excavation you see may be for the laying of larger mains which should be adequate for the next 50 years.

Mains are made of material resistant to corrosion and deterioration which will not affect the taste or quality of your water. Nevertheless, the water utility has an active maintenance programme and is constantly alert to signs of leakage or breakage. That excavation on the road, therefore, could also be for the purpose of finding and/or repairing leaks in the distribution system. No one, including the water utility can afford to waste water.

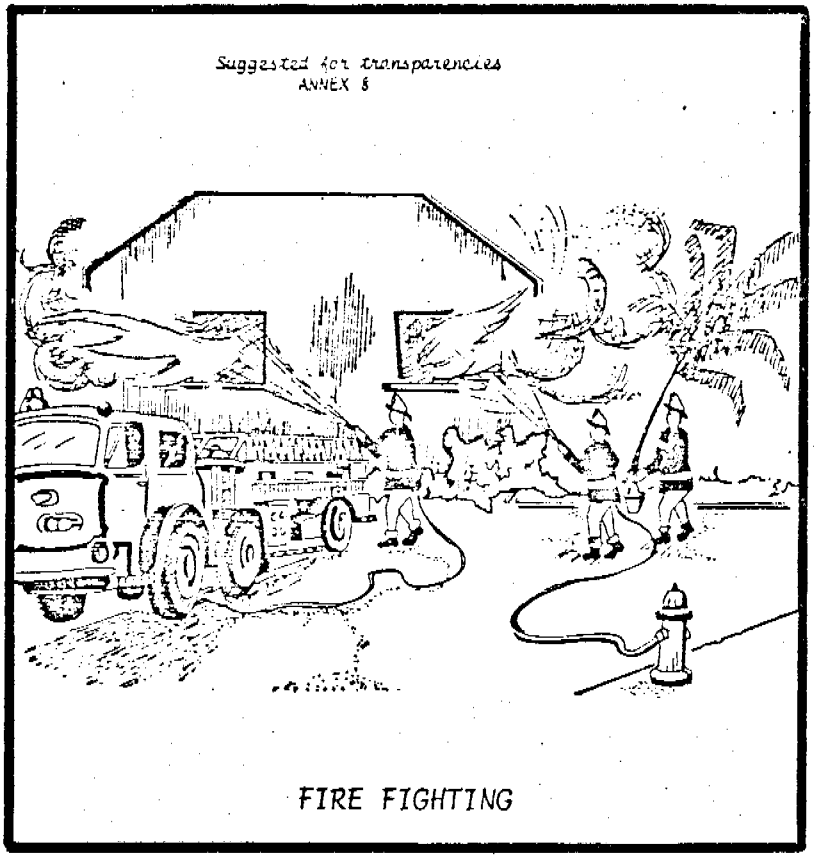
STORAGE TANKS

The storage tanks you may see on the skyline are also part of the distribution system. Because there are more demands for water at certain times of the day, the distribution system must be capable of meeting these peak load periods. Some of the extra water needed during peak load times comes



A STORAGE TANK ON A SKYLINE

from storage tanks where it had been stored during an earlier low-use period. For example, at night the demand for water is lower than during the day. The system is still capable of delivering large quantities of water, however, because this water is in excess of the night time needs, it can be stored in tanks to be distributed the following day during the peak-load periods.



FIRE FIGHTING

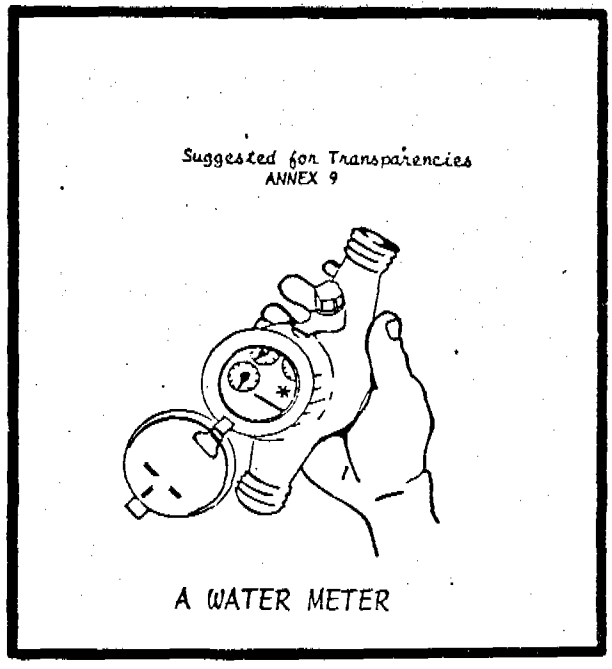
FIRE HYDRANTS

Hydrants are the faucets of the fire protection system. The number and placement of hydrants required to give adequate protection varies depending on the area. Water engineers determine how many gallons per minute must flow from the hydrant if it is to be an effective fire-fighting tool. They allow for this when they plan your water distribution system.

WATER METERS

Meters are mechanical devices which measure and register the volume of water passing through them. Meters are used by the water utility to measure the amount of water actually sent out to the distribution system.

In some areas, consumers also have meters in their homes. These show how much water the consumer uses and they then pay only for this amount. Such meters, and the charges based on metered consumption can discourage the wastage of water and ensure that all users pay their fair share.



A WATER METER

SUMMARY

Good water pressure is not just an accident. It is dependent on a well designed, well maintained, and efficiently operated distribution system. Occasional traffic inconveniences are a small price to pay for the privilege of having running water at your fingertips. And that is "WHY , WHY, WHY".

CHAPTER DISCUSSION QUESTIONS

1. There are two kinds of mains in the distribution system. Why is this necessary and how do they differ?
2. Does the placement of underground water mains seem a help or a hindrance to you? Discuss.
3. What are some of the things that engineers consider when they design a distribution system?
4. Are there storage tanks in your area? What role do they play in the distribution system?
5. Do you think customer water meters are a good idea? Why or why not?

CHAPTER 3 WATER CONSERVATION

OBJECTIVE: The participant will become aware of both the importance of water in daily life and need to conserve water. The participant will show this awareness by recognizing wasteful practices and recommending methods of using water wisely.

PRESENTATION OUTLINE:

I Examples of water-wasting practices

II Description of draught conditions and their relation to lack of water conservation.

III Examples of water conservation practices. (see page 28).

NOTE TO THE INSTRUCTOR:

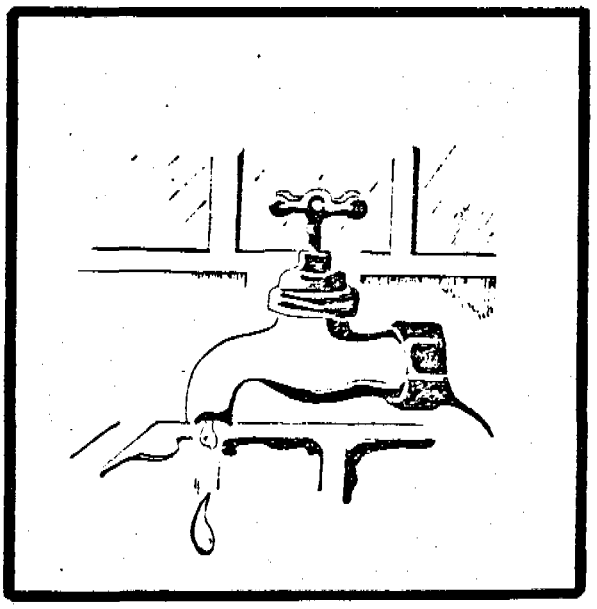
This presentation can be made more meaningful to your listeners if they see visual examples of common wasteful habits. It is suggested that you search out authentic scenes of water being wasted or stage some examples which you can photograph for a slide show. Good water conservation habits should also be illustrated.

SUGGESTED CONTENT:

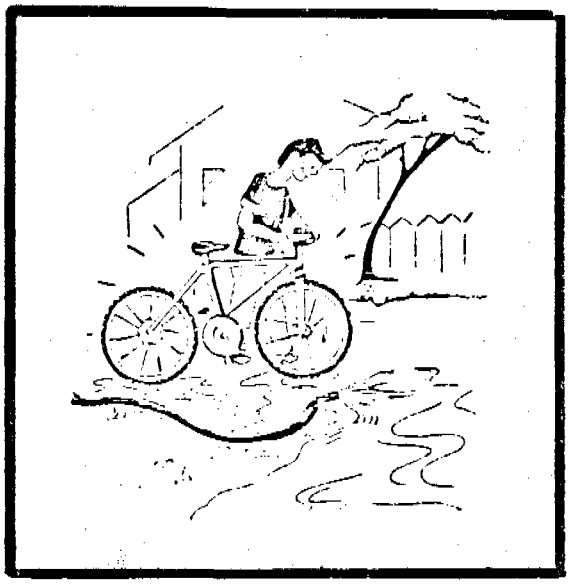
THE LAND OF GRUMBLES

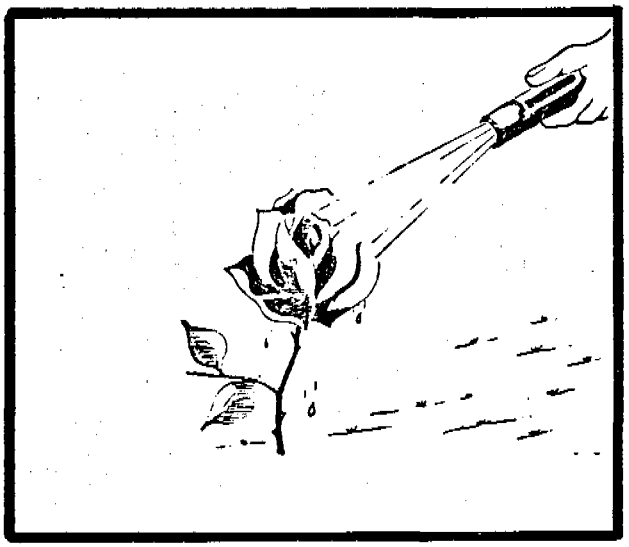
Long ago, in a far away place, lived a happy and prosperous people who laughed and played and worked and loved with never a care in the world. There were fish in the sea and fruit on the trees and water flowed freely through the pipes across the land. The people loved sunshine and rejoiced in their good fortune when they had months of clear skies without a drop of rain to spoil their pleasure.

When the rainy season didn't come as expected, the light-hearted people didn't mind, for the water still ran freely from the taps. In fact, it dripped constantly from most household taps. The people liked the musical sound of the splashing water as it ran uselessly down the drain. It ran all day and night from stand pipes and the people saw no reason to turn it off when surely, someone would soon pass by who wanted to use it. It ran from hoses flooding fields -- sometimes for several days when the farmer was busy enjoying life.



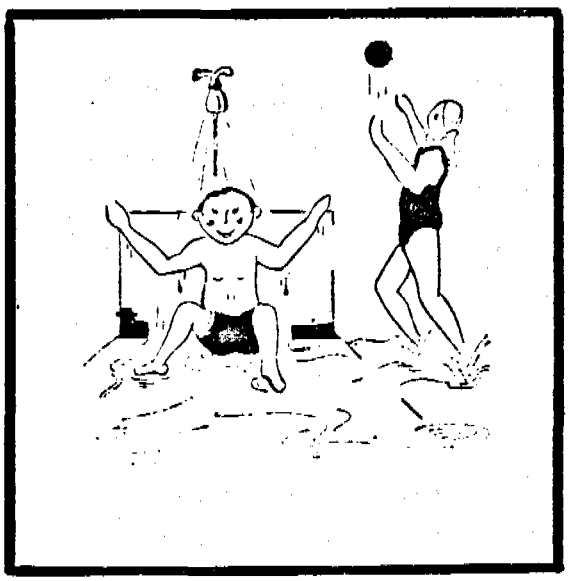
Still, the fields grew browner and the breadfruit were smaller and the flowers less colourful and the rain didn't come. The people continued to wash and rinse clothes under running taps, they continued to fill basins to overflowing when they needed to wash a few dishes, they continued to take great pride in their shiny bikes and so they





washed them lovingly under a hose for hours at a time. The gardeners among the people continued to sprinkle large areas of ground in the hope of watering one withering rose bush.

The children continued to play and cool off under the sparkling fresh water running freely at the standpipes.



But then, one sunny Tuesday, the sparkling fresh water stopped flowing completely. People hit the taps and kicked the standpipes and shook their hoses -- but still the water wouldn't come. Most of the people remained happy and joyous for the first five and a half hours but then, a strange sound began to be heard in that carefree land. It was grumbling.

Mothers grumbled that their children were thirsty. Wives grumbled that their sticky, unwashed dishes were attracting ants and roaches. Babies cried because they were hot and uncomfortable and beginning to suffer from heat rash. On the third day, the men grumbled about the unappetizing food that was being prepared for them without water. Teachers complained that schools couldn't stay open unless toilets were made to flush. Merchants complained that all their bottled drinks had been sold and they could get no more. The grumbling people had to have the drinks without ice, of course! Factory owners complained because they could produce no more drinks without their main ingredient, water. Farmers complained that their cows produced little milk and that their crops were withering and dying.

No more were laughter and singing and the sounds of joy heard. The people grew gaunt and sickly and the vegetation darkened and died and the land was parched and silent.

Several terrifying and deathly weeks passed and then a sound, familiar so long ago, was heard by a few of the sad and bewildered people. It was the ping and the pang and the pung of raindrops falling gently on the roof-tops of their unhappy land. It only rained a little that day -- some people only collected a cupful, but they cherished that life-giving cupful and when a bit of rain fell the following day they were prepared to catch more. Weeks passed, the rains were not heavy but each day the sky gave the grateful people a little -- sometimes as much as a gallon per person.

The grumbling ceased and in its place came words of wisdom. Throughout the land exhortations could be heard, "Take care of that water! It is a gift to be cherished."

When the people of this far away place had learned many lessons about conserving water, the much delayed rainy season arrived with a fury. Once again the streams were full and water began to gurgle from the long unused taps.

Some of the vegetation returned to normal but the sounds of the far away country were never again the same. The wise people refused to listen to dripping faucets and long-running taps. They came to hate the sound of water being wasted. The people laughed and sang once again, but now their joyous noises were accompanied by a wise and important sound. In the background were always words such as these:

- DON'T LET WATER RUN THROUGH DRIPPING TAPS, LEAKING TANKS AND PIPES OR THROUGH FAULTY VALVES AND OVERFLOW PIPES.

- DON'T WASH UNDER A RUNNING TAP. PUT A PLUG IN AND FILL THE WASH-BOWL WITH ONLY ENOUGH WATER TO DO THE JOB.

- USE A MUG OR GLASS OF WATER FOR CLEANING TEETH, BY RUNNING A TAP YOU USE FOUR TIMES MORE WATER THAN YOU NEED.

- DON'T LET THE FAUCET RUN IN ORDER TO GET A COLD DRINK OF WATER. KEEP WATER IN THE REFRIGERATOR.

- DON'T USE THE TOILET TO FLUSH AWAY TISSUES, CHEWING GUM ETC. EVERY FLUSH TAKES FIVE TO SEVEN GALLONS OF WATER.

- USE A BUCKET FOR WASHING YOUR CAR AND RINSE DOWN WITH HOSE.

- HAVE ANY FAULT IN A WATER LINE REPAIRED AT ONCE. DON'T WASTE TIME OR WATER.

- THE WATER AUTHORITY WILL CHECK LEAKS AND MAY REPAIR THEM FOR A SMALL FEE SO IF IN DOUBT, ASK THEM FIRST BEFORE CALLING A PLUMBER.

- DON'T OVERFILL KETTLES WHEN BOILING WATER.

- WHERE POSSIBLE COLLECT RAIN WATER TO WATER THE GARDEN.

CHAPTER DISCUSSION QUESTIONS

1. Point out some of the wasteful habits the people of this far away land practiced before the drought.
2. Have you seen wasteful practices around your area? Why do you think some people waste water?
3. Discuss methods of conserving water.
4. Should people conserve water during the rainy season? Why?

CHAPTER 4

WHY WE NEED SAFE WATER

OBJECTIVE:

Participants will understand the relationship between pure water and good health. They will also be able to articulate their rights and responsibilities in regard to attaining safe water.

PRESENTATION OUTLINE:

I Introduction stressing the fact that people have a right to safe and pure water.

II Pure and adequate water and its relation to good health.

III Examples of disease transmitted by contaminated water and diseases associated with dirt.

IV The responsibility for pure water.

A. The water utility's responsibilities

1. sedimentation
2. filtration
3. chlorination

B. The Public's responsibilities

1. Respect for and care of the watershed area.
2. Careful handling of water and water facilities
3. Careful personal hygiene.

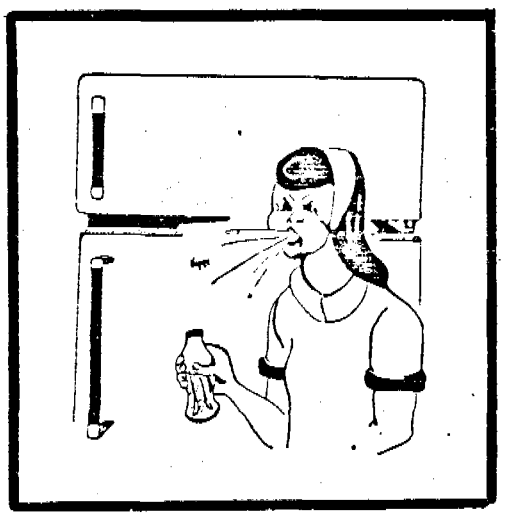
NOTE TO THE INSTRUCTOR:

This presentation may be made more meaningful to your listeners if it is accompanied by your own slides illustrating pertinent points from the presentation. Examples of unsanitary personal habits which might lead to water contamination would emphasize the section dealing with the public's responsibilities to maintain a pure water supply. Likewise, slides showing sedimentation, filtration and chlorination might make that section more meaningful to your audience.

DO YOU GET WHAT YOU DESERVE?

Your Rights and Responsibilities

Hot and thirsty, Mary pries off the cap from her favorite soft drink. As the cool liquid starts down her parched throat, she feels the unmistakable crunchiness of an insect. She spits out the drink in alarm and fury. She is angry! As a customer, she has a <u>right</u> to safe and pure food and drinks.



Charlie comes home after a long hard day. He goes to the refrigerator to find a cold beer. As he pours, he notices that rather than a clear amber liquid, the beer is a cloudy dull colour. He is angry!!'As a customer, he has a <u>right</u> to safe and pure food and drinks.

The following week, both Mary and Charlie find that only a little water is running from their taps and it is rust-coloured and tastes slightly of iron. They are <u>NOT</u> angry. They haven't realized that water, too, is a product and that as consumers, they have a <u>right</u> to safe and pure water.

As members of the public we should be concerned with the quality of our water. We must realize that safe and adequate supplies of water constitute an important measure for the protection and improvement of health.

PURE WATER AND HEALTH

The connection between pure water and health is a very close one. The list of diseases that are favoured by lack of clean water is long. It comprises diseases transmitted by contaminated water as well as diseases associated with dirt. A plentiful supply of good water conveniently available makes cleanliness possible, both personal and in the environment, and so plays an important port in the prevention of many diseases. The list includes:

ACUTE BACTERIAL CONJUNCTIVITIS

Personal cleanliness helps to prevent it. Widespread seasonal epidemics where hygiene is poor.

AMOEBIC DYSENTERY:

Transmitted by contaminated water, vegetables washed in such water, etc. In badly sanitated areas 50% of people are often infected.

ANKYLOSTOMIASIS (HOOKWORM DISEASE):

Preventive measures include proper waste disposal and cleanliness. Widely endemic in warm countries.

ASCARIASIS:

Proper waste disposal and personal cleanliness prevent this widespread worm infection. In tropical countries, over 50% of people may have it.

BACILLARY DYSENTERY:

Lack of clean water is an important factor in its spread. In hot countries, many infants die of dysentery and other diarrhoeal diseases.

BILHARZIASIS:

Cercariae penetrate skin during swimming, washing or wading in water. Good drinking and washing habits and the proper use of toilet facilities help to break the chain of infection. This sickness is on the increase in some areas of the world where irrigation farming is done.

CHOLERA:

Transmitted by contaminated water.

DENGUE (BREAKBONE FEVER):

This mosquito-transmitted virus disease is in some places favoured by badly protected water supplies where mosquitoes can breed (wells, jars buried near huts, etc.) The same may apply to other mosquito-borne diseases: yellow fever, malaria, filariasis, o'nyong-nyong, etc.

INFECTIOUS HEPATITIS:

Good sanitation and personal cleanliness help to prevent it. A disease that occurs all over the world.

PARATYPHOID FEVER

Can be transmitted by contaminated water. A frequent disease where sanitation is defective.

RELAPSING FEVER (LOUSE-BORNE):

Frequent bathing and washing of clothes helps prevent lousiness. One of the quarantinable diseases notifiable to WHO. Epidemics now rare.

SCABIES:

An infection of the skin caused by a mite. Where soap and water are plentiful it generally disappears.

TRACHOMA:

This eye disease is associated with poor personal hygiene. It is perhaps the most widespread disease in the world: 400 - 500 million cases.

TYPHOID:

Transmitted by contaminated water, fruit, milk products, etc. Still common where sanitation is poor. Usual fatality rate is 10% if disease is untreated.

TYPHUS FEVER (LOUSE-BORNE)

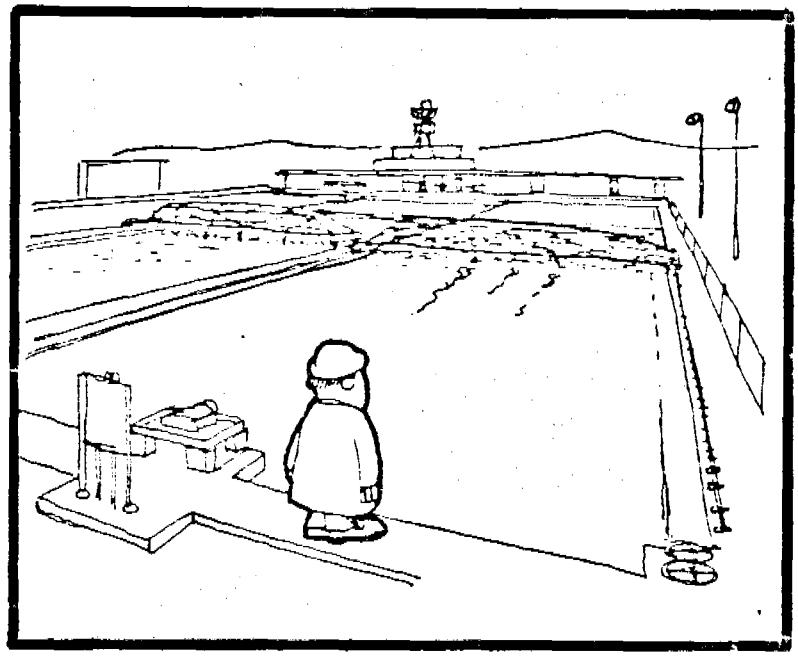
Frequent bathing and washing of clothes prevents lousiness. Formerly a frequent epidemic disease associated with famine, war and refugees. One of the quarantinable diseases notifiable to WHO.

PURE WATER -- WHOSE JOB?

Although it is true that pure safe water rains down on us, it can become contaminated before it reaches our tap. The responsibility for delivering safe, pure, water belongs to both the water utility and the public.

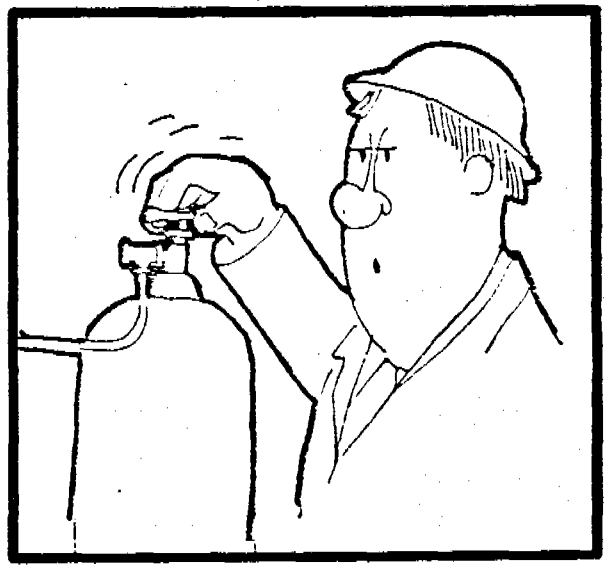
The water utility meets is responsibility in several ways. There are three basic processes performed by the utility that are designed to guarantee that water is safe and clean.

First is sedimentation. After leaving the water source, the water enters a sedimentation basin where particles and debris sink to the bottom. Next the water goes through a filtration process where sand and gravel strain out any impurities or particles still remaining.



SEDIMENTATION BASIN

At this point the water should be clear and sparkling, but it may still be dangerous. Remember that some bacteria, virus and other disease - causing germs are much too small to be filtered out. Consequently, a chemical called chlorine, which kills harmful bacteria may be added to the water. This chlorination is the third process the water utility undertakes to help ensure that your water is safe.



CHLORINATION

The public has definite responsibilities toward the maintenance of pure water, too. It is likely that the cause of the contamination is a careless or uninformed public. Recall the ways in which water might become contaminated:

- If the water source or watershed area is used for bathing, urinating and/or defecating by sick persons or carriers, disease may be transmitted to any one who drinks the water.

- Animals and livestock grazing in the watershed area may leave traces of disease that will be washed into a water source.

- Washing clothes, washing pesticide containers or washing eating utensils in the water source could cause contamination

- Careless handling of water can be a contributing factor to contamination. Water collected in an unclean container could cause disease. A standpipe which is unclean because of children's hands, feet or mouths could also be the source of spreading disease.

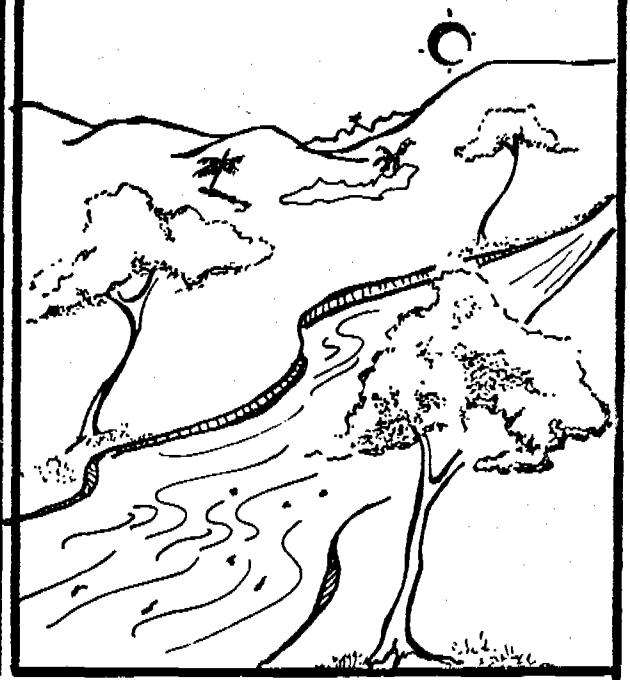
- If people have poor personal hygiene habits, food and drink touched by their hands can become contaminated.

A carrier (person who transmits disease without himself being affected) goes to his garden.

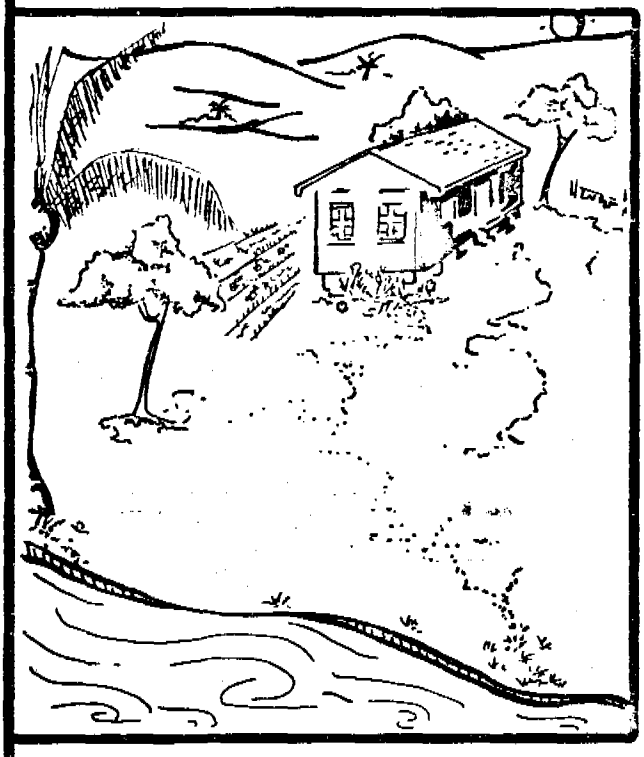
He excretes on land.

Rain falls and washes the excreta to the river

Excreta enters water



A family lives downstream

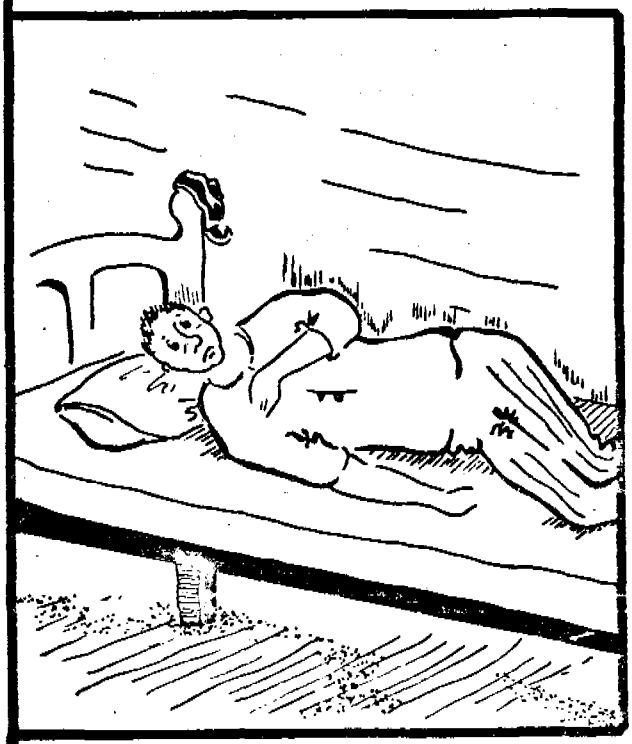


One family member goes with a bucket to collect water

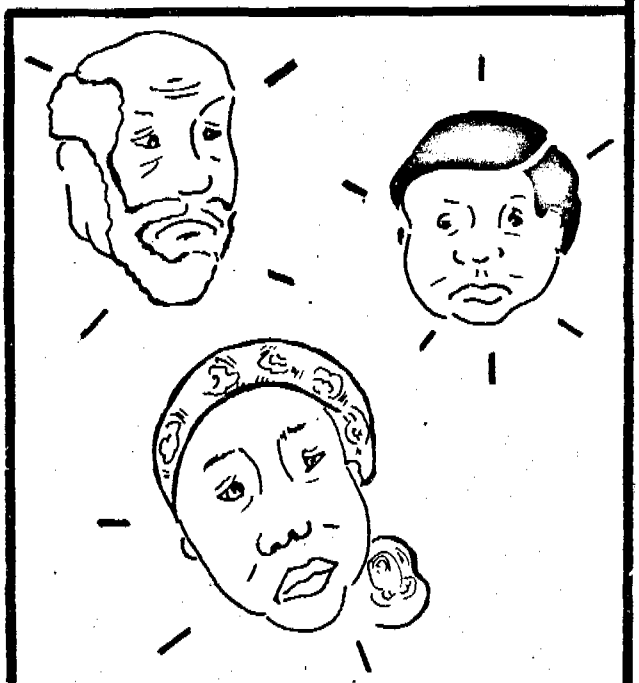
The water he collects contains harmful bacteria.

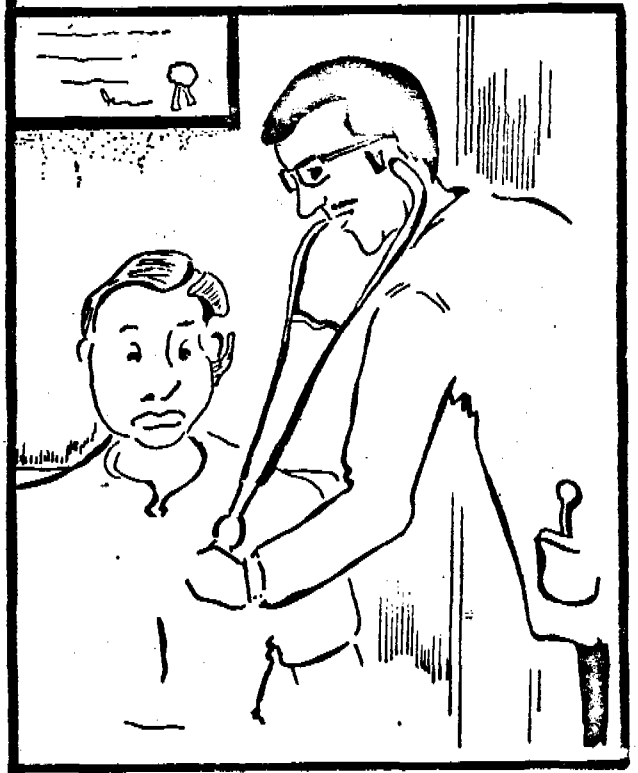
They drink the water without boiling it.

One person gets infected and the disease spreads.

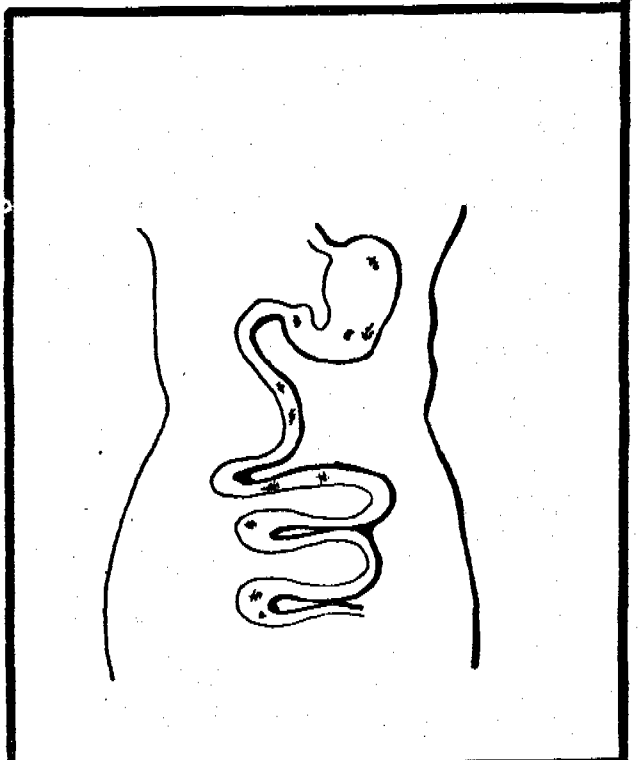


Everybody gets sick.



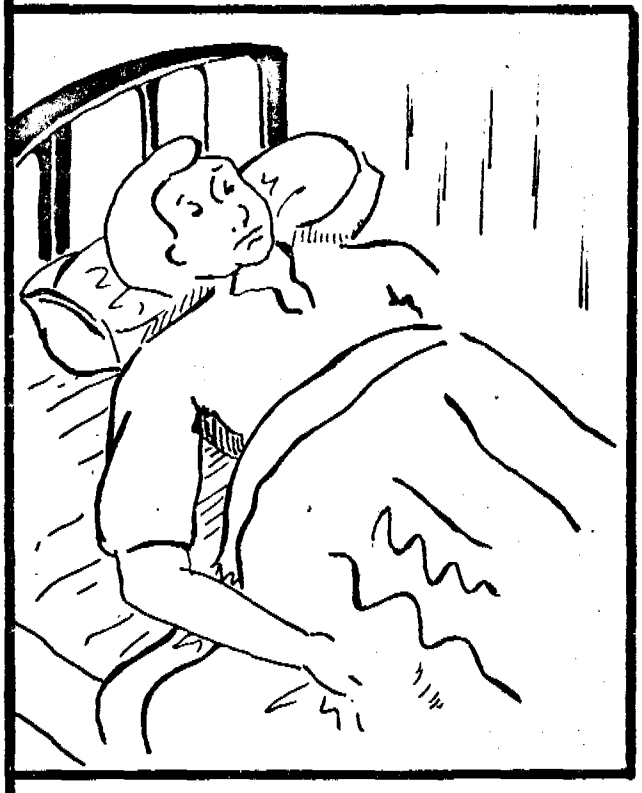


A doctor diagnoses the illness

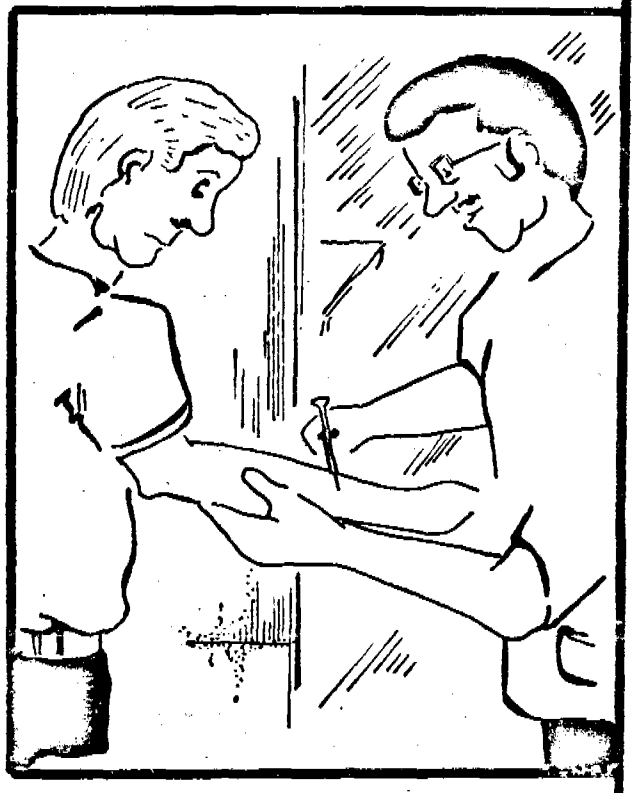


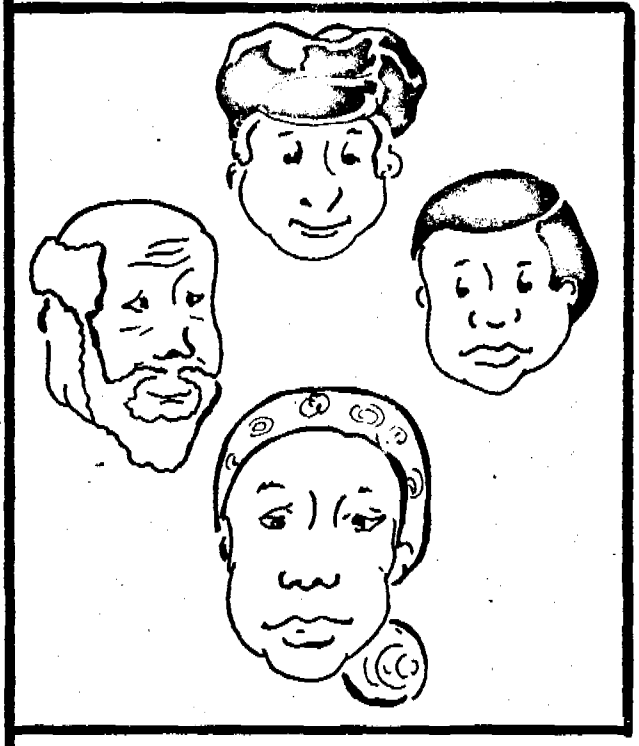
There is bacteria in the stomach and intestimes.

The patient remains in isolation.



He is treated but must still be under observation





Well again!

SUMMARY

Consumers should demand clean and safe water. It is a product that must be pure. The public must also remember, however, that they too have a responsibility to prevent water-borne diseases. The education about the history of disease is a job for parents and teachers alike. Only when people realize that their habits may be the cause of other's poor health will the incidence of water-related illness fall.

You have two jobs. One is to make sure that you do nothing that may contaminate the water supply. The second is to help your fellow citizens understand the relationship between good water and good health.

DISCUSSION QUESTIONS:

1. What is safe water? Why is it important?
2. Discuss some problems and/or diseases which may be brought about as a result of contaminated water.
3. Discuss some problems and/or diseases that may result from inadequate water supplies.
4. Have you ever seen people doing things which could contaminate the water? What were they and why were they wrong? How could you have explained to them that their practice was an unsanitary habit?
5. What steps does the water utility take to ensure that you receive safe water?

CHAPTER 5 WHY DO WE HAVE TO PAY

OBJECTIVE:

Participants will gain some knowledge of the factors that determine the costs of and charges for water service.

PRESENTATION OUTLINE:

I. Introduction illustrating some of the common objections raised by consumers in connection with paying water rates.

II. Facts about water costs and water charges.

a) Water utilities are heavily subsidised.

b) Customer costs and capacity costs.

c) Methods of establishing water rates.

d) Benefits of water meters.

E) Benefits of a self-supporting water system.

F) Examples of water costs in relation to other commodities.

NOTE TO THE INSTRUCTOR:

This presentation can be made more meaningful to your listeners if it is accompanied by your own slide show illustrating some of the costly components of your water system. You might also want to have volunteers act out or role-play an argument similar to the one that appears in the first 3 paragraphs of 'Suggested Content'

SUGGESTED CONTENT:

TWO FRIENDS

THE ARGUMENT

The argument was in full process. Harry pounded the table and his voice rose, "The air is free. Rain is free. Rivers and streams are free. I don't have to pay when I drive or walk on the road. I don't have to pay when I turn on the radio. So, why should I have to pay when I turn on the tap and get some of that free rain? I tell you ... it's not fair!"

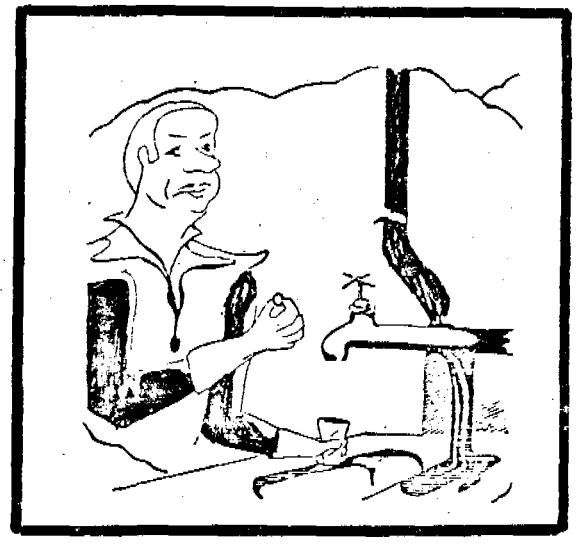
With this last exclamation, Harry settled back in his chair and glowered at Tom who was tapping his fingers irritatingly on the table. "Look, Harry, if you want to go live on a mountain as a hermit, you can have all the water you can find. All for free! But, if you want clean pure water delivered to your tap you should be prepared to pay for that service."

Harry sputtered and grumbled, "I do pay. I pay every year. Now they want me to pay more. Why should the cost of water go up? It's free when it falls and it should be free when I drink it." (Harry and Tom have been having this same argument for six years. Neither, it appears, will ever convince the other of his point of view, but their friendship grows, nurtured by their common love of argument.)

The hour grows late and the endless argument continues. It is well after midnight when Harry falls into bed for a night of disturbing dreams.

THE DREAM

In his dream, it is the year 2137 A.D. Harry, thirsty after his quick rocket flight from a neighbouring planet, puts 25 cents in a slot near the kitchen sink. Quickly placing a glass under the tap, he receives 8 ounces of clear, sparkling, pure water. Next, his body sluggish and desirous of clean pure air, he deposits another 25 cents in a slot near the back door. He slips a mask over his mouth and nose and is soon enjoying the luxury of three minutes of unpolluted air.



Harry's 7 and 10 year olds dash in from school and because their individualized computer-teacher reports that they've done well in today's astro-physics class, Harry allows them a special treat. They may share a glass of water. Refreshed, the children sit in front of the "wall-sized" television to watch a movie about the olden days. They laugh with disbelief when they see the actors pretend to turn on faucets and let water just run out.

"Why they don't even pay!". Another scene shocks the children even more. Imagine being able to play with water squirting from a hose!

Tiring of such a foolish program, the children turn off the TV and begin to ask Harry questions. "Is it true," they begin, "that in the olden days people didn't have to pay for fresh air? Could people really have lots and lots of water for only a few dollars a year?" Harry mumbles and groans. He can't seem to answer. His mouth is dry. He awakens. He is confused and he takes a big breath of free fresh air and goes to the kitchen for an almost free glass of water.

Early the next morning, Harry decides to find out a bit more about the proposed water rate hike on his island. He certainly doesn't want to have to pay 25 cents for a glass of water and he is determined to discover just why the utility thinks they should charge for water from the heavens.

THE FACTS

Harry found out many things and disappointed Tom that evening by refusing to argue about water charges. Their long-running argument finally c me to an end as a result of these facts.

- Water utilities on most islands are heavily subsidised by Governments. Consequently, Harry has been paying for his water indirectly all along because he has been paying taxes.

- The nominal amount collected from water bills each year does not begin to pay for the cost of the water.

- The cost of water service to customers can be divided into two categories:

  a) Customer costs are those that arise to make service available. Such costs include billing, administration, utility payrolls, vehicles, maintenance and operation of the distribution system (intake, mains, valves, pumps, service connections). Fire protection may also be included.

  b) Capacity costs are dependent upon the customer's demand for water. There are various classes of users: residential, commercial and industrial) and they may be charged differently depending on the demands they place on the system.

- There are several methods used to establish a water rate.
  a) Flat rate, which is a monthly or half-yearly charge
  b) General rate, which is determined by the number of fixtures in the home.
  c) Metered rate, which is determined by measuring the amount of water used at each service.

- More and more water utilities are considering installing home water meters and charging by the metered rate. With a water meter, people will pay for only the amount of water used. It is expected that the amount of water wastage will be reduced when people are aware they are paying for that wastage. It is also expected that water customers will be more cooperative in finding and having leaks repaired.

- When a water utility is self-supporting, it is more modern and efficient because it has the capital to improve and properly maintain the water system.

- In Dominica in 1973, the cost of a 10 ounce bottled soft drink was 20 cents. The cost of 10 ounces of fresh water was .004 cents. In the same year, it cost 12 cents to mail a one ounce letter. For the same 12 cents, the consumer could have 171 gallons of clean pure water. Water is a bargain!

SUMMARY

The more Harry learned about the costs of water, the more he came to believe that each customer should pay his fair share of the total revenues needed by the water utility. Harry and Tom now both believe that the charge for water should be in direct relationship to the cost of supplying that water service.

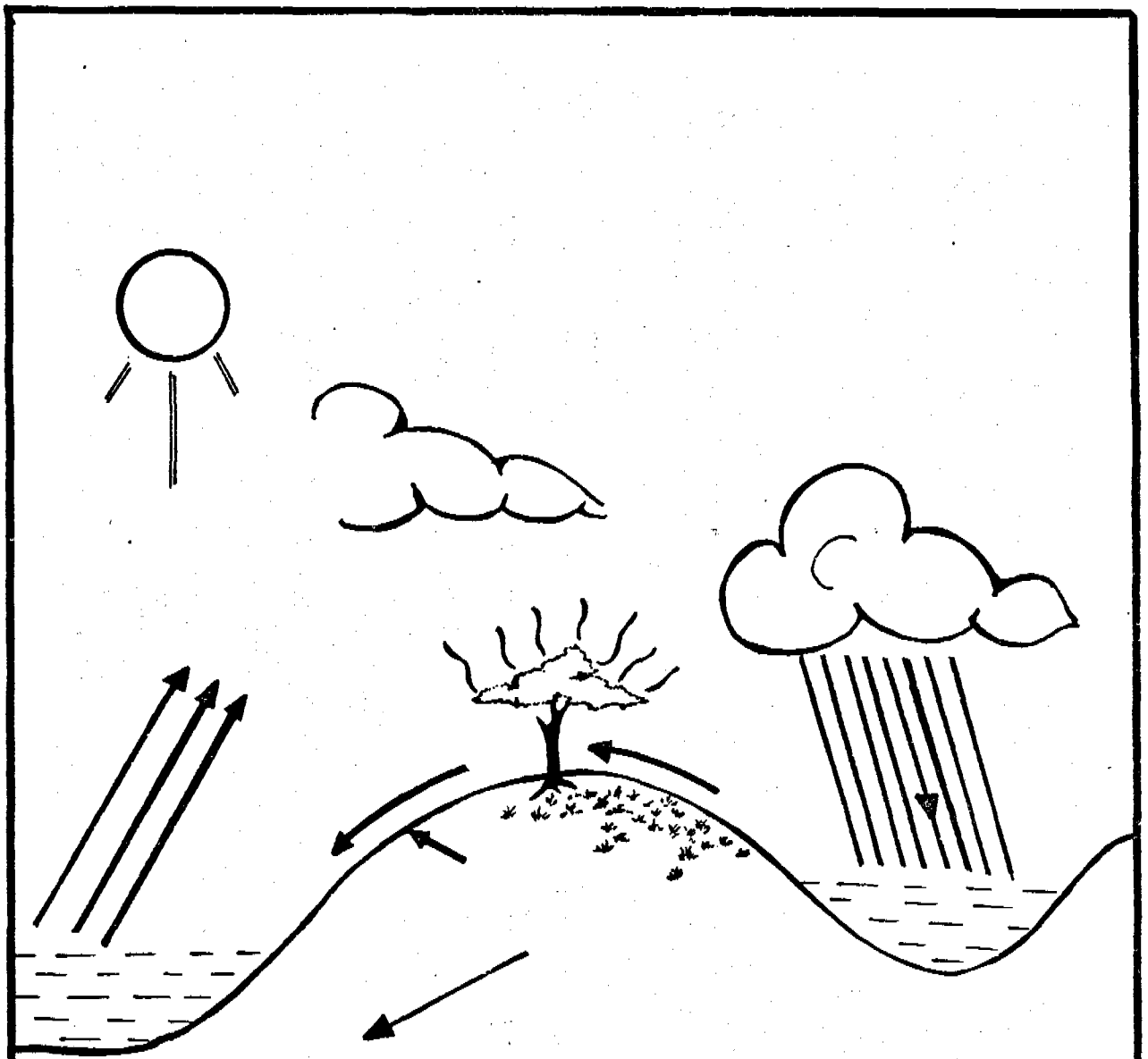
Harry and Tom are still friends and are still arguing. Harry believes that petrol taxes should be high enough to cover all the costs of road maintenance. But Tom says .... well, that's another story.

DISCUSSION QUESTIONS:

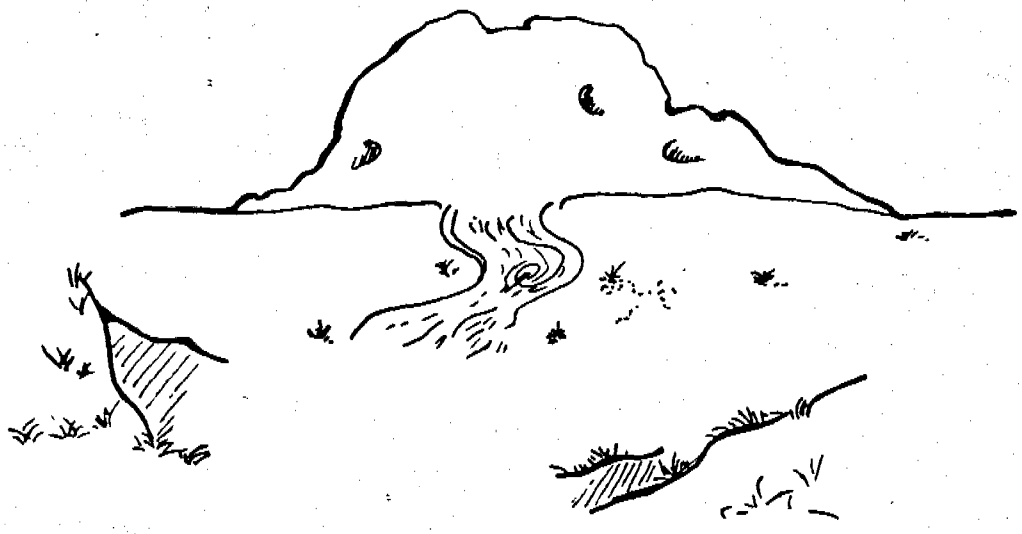
1. How are water rates determined on your island?
2. What are some of the expenses that determine the real cost of your water?
3. Do you think home water meters are a good idea? Why?
4. Do you believe a water utility should be self supporting? Why or why not?

ANNEXES*

*Suggested for Transparencies



Reference: Chapter 1 Page 8



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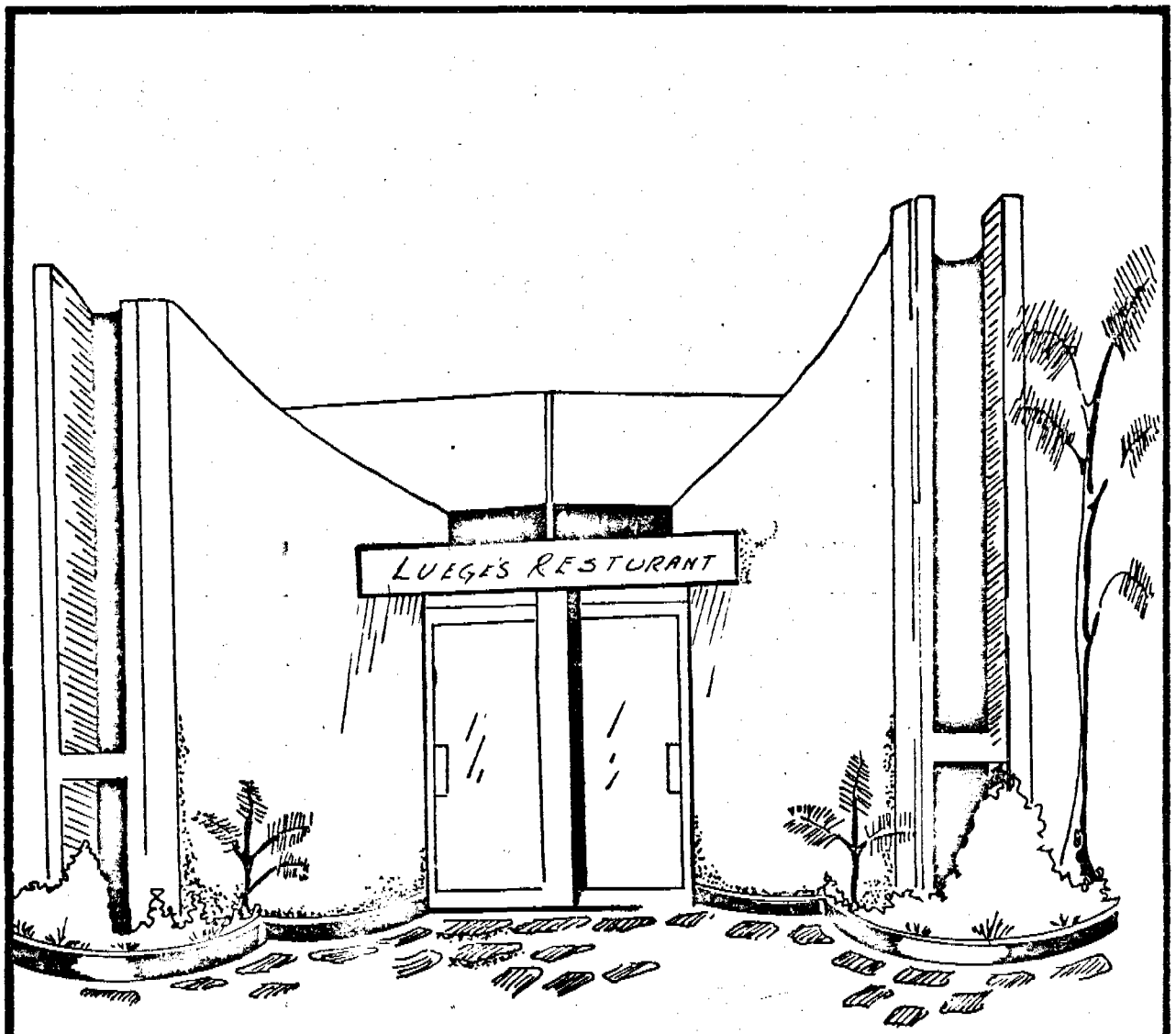

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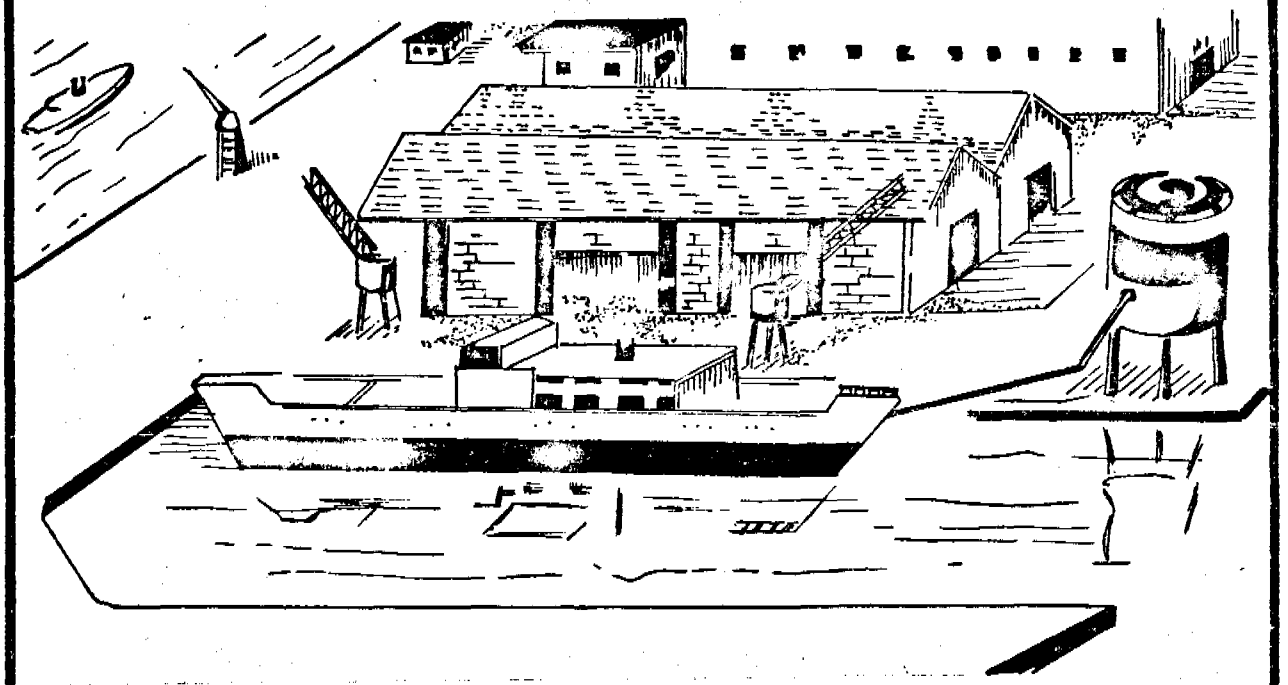

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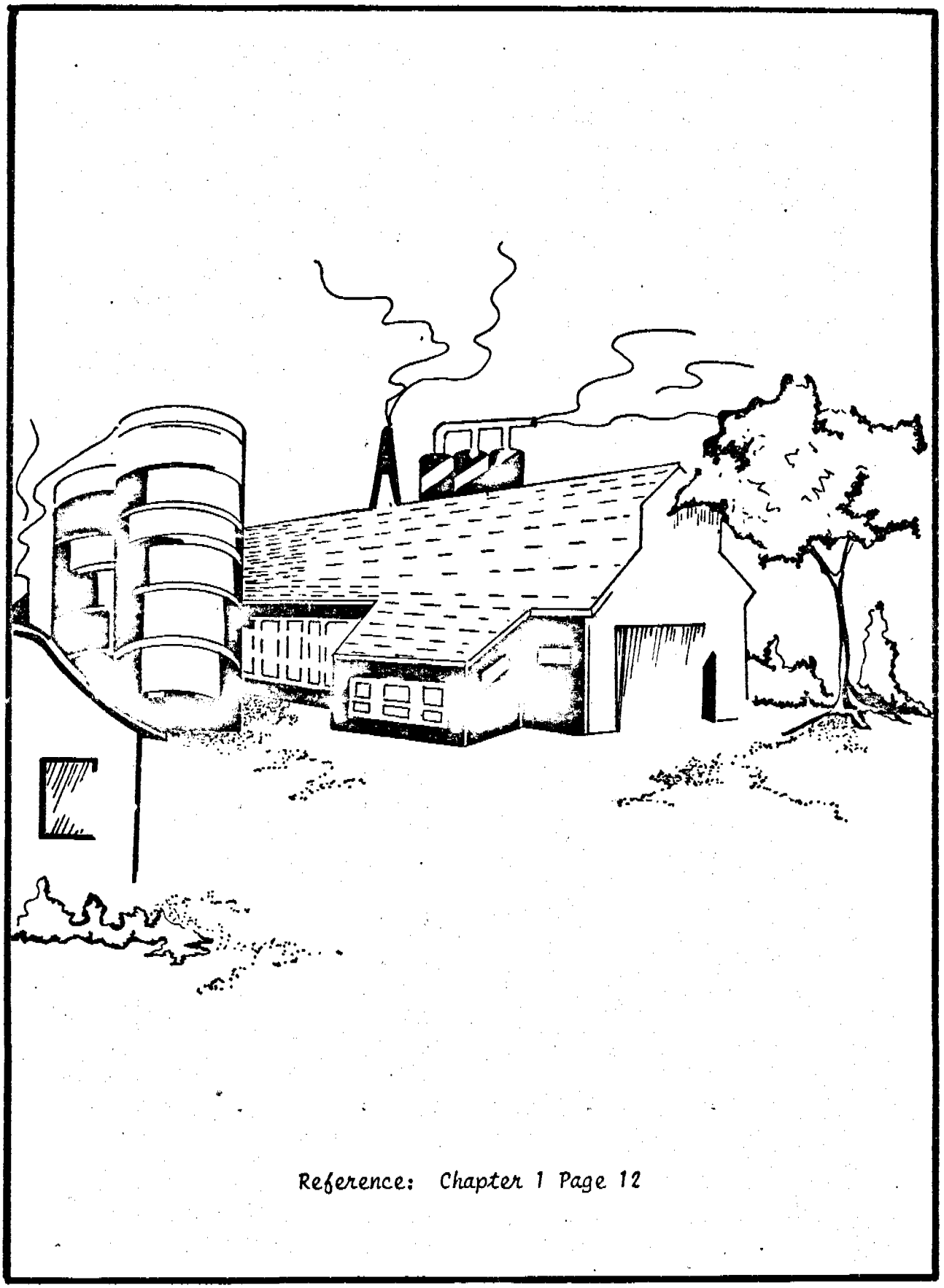

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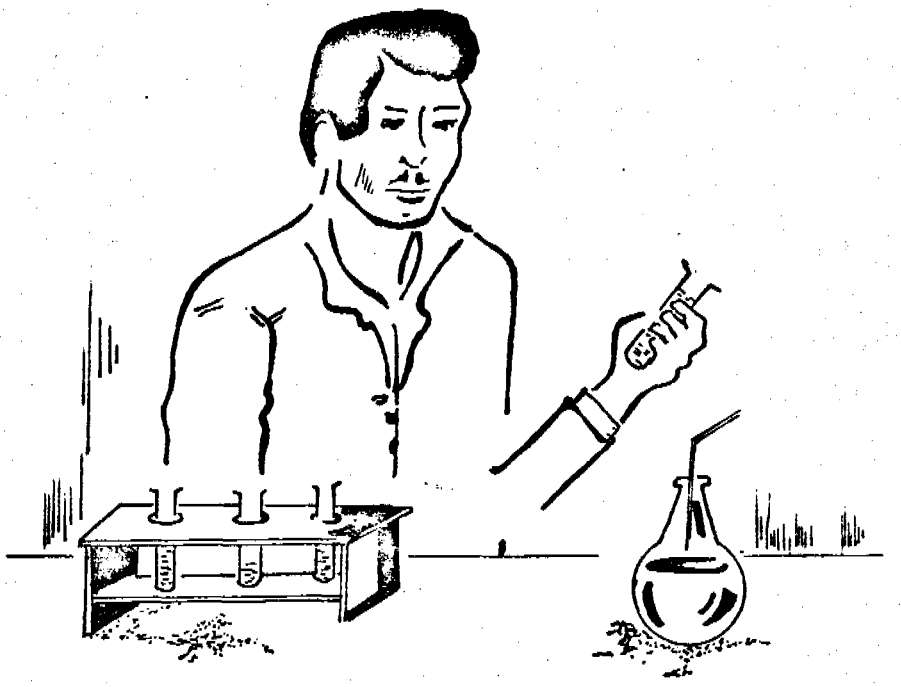

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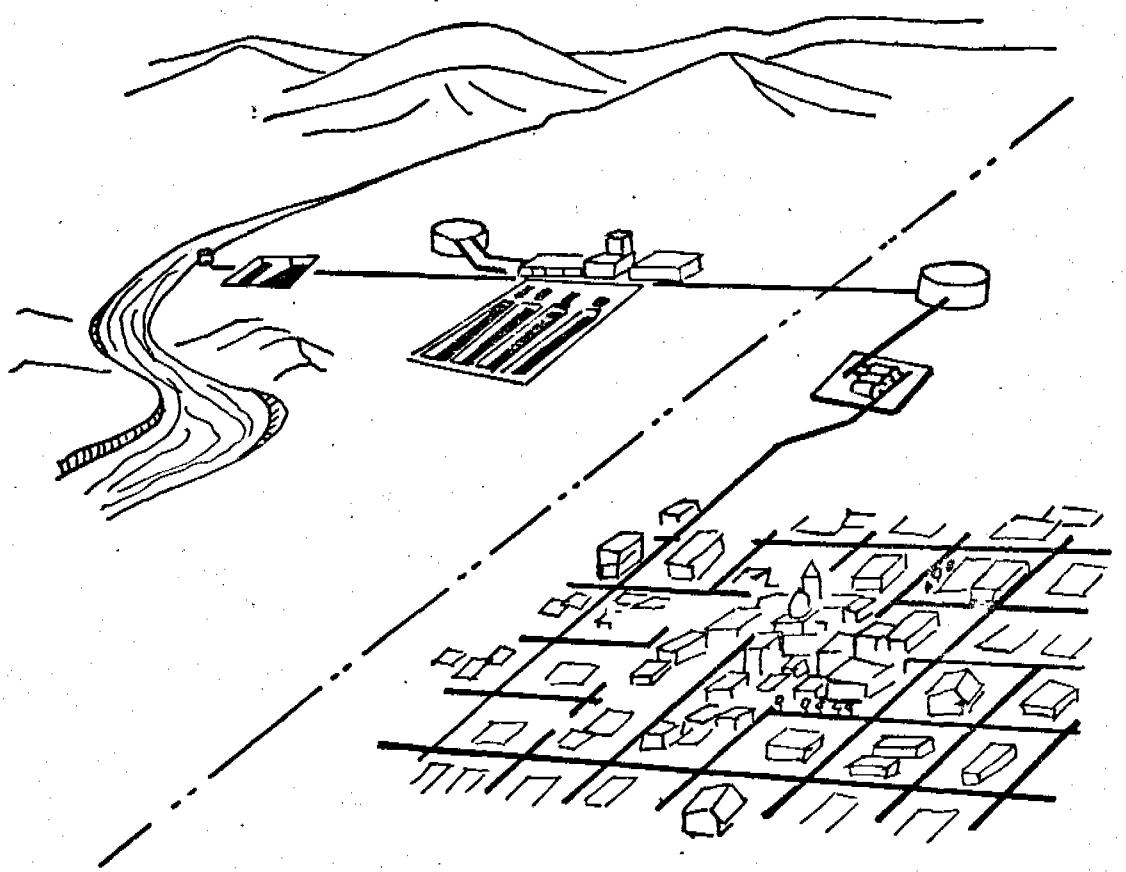

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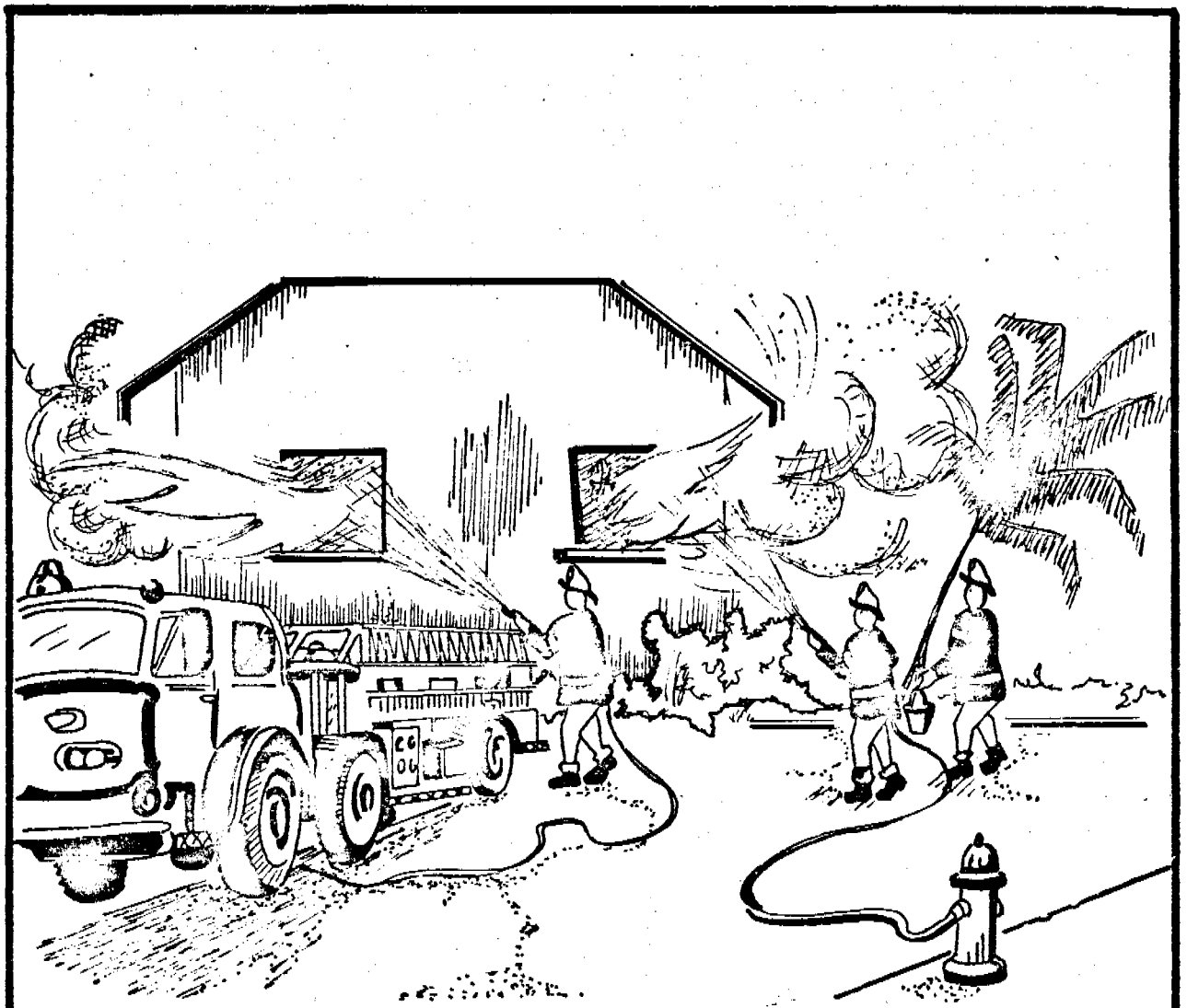

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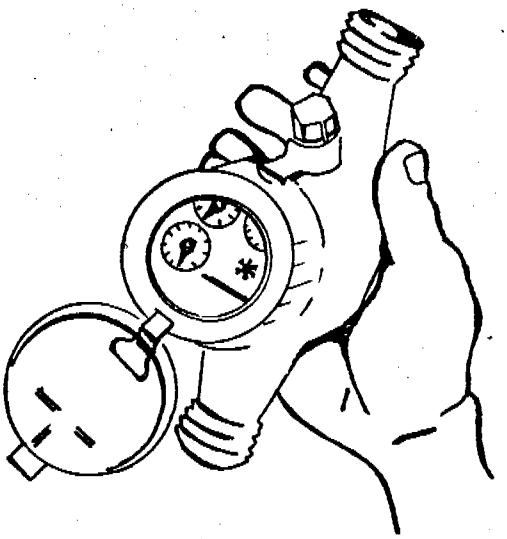

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