GREEN TREASURE IN UTAH

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GREEN TREASURE IN UTAH

This book is an example of how Business and Public Education can cooperate in the production of useful and useable teaching materials.

The project started with an IDEA. We, the American Can Company, had the thought that a contemporary story of Utah's agricultural wealth - its production, processing, and distribution - could be the basis for an explicit teaching text that would be valuable to the Utah school system.

We took the idea to Salt Lake City to ask the State Department of Education for an opinion of its value. Said we: "Is the idea a good one? Does a curricular need exist? We will underwrite publication costs for the book if you will advise and guide us. Above all, we want professional educators to plan and write the materials."

The Superintendent of Schools of Salt Lake City was called into the conference. He in turn involved members of his supervisory staff. Together they developed the plan to convert the idea into reality.

The proposal was received with surprise and interest. "Too often," remarked one educator, "business firms offer us costly materials that can't be integrated into class study because nobody will take time to find out how they could be used. You are examining the need and the teaching adaptability in advance. It makes sense."

Everybody agreed that the topic idea was a good one. An examination of curricular needs and centers of interest suggested that the book be written for use at upper elementary levels. It was understood that selection of materials and writing should be left entirely to the author and his professional advisors.

That's how the book was started. At each stage of its development Green Treasure In Utah benefited by directive counsel and advice from the educational sponsors. We provided pictures and printing facilities and gave the author full latitude with respect to content, viewpoint, and style.

The final manuscript had the critical review of members of the staff of the Salt Lake City schools.
Beyond all this, the sternest critics - pupils and teachers tested the material in many classrooms before final printing.

We welcome the use of Green Treasure In Utah in any way that will advance the cause of good education.

AMERICAN CAN COMPANY

104 South Michigan Avenue

Chicago 3, Illinois

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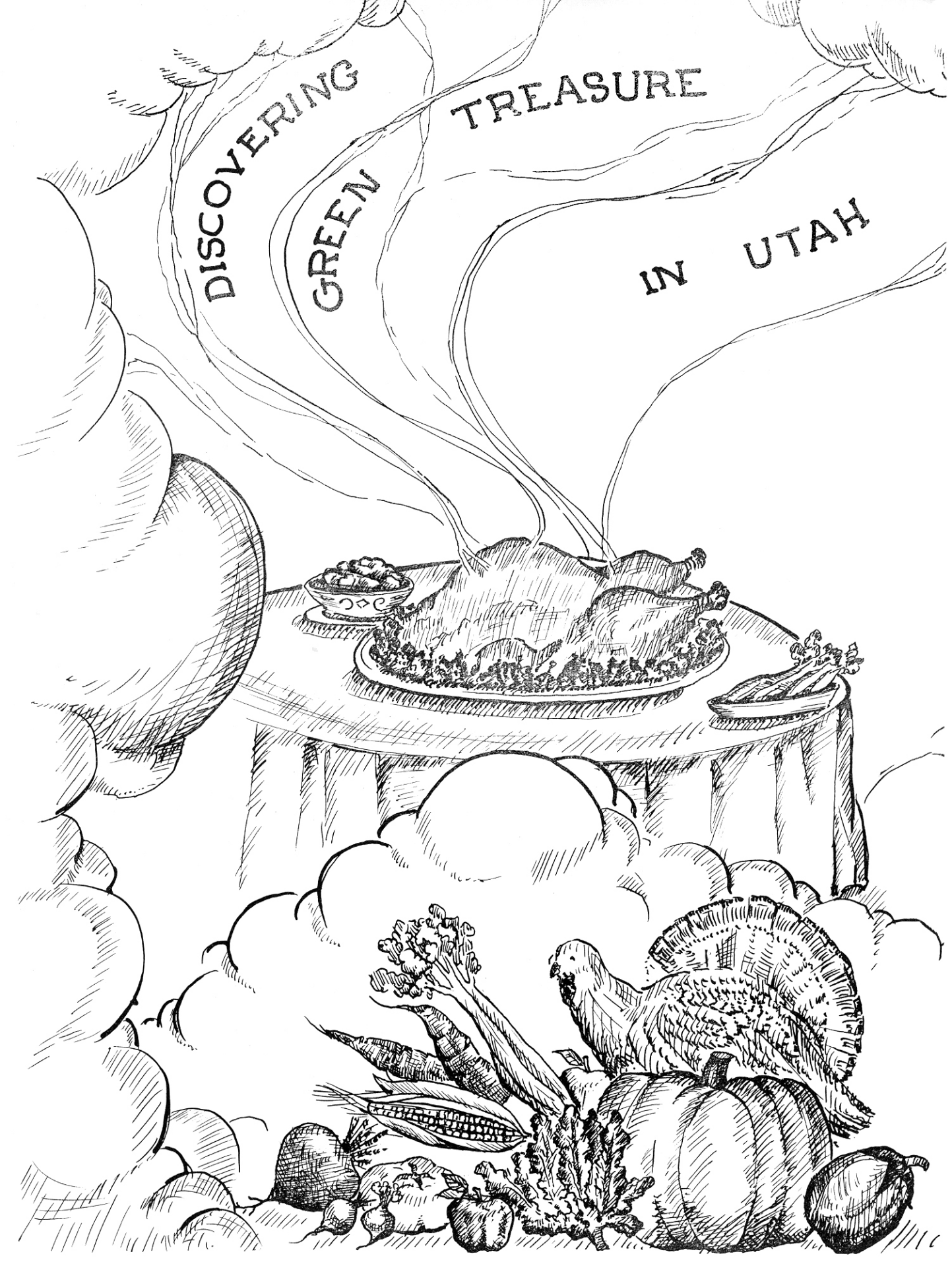

DISCOVERING
GREEN
TREASURE
IN UTAH

A FOOD GUESSING GAME

Have you ever wondered where different foods come from? It's fun to guess. Almost everyone likes to play a guessing game. Try it yourself tonight. Look around your supper table. Ask yourself, "Where did this come from?" Likely as not you will find on your table some of the foods shown on the opposite page.

These foods will be easy to guess because they all are raised in Utah. Other foods you eat will have come from far away, maybe hundreds of miles. It will be harder to guess where they were grown. That is what makes the game fun to play. Learning new things about food can be fun.

How good this food looks! Just seeing it may make you hungry to eat some. Foods

that look good and taste good give us big appetites so that we eat well. It is important that we eat well and eat the right kinds of foods. Good foods make us feel better and look better.

Because the right foods are good to look at and good for us, let's give them a name to show how valuable they are to us. Let's call these good foods GREEN TREASURES.

A GREEN TREASURE HUNT

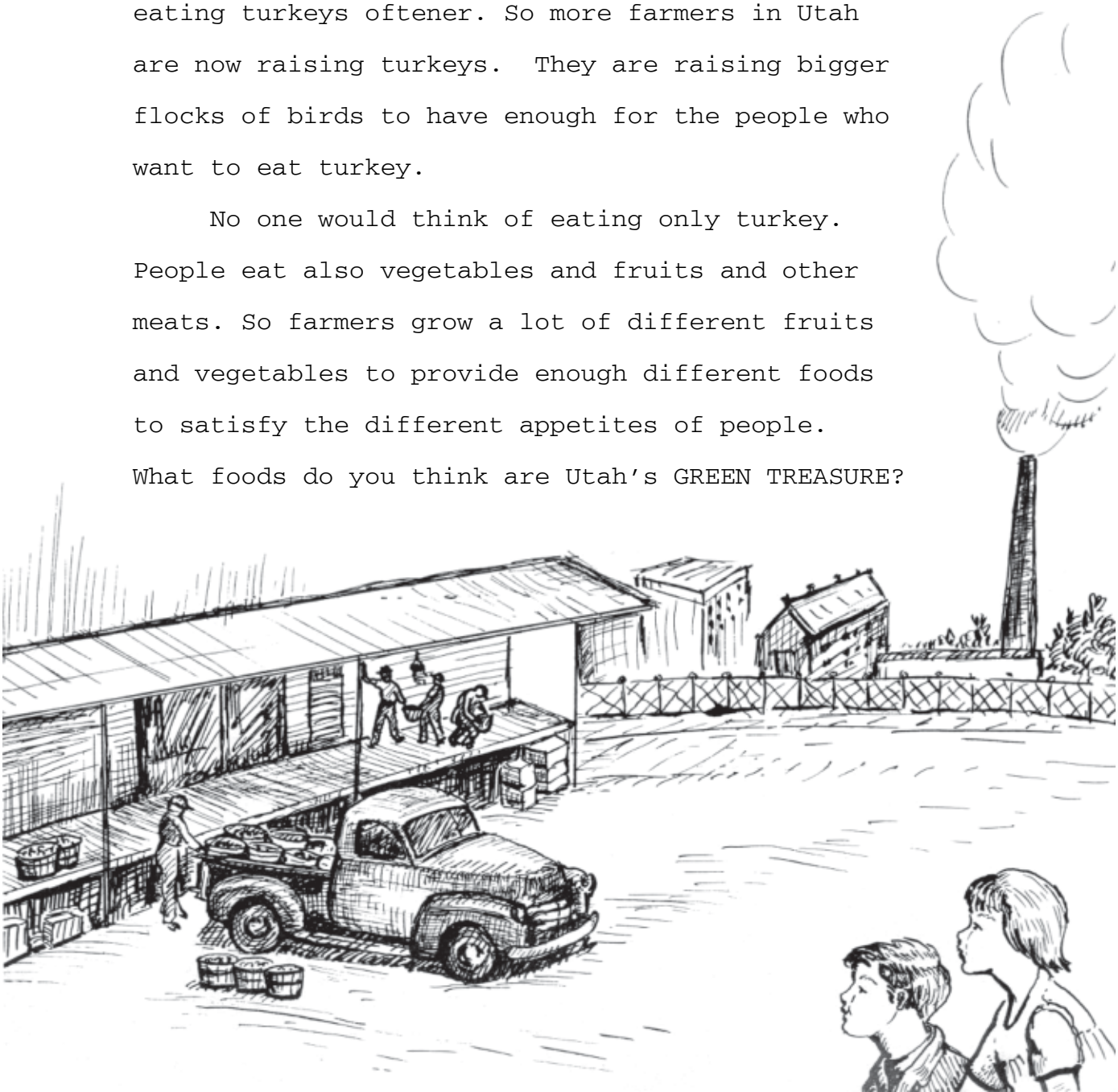
Hunting for information is very much like hunting for treasure. So let's go on a GREEN TREASURE hunt to discover everything we can about the foods that are good to look at and good for us. Let's find out what GREEN TREASURE Utah produces. Let's also find out what GREEN TREASURES other states produce. We will start with the Utah foods we saw on the first page.

Were some of these foods raised near you? Have you watched them grow? Have you seen trucks taking them to market? Have you gone to the store to buy them? A lot of different people work together to supply the GREEN TREASURE

we eat. One is the farmer who grows it. Another is the truck driver who transports it. Still another is the man who sells it.

A team of people supplies the food we eat. The more people eat, the more food must be raised. An example is turkeys. More and more people are eating turkeys oftener. So more farmers in Utah are now raising turkeys. They are raising bigger flocks of birds to have enough for the people who want to eat turkey.

No one would think of eating only turkey. People eat also vegetables and fruits and other meats. So farmers grow a lot of different fruits and vegetables to provide enough different foods to satisfy the different appetites of people. What foods do you think are Utah's GREEN TREASURE?



UTAH'S GREEN TREASURE

Tomatoes, beans, beets, carrots, corn, and peas are some of the vegetables that grow in many gardens throughout our state. Some of these gardens are small. They provide just enough food for the family of the gardener to eat. Other gardens are big. The gardener raises enough to supply his own family, and sells the rest to the market for other people to eat. People eat vegetables because they are good to taste and good for them. We all should eat one or more vegetables every day.

Utah grows fruits too. Apricots, cherries, peaches, pears, and many different berries are raised for us to eat. Some farmers take their surplus fruits to market to be sold to other people to eat.

One of our state's special crops is crisp, white celery. It is known throughout the United States. Utah has many other GREEN TREASURES, but not all foods we eat grow in our state. Some GREEN TREASURES grow outside of Utah.

GREEN TREASURE TRAVELS GREAT DISTANCES

Some foods must travel a great distance before they reach our tables. Some may travel by boat over the ocean, then by train or truck or plane to Utah to our tables. We eat sweet potatoes from Louisiana, Texas, or California. We eat oranges, grapefruit, and lemons from California, Arizona, or Florida. Pineapple comes from far away Hawaii.

The climate in these places is right for the growth of these foods. For example, bananas need a long growing season in a climate that is warmer and wetter than Utah's climate. Central American countries have such a climate. Banana-growing there is a big industry. The bananas are picked while they are still green. Then they are loaded on boats for their trip across the water to America, and finally reach Utah by train or truck. If, after their long trip to our stores, the bananas are not ripe enough to eat, they are put in warm rooms to ripen.

Wheat for the flour which we use in making bread may have grown in Kansas. The cranberries we eat with our turkeys at Thanksgiving may have grown two thousand miles away in Maine. So you can see that we depend on many people in far away places for the food we eat.

In the same way people in other places depend on us for products that grow best in Utah. An example of this is celery. Celery grown in Utah has better quality than that grown in New York. The celery people eat tonight in New York probably was shipped there by train from Utah.

So GREEN TREASURE is everywhere. Utah has some. Other parts of the world have some. We exchange this GREEN TREASURE with each other to get a variety of food to eat.

Utah does not furnish all the food for her people to eat. No state does that. Even people who live where particular foods grow best may occasionally have to buy these same foods from other places. Sometimes there are food shortages when there is not enough food

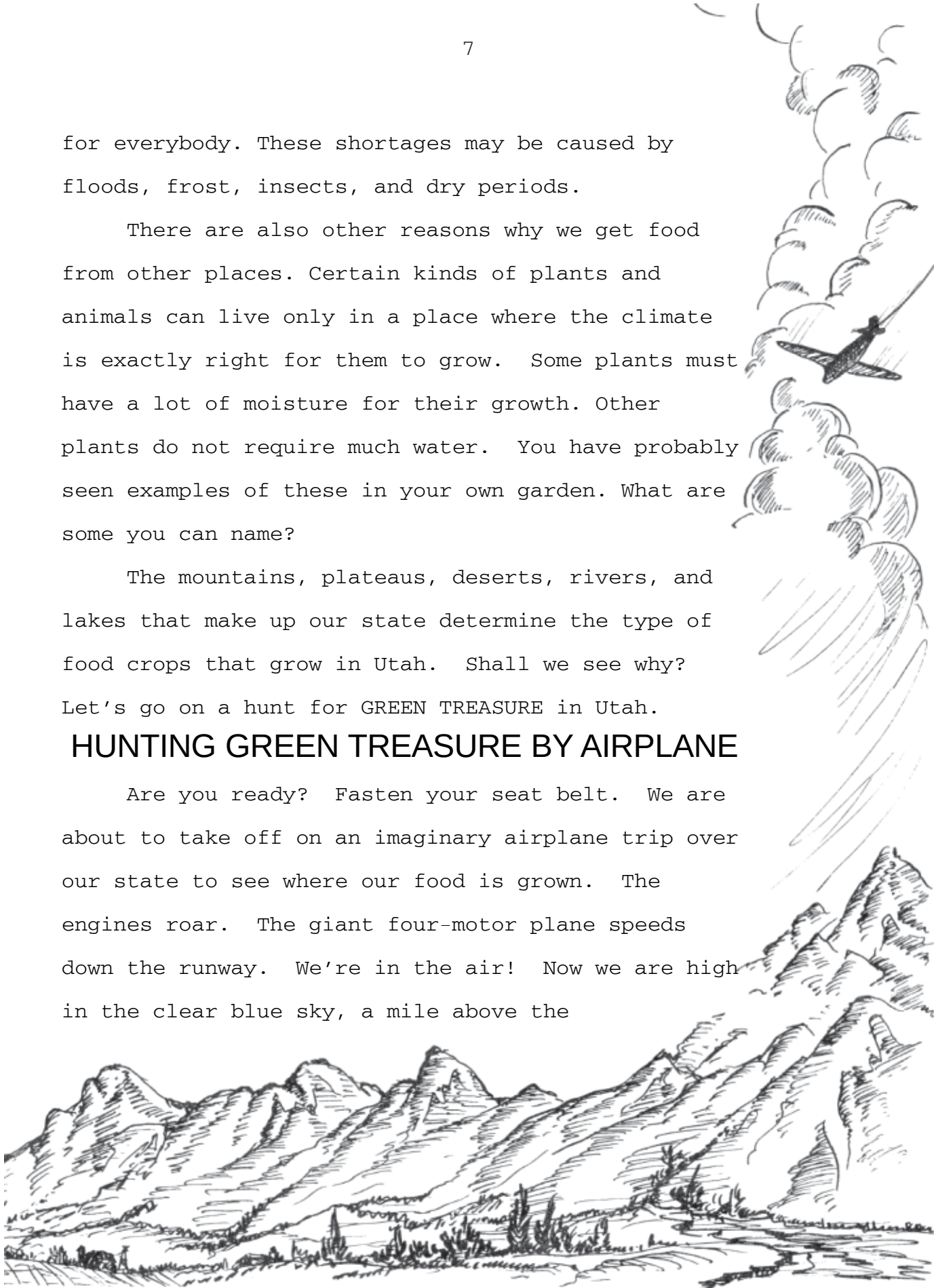
for everybody. These shortages may be caused by floods, frost, insects, and dry periods.

There are also other reasons why we get food from other places. Certain kinds of plants and animals can live only in a place where the climate is exactly right for them to grow. Some plants must have a lot of moisture for their growth. Other plants do not require much water. You have probably seen examples of these in your own garden. What are some you can name?

The mountains, plateaus, deserts, rivers, and lakes that make up our state determine the type of food crops that grow in Utah. Shall we see why? Let's go on a hunt for GREEN TREASURE in Utah.

HUNTING GREEN TREASURE BY AIRPLANE

Are you ready? Fasten your seat belt. We are about to take off on an imaginary airplane trip over our state to see where our food is grown. The engines roar. The giant four-motor plane speeds down the runway. We're in the air! Now we are high in the clear blue sky, a mile above the



earth. Flying around, we can look down to see for ourselves where our food is grown.

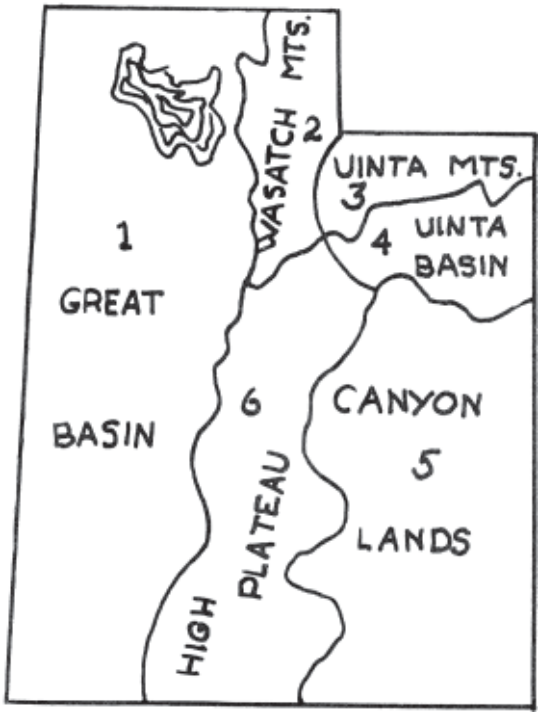
We can see the mountains. We can study the plateaus. We can locate the deserts, and follow rivers and lakes to see how the combination of all these things determines which plants and animals grow in Utah. From our plane window we can see many miles of the state all at one time. Let's open our map. Mark the interesting points as we soar through the air.

In his cockpit up forward our pilot flies the great plane over the land that makes up our state. On our map it looks like a mammoth rectangle of earth and mountains with the northeast corner cut out by Wyoming. We look at the legend on our map and see that Utah has a land area of more than 52 million acres. It is tenth among the states in size.

Flying over our state, we see desert lands, mountains, plateaus, valleys, rivers, and lakes. These divide our state into six parts or divisions. Locate these on the map on the next page.

OVER THE GREAT BASIN

We are flying over the Great Basin, which is a broad plain located in the western half of our state. It extends beyond Utah's boundaries into Nevada, Idaho, California, and Oregon. Below us we see desert lands stretchi1g out for miles and miles. These lands are used for winter grazing of cattle and sheep. They eat the desert plants that grow there.



We can see some mountains rising very steeply out of this wasteland. Our pilot tells us they are the Wah-Wah Mountains, the House Range, Confusion Range, and the Deep Creek Range.

Miles below our plane, the Sevier River winds through the southwestern part of the Great Basin. During some parts of the year some of the smaller

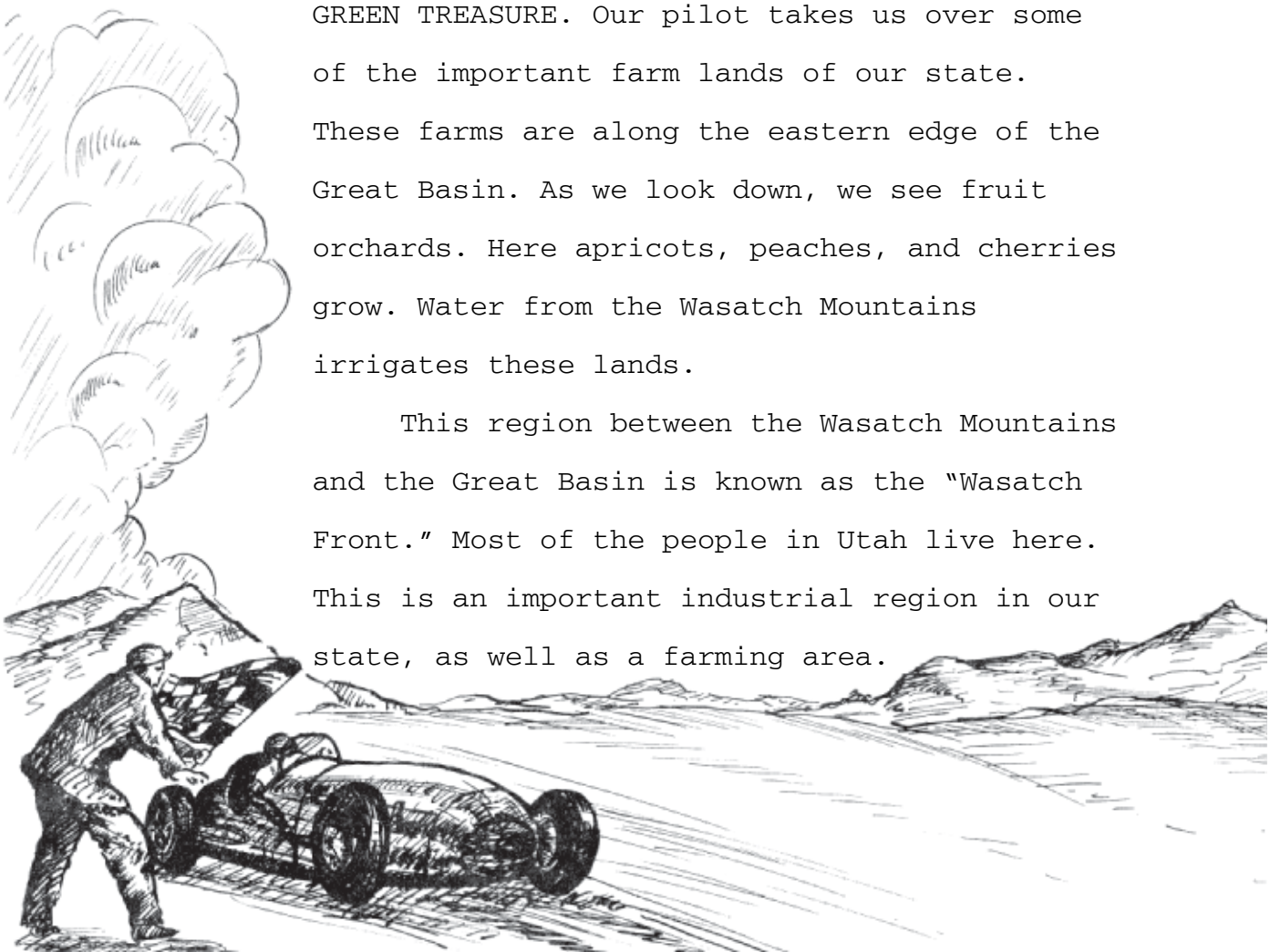
streams of the Sevier River dry up. This is partly due to the small amount of rainfall.

Our pilot heads the plane north. Minutes later we see a large body of water. It is Great Salt Lake. We remember what fun we've had floating in these salty waters.

Surrounding most of the lake are miles and miles of salty desert. These smooth, flat lands extend such great distances that they are sometimes used for auto racing.

Leaving the Great Basin we find our first GREEN TREASURE. Our pilot takes us over some of the important farm lands of our state. These farms are along the eastern edge of the Great Basin. As we look down, we see fruit orchards. Here apricots, peaches, and cherries grow. Water from the Wasatch Mountains irrigates these lands.

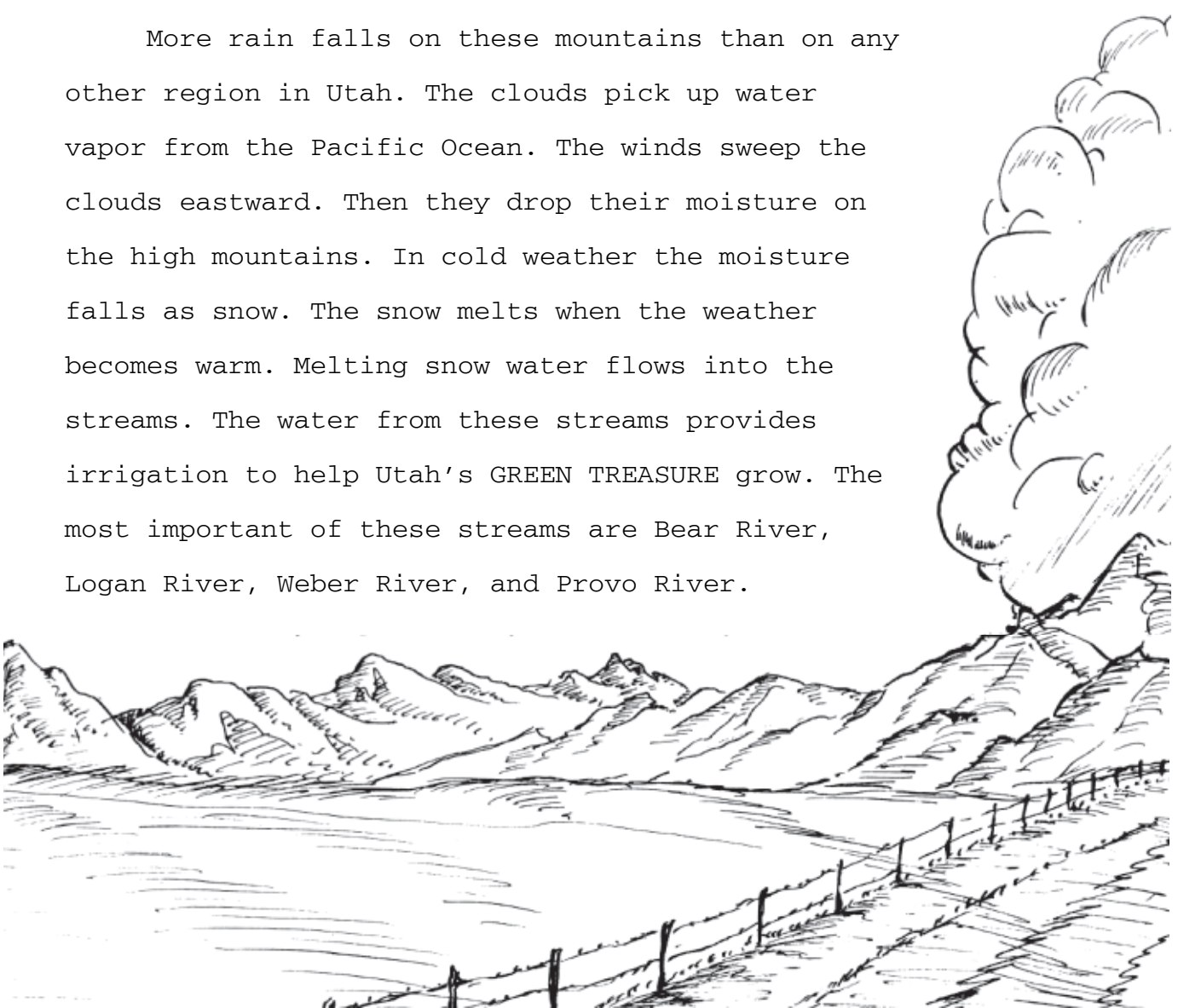
This region between the Wasatch Mountains and the Great Basin is known as the "Wasatch Front." Most of the people in Utah live here. This is an important industrial region in our state, as well as a farming area.



CROSSING THE WASATCH MOUNTAINS

Now our pilot pulls back the wheel. We are gaining altitude. We must fly higher because of the rugged mountains ahead. These high mountains make up the Wasatch Range. They reach up thousands of feet into the sky and stretch from the northern part of our state to Mt. Nebo. From there, smaller mountains extend beyond the southern border of the state.

More rain falls on these mountains than on any other region in Utah. The clouds pick up water vapor from the Pacific Ocean. The winds sweep the clouds eastward. Then they drop their moisture on the high mountains. In cold weather the moisture falls as snow. The snow melts when the weather becomes warm. Melting snow water flows into the streams. The water from these streams provides irrigation to help Utah’s GREEN TREASURE grow. The most important of these streams are Bear River, Logan River, Weber River, and Provo River.

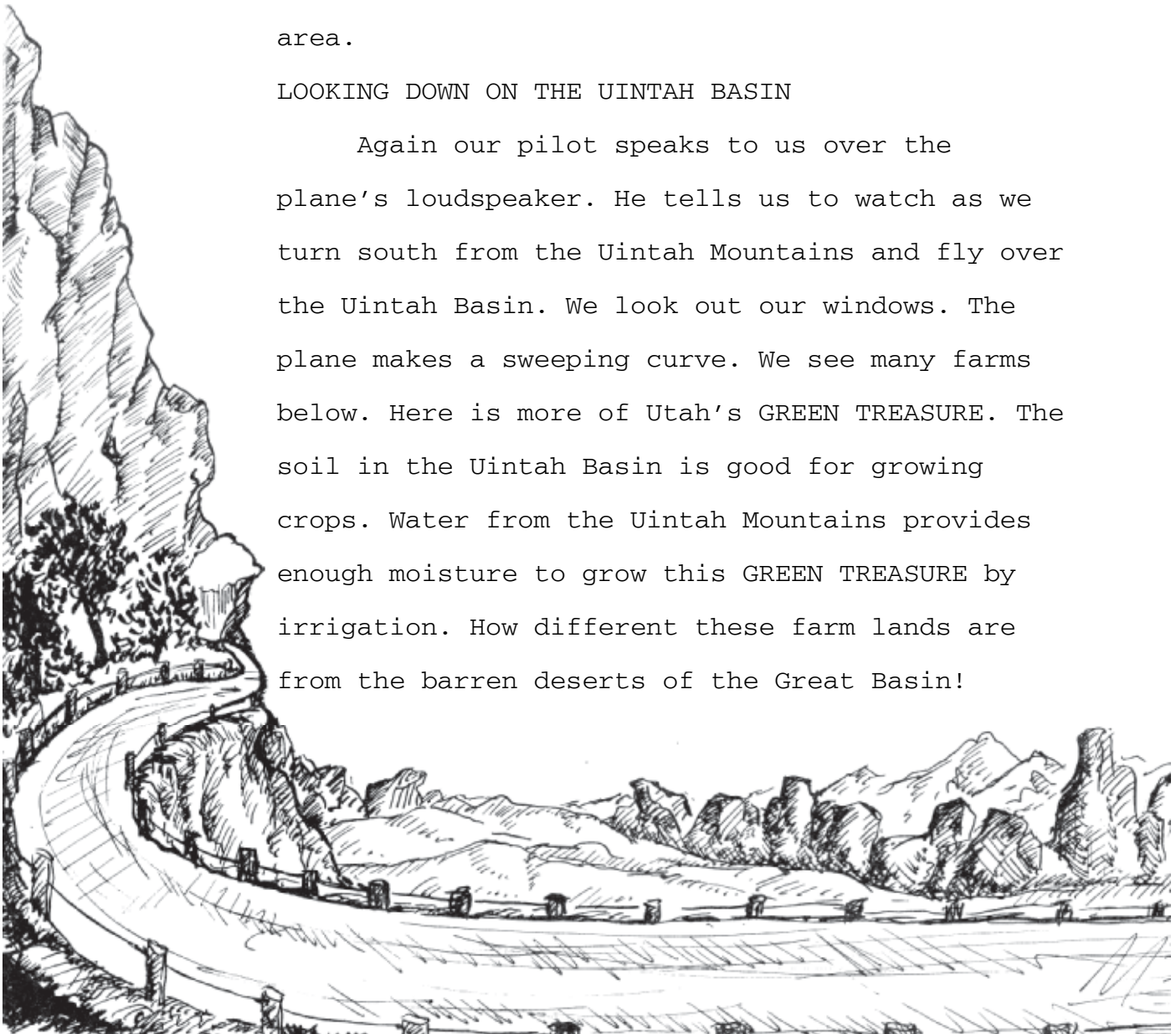


FLYING ABOVE THE UINTAH MOUNTAINS

Our plane speeds on. Now we are across the Wasatch Range flying east. Below us are mountains running in a different direction. They are the Uintah Mountains in the northeastern part of our state. They run east and west. These mountains are the only mountains in our state that run east and west. They make up another division of land area.

LOOKING DOWN ON THE UINTAH BASIN

Again our pilot speaks to us over the plane's loudspeaker. He tells us to watch as we turn south from the Uintah Mountains and fly over the Uintah Basin. We look out our windows. The plane makes a sweeping curve. We see many farms below. Here is more of Utah's GREEN TREASURE. The soil in the Uintah Basin is good for growing crops. Water from the Uintah Mountains provides enough moisture to grow this GREEN TREASURE by irrigation. How different these farm lands are from the barren deserts of the Great Basin!



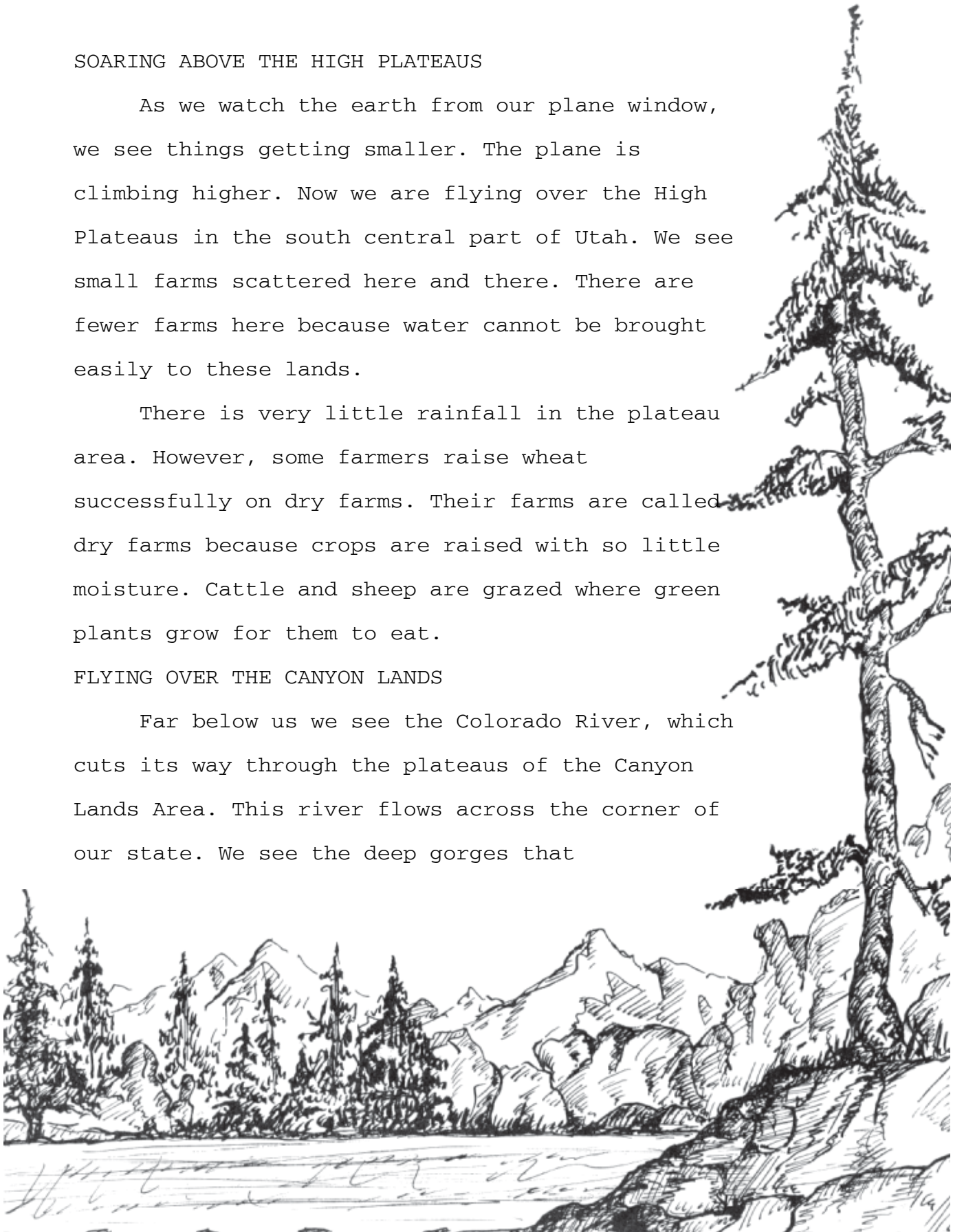
SOARING ABOVE THE HIGH PLATEAUS

As we watch the earth from our plane window, we see things getting smaller. The plane is climbing higher. Now we are flying over the High Plateaus in the south central part of Utah. We see small farms scattered here and there. There are fewer farms here because water cannot be brought easily to these lands.

There is very little rainfall in the plateau area. However, some farmers raise wheat successfully on dry farms. Their farms are called dry farms because crops are raised with so little moisture. Cattle and sheep are grazed where green plants grow for them to eat.

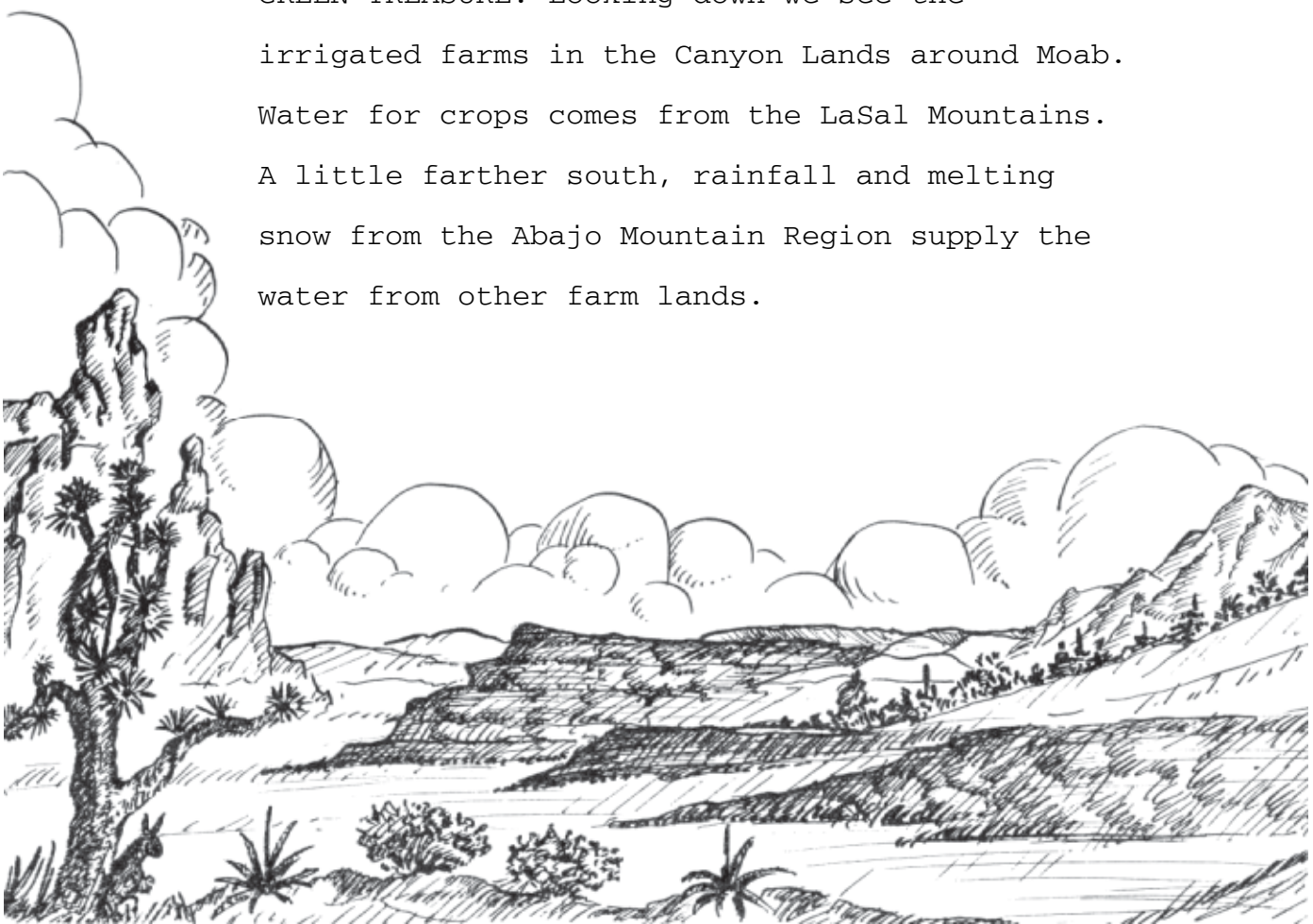
FLYING OVER THE CANYON LANDS

Far below us we see the Colorado River, which cuts its way through the plateaus of the Canyon Lands Area. This river flows across the corner of our state. We see the deep gorges that



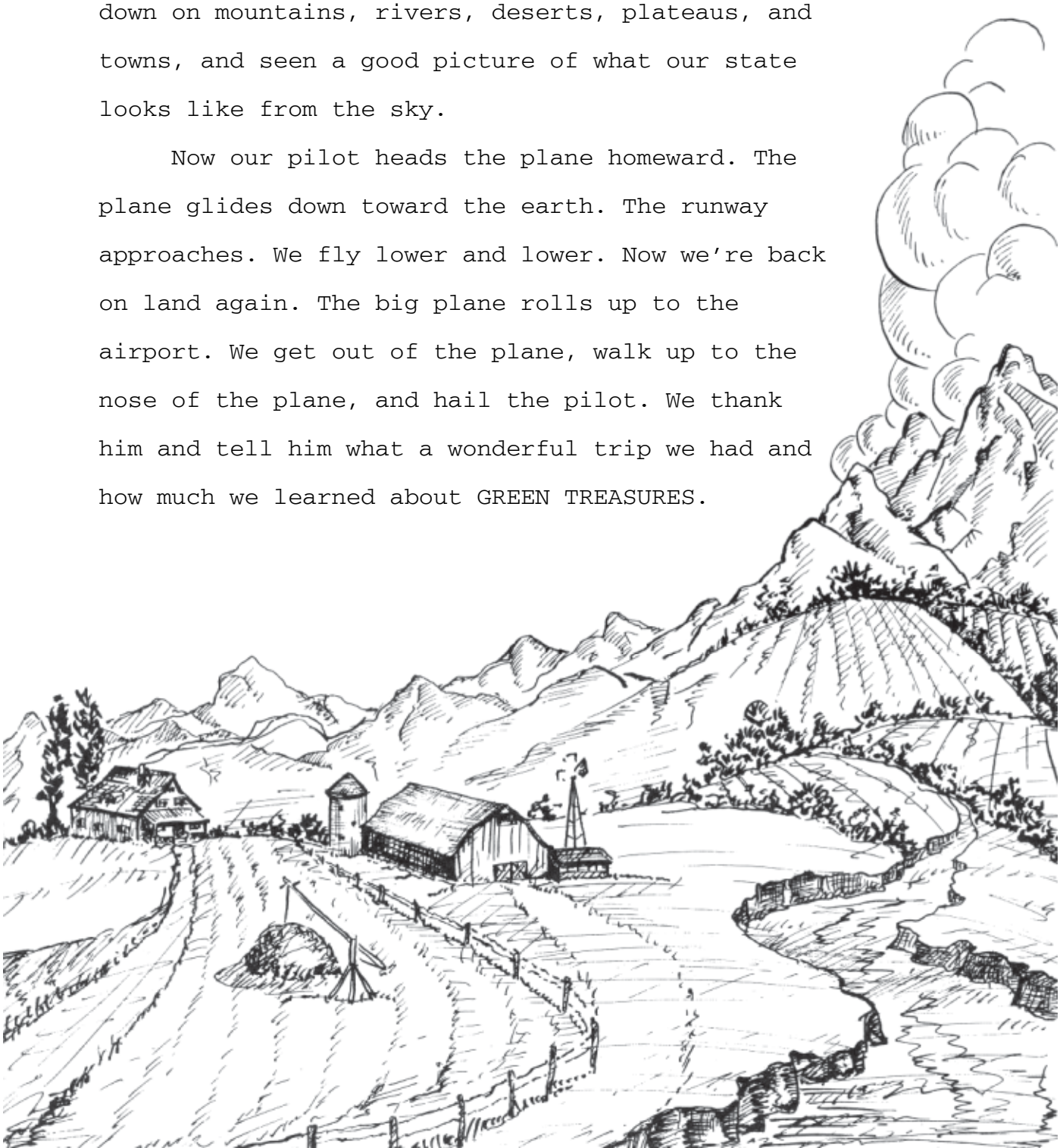
its waters have cut into the earth. The river is so far below the level of the farm lands that it is impossible to use its main flow of water for irrigation. Only parts of some of its tributaries can be used for irrigating farm lands. It's main stream flows into Arizona, where the famous Grand Canyon National Park is located. This canyon is one of the Seven Wonders of the World. See if you can trace the courses of these rivers on a map of Utah.

Now our pilot tells us to look for more GREEN TREASURE. Looking down we see the irrigated farms in the Canyon Lands around Moab. Water for crops comes from the LaSal Mountains. A little farther south, rainfall and melting snow from the Abajo Mountain Region supply the water from other farm lands.



Our hunt for GREEN TREASURE has been successful. We have discovered farms and crops and grazing lands. From high in the air we have looked down on mountains, rivers, deserts, plateaus, and towns, and seen a good picture of what our state looks like from the sky.

Now our pilot heads the plane homeward. The plane glides down toward the earth. The runway approaches. We fly lower and lower. Now we're back on land again. The big plane rolls up to the airport. We get out of the plane, walk up to the nose of the plane, and hail the pilot. We thank him and tell him what a wonderful trip we had and how much we learned about GREEN TREASURES.



CLIMATE AND GREEN TREASURE

After our airplane hunt for GREEN TREASURE, it is easier for us to understand why plants grow in some places and not in others. Plants that we use for food cannot grow in some desert lands. Mountain areas cannot grow in some desert lands. Mountain areas cannot be used for raising crops for food. The plateaus and deep canyon lands are other places where food crops will not grow. GREEN TREASURE is found only where there is good soil, where there is enough moisture, and where the climate is just right for plants to grow.

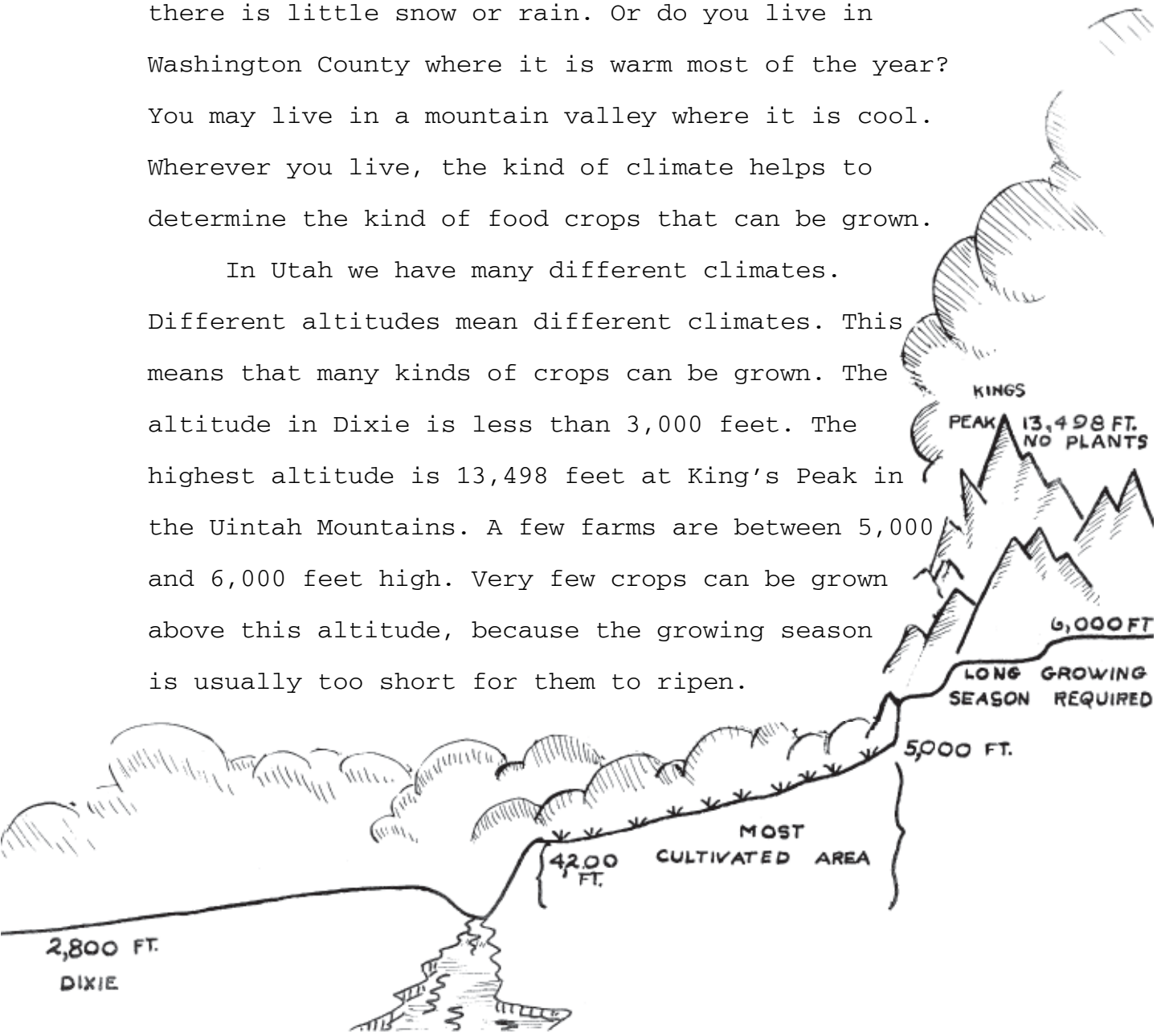
What kind of climate do we find in Utah? The days are sunny and the nights are cool. There are little fog and wind. Rainfall in the desert regions is only about five inches a year. Yet in the high mountains as much as forty inches of rain may fall in one year. The average for the whole state is thirteen inches. So parts of the state are wet much of the time. Other parts are dry most of the time.

Few states have such a big difference in amount of rainfall. The least amount of rain falls in Nevada, about nine inches a year. In Louisiana about fifty-five inches falls during

the year. The place with the most rain anywhere in the world is Cherrapunji, India — 426 inches falls in one year!

What is the climate like where you live? You may live near the mountains where there are much snow and rainfall. Perhaps you live in a desert region where there is little snow or rain. Or do you live in Washington County where it is warm most of the year? You may live in a mountain valley where it is cool. Wherever you live, the kind of climate helps to determine the kind of food crops that can be grown.

In Utah we have many different climates. Different altitudes mean different climates. This means that many kinds of crops can be grown. The altitude in Dixie is less than 3,000 feet. The highest altitude is 13,498 feet at King's Peak in the Uintah Mountains. A few farms are between 5,000 and 6,000 feet high. Very few crops can be grown above this altitude, because the growing season is usually too short for them to ripen.



SOIL AND GREEN TREASURE

Why do plants need good soil? What would happen if there were no green plants for us to use as food? What would happen to the animals we use for meat? They live on GREEN TREASURE too.

If you were to dig down toward the center of the earth, you might find layers of earth much like those you see named on this page. The first layer is called the topsoil. In some places this is only a very thin layer. Most of the plants we raise as food grow in the topsoil. Good soil is necessary for plants to grow well.

Below the topsoil there is a layer of clay. In some places in Utah this layer is only several inches deep. In other places this layer of clay may be several feet deep.

Below the clay you would find a layer of soft rocks. Some of the rocks would be very small like gravel. Others would be much larger.

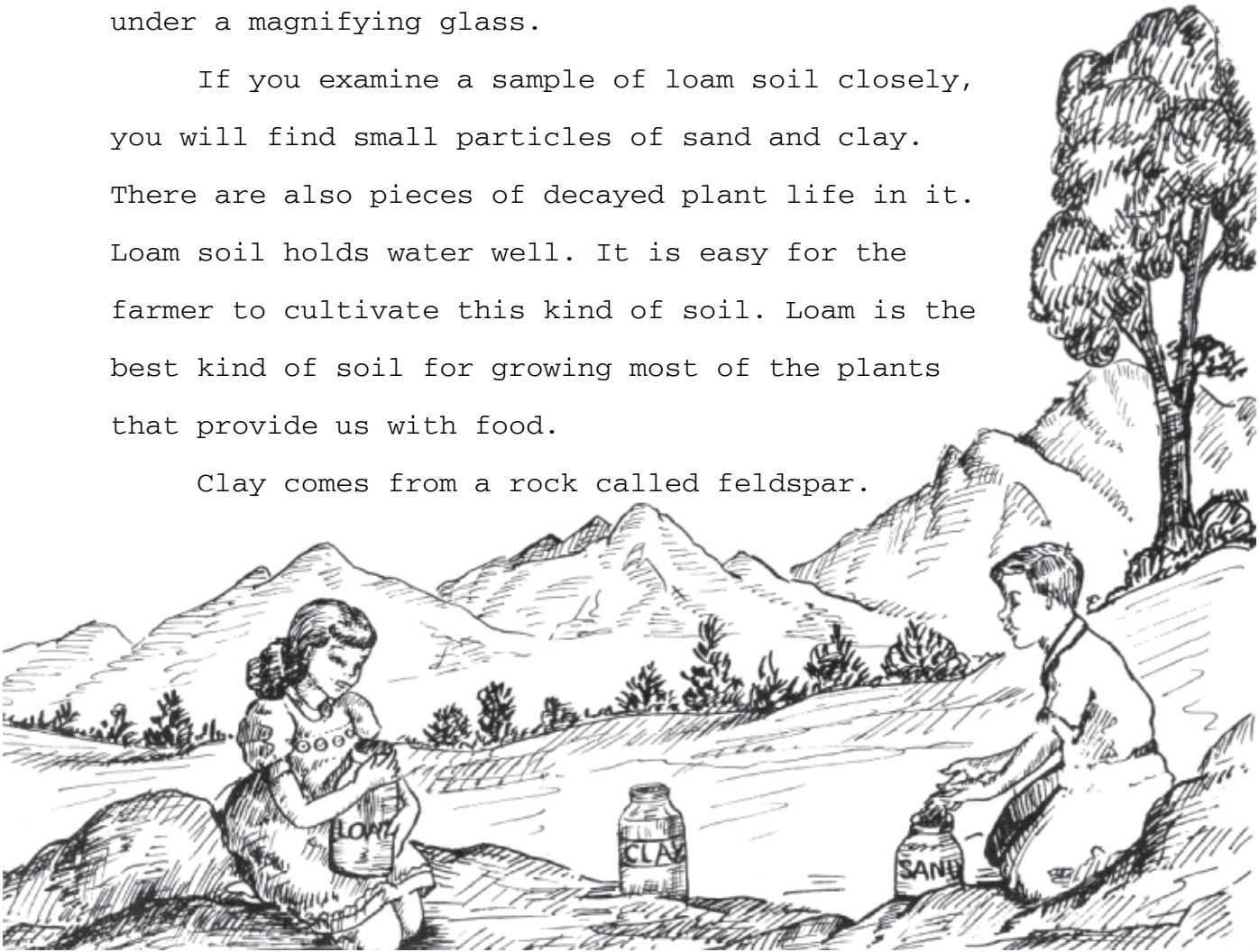
If you could dig much deeper, you would finally hit hard, solid rock.

The soil on the surface of our earth is made from decayed rock or from rock that has been broken up into little pieces by wind or water. Scientists say that it takes from 500 to 1,000 years to make one inch of topsoil. The soil is like the rock from which it is made. That is why we have clay, loam, and sandy soils.

If you examine these soils, you will find tiny particles of the rock from which they were made. Bring in some samples of soil. Look at them under a magnifying glass.

If you examine a sample of loam soil closely, you will find small particles of sand and clay. There are also pieces of decayed plant life in it. Loam soil holds water well. It is easy for the farmer to cultivate this kind of soil. Loam is the best kind of soil for growing most of the plants that provide us with food.

Clay comes from a rock called feldspar.



The particles that make up the soil are tiny and smooth. Clay soils hold a large amount of water. When clay is wet, it feels sticky. Water moves through the soil slowly because the particles of clay are so close together. It is difficult for most plants to grow in this kind of soil. Their roots can get little air from the soil.

Sandy soils are made up of tiny particles of sand. They are loosely packed and do not hold water well. The water runs off quickly and it soon dries out. Because plants need lots of moisture found in the soil, they do not grow well in sandy soils.

A farmer knows which crops will grow best on his lands. That is one of the reasons that we find GREEN TREASURES growing in certain parts of Utah.

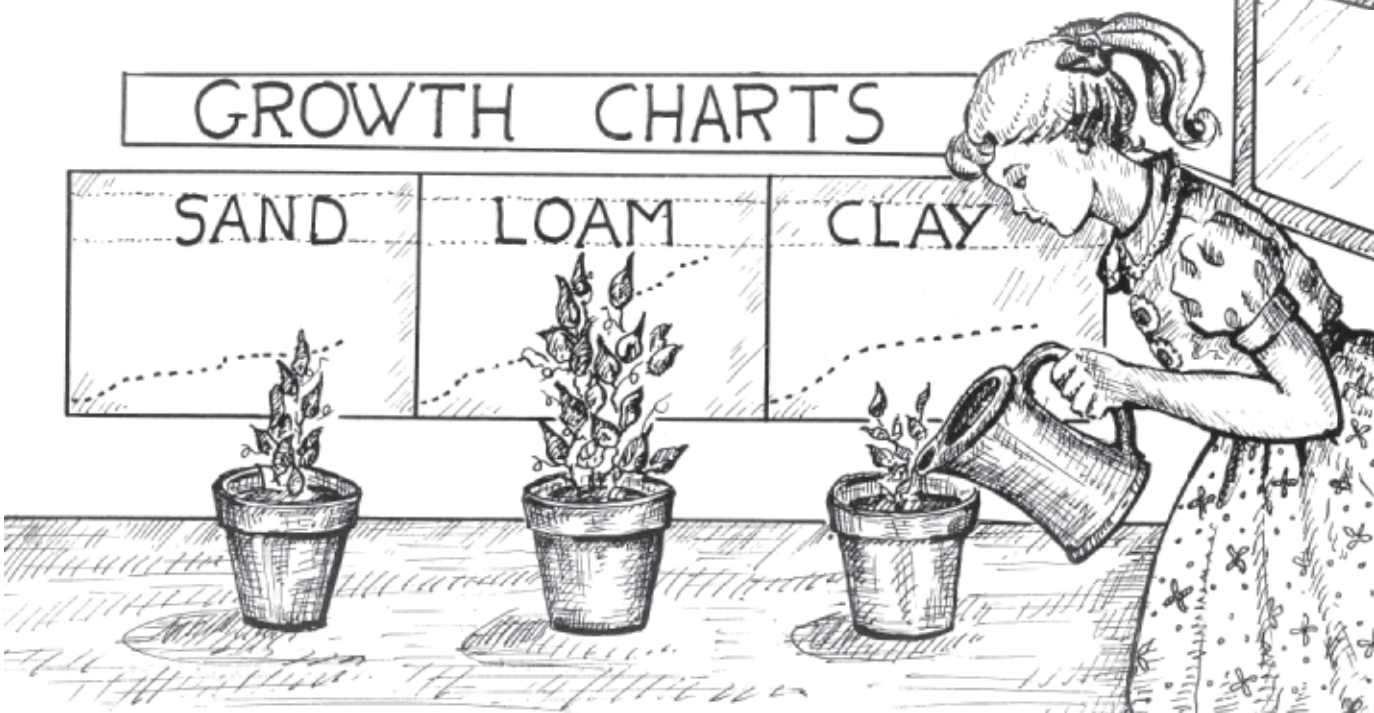
You might experiment with different kinds of soils to find out which soil will produce the best plants. This is what you will need to do: Make a trip outdoors to collect some of the different types of soil that you can find in your neighborhood.

These hints will help you find different kinds of soil: Loam soils can usually be found

in a garden producing healthy plants. If you see a place where the soil is cracked and hard, it will probably be clay soil. Try to find some soils that have recently been fertilized.

Collect as many different types as you can. Put the soils in different containers. Flower pots are one of the best kind to use. Label each one with the type of soil it contains.

Bring some seeds from home. Bean or pea seeds are good to use. Soak the seeds overnight. This will make them sprout more quickly. Now plant two seeds in each container. Keep the soil moist. Be sure to put them in a place where they will get plenty of sunlight. Keep a record or chart of your plant experiment.



HOW SOIL IS DAMAGED

You have learned why we need the soil. But do you know how it is damaged? Perhaps you wonder what happens to it.

Soil is sometimes washed away or eroded by water. When it rains, the water runs over the ground quickly. When this happens, it washes away the topsoil. If there is not a good cover of plants and grasses on the ground, melting snow water will run over the earth quickly. It will carry some of the soil along.

Do you see how the soil has been washed away in the picture? A deep gully has been made by water running over this area. We cannot find GREEN TREASURE here.

Wind also carries away soil. There are bare spots of earth. GREEN TREASURE cannot grow here either. The wind very easily picks up tiny particles of earth from bare places. It carries this soil away. Sometimes it is deposited hundreds of miles from where it was picked up. Some farms, like the one below, are very badly damaged by wind.

Have you ever thought that cattle and sheep also destroy soil? In places where there are too many cattle and sheep grazing, the GREEN TREASURE growing there is soon killed by their trampling feet. When this happens, the topsoil is soon carried away by wind or washed away by water. The land can no longer be used for good grazing.

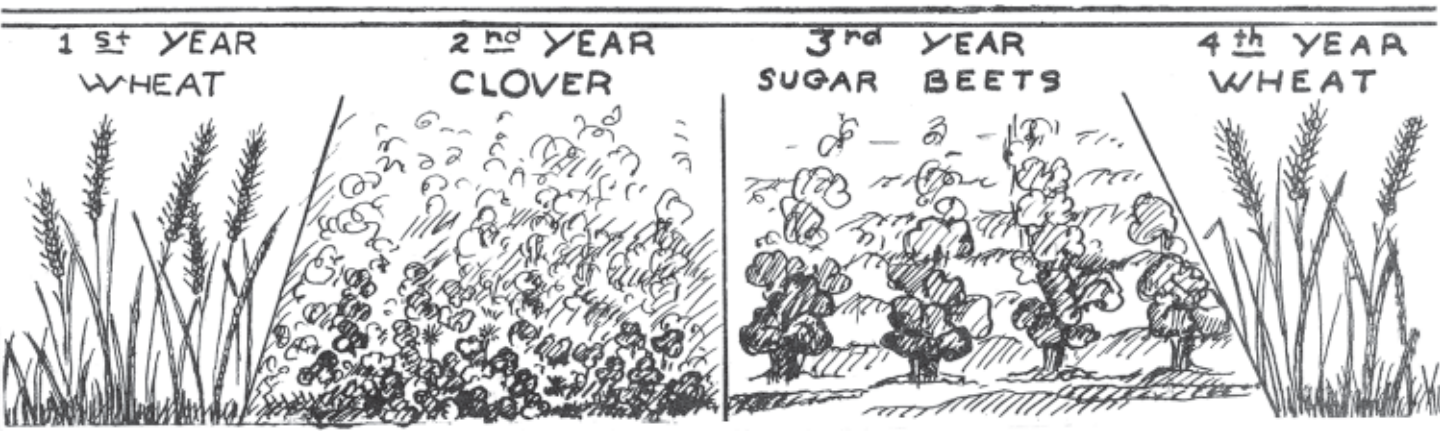
PROTECTING THE SOILS

Our farmers must take very good care of their soils if they want to grow GREBN TREASURES. To keep soils from washing away or being carried away and from wearing out, they must use many scientific ways of farming.

One of the best ways to keep the soil from wearing out is rotating crops. Many farmers in Utah make use of this practice. Crop rotation means planting different crops over the period of years on the same piece of land.

A farmer may plant wheat on his land. Later he may plant clover on the same land. Clover is used on soil that is badly damaged. It is usually left for at least two years. Then it may be plowed under as green manure. Alfalfa is another plant that is often rotated with other crops. It is usually allowed to stand from three to seven years.

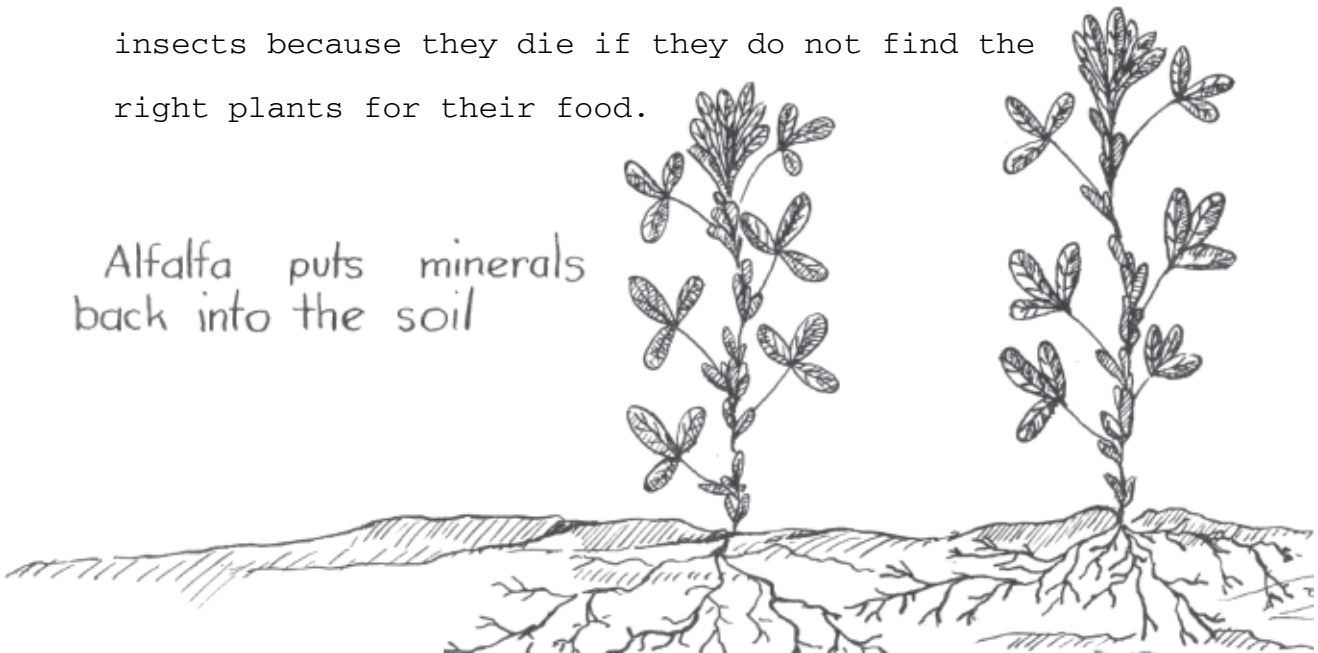
Plants that are used in crop rotation for four years

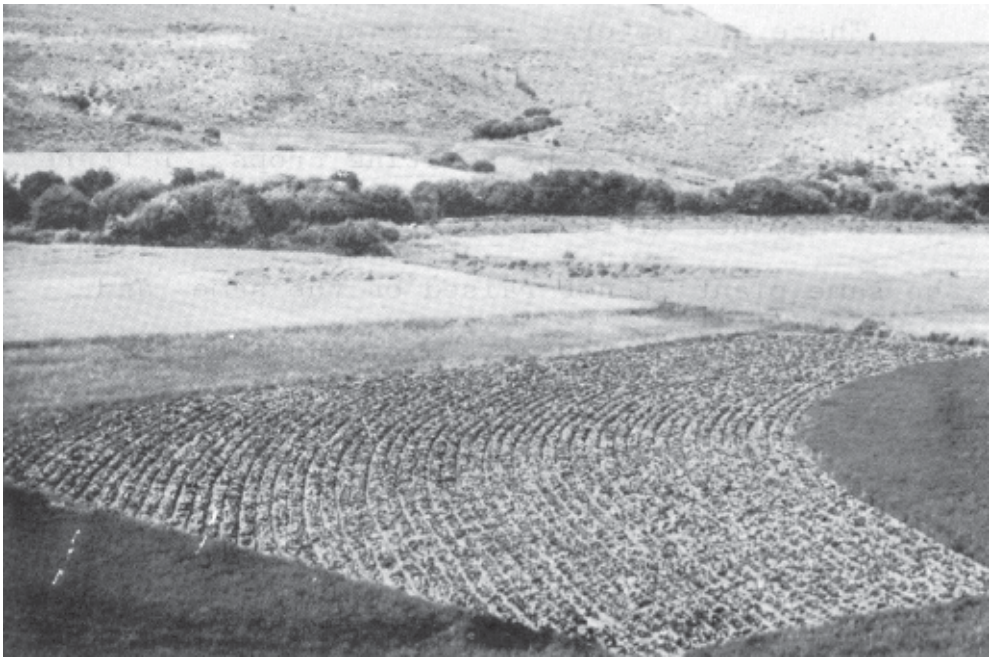


There are several reasons why the farmer finds it useful to rotate crops. Better GREEN TREASURES are raised by rotating crops. Different plants may use different parts of the soil. If the same plant is not raised on the same land year after year, there is less chance of the soil's being depleted of some special part needed by the plant. Some crops, like clover, put certain plant foods back into the soil.

Another way to protect the soil is plowing under the soil frequently. This helps the farmer get rid of weeds. Weeds take a lot of moisture and minerals from the soil. When the weeds are destroyed, plants can use this water and minerals for their growth.

Some insects injure certain GREEN TREASURES and not others. Crop rotation helps to get rid of insects because they die if they do not find the right plants for their food.





Contour plowing is an easy way of preventing water from washing away farm lands. Water runs very quickly down rows that have been plowed up and down on a slope. It also carries much of the top soil with it. Notice how the farm in the picture above has been plowed. This land has been plowed around the slope or on the contour. Plowing the land this way makes small dams. The dams hold the water on the land long enough for it to soak in. When water soaks into the ground, it will not run off and carry the topsoil with it. It will also provide more moisture for GREEN TREASURES.

Do you see how the crops in the picture above were planted? Perhaps a farm you have visited had the crops planted this way. This is called strip planting. It is another way farmers use to prevent soil erosion. In using this method, the farmer may plant a strip of oats. Then he may plant a strip of grass. Then he may plant a strip of oats and another strip of grass and so on until his field is planted. The plants growing in each strip help to hold most of the water that falls on the strip. If the plants cannot hold all the water, the next strip slows down the flow of water. Then little soil is washed away. GREEN TREASURES help to hold the soil.

Strip planting will prevent damage to the soil by the wind as well as by water. To do this, the farmer plants a row of trees or bushes to act as a windbreak. He plants these in turn with rows of crops.

Thick growing crops planted so that they will hold the soil in place are called cover crops. These are used when there are few or no other plants to protect the soil from erosion. Grasses, trees, and clover are used for cover crop. The picture below shows a cover crop growing in an orchard. Grasses and clover have been planted here. This is done frequently in Utah.

Cover crops keep the soil from washing away and provide plant food for the trees. These grasses are not cut until they are about three feet tall. Then they are left to rot and decay on top of the ground. They are changed by bacteria into humus and plant food.

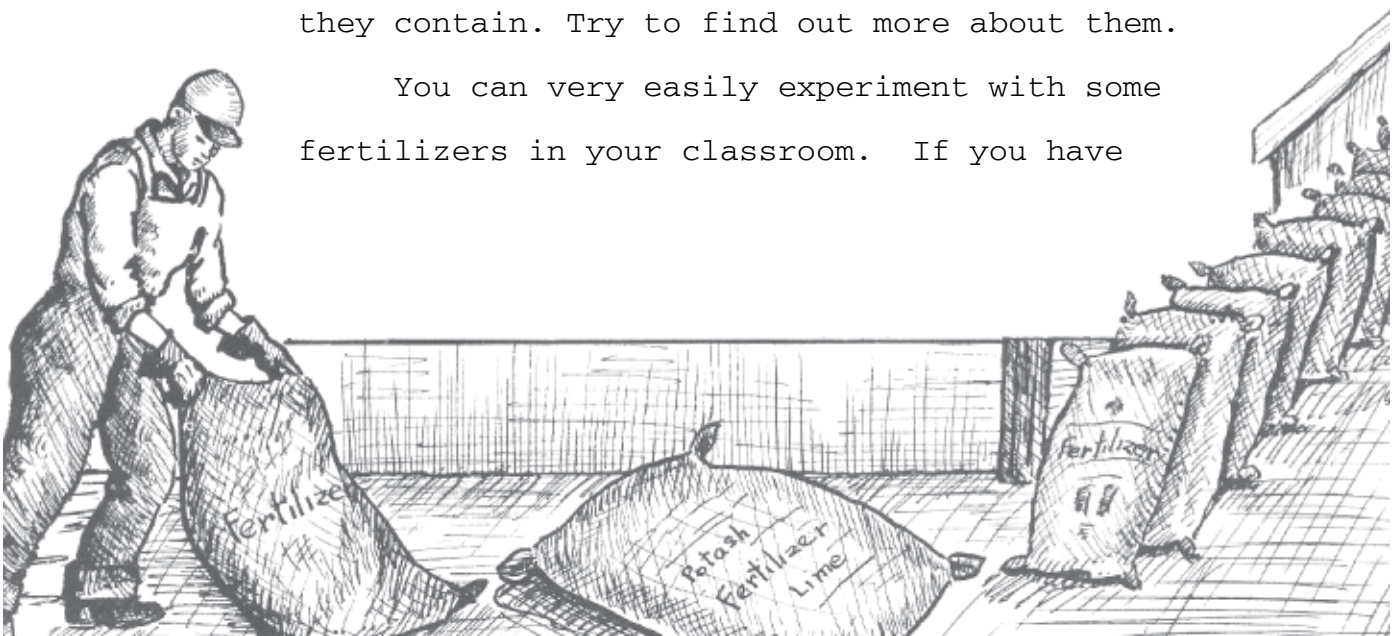
In some places farmers leave parts of their land unplanted every other year. They plow in the stubble that remains from the crops. Look at the picture below. You can see the stubble in this field that has been plowed under. This practice helps to build up the soil. It also prevents the soil from being washed or blown away.

Sometimes people say that the soil is "worn out." This means that it no longer contains certain foods that plants need. Fertilizing the soils will restore the foods that the plants have used. Fertilizers are "food" for GREEN TREASURES.

Often farmers find it necessary to use a commercial fertilizer to replace some of the necessary foods. They are used to take the place of or restore foods that are used by GREEN TREASURES. Phosphoric acid, potash, and lime are foods that frequently need to be added to the soil.

If you have a garden or if you raise GREEN TREASURES on a farm, you probably have some fertilizers. Look on the package that these fertilizers are in to see which foods they contain. Try to find out more about them.

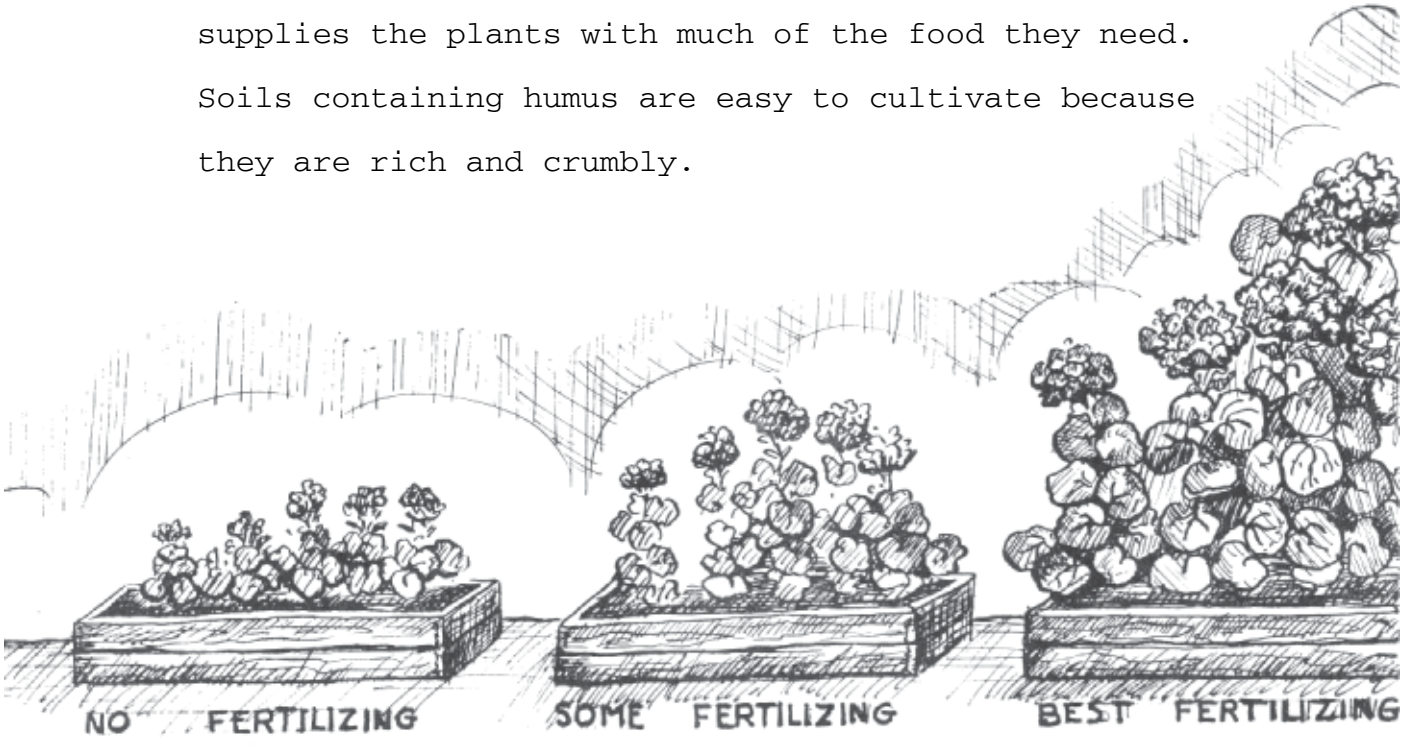
You can very easily experiment with some fertilizers in your classroom. If you have



more than one type of fertilizer, add one kind to each plant. Label the plant with the kind of fertilizer you have added. Do not add fertilizer to one plant.

After about a week see if you can observe any differences in the plants that have had fertilizers added. Are the leaves of the plants greener? Are there differences in the way the plants grew?

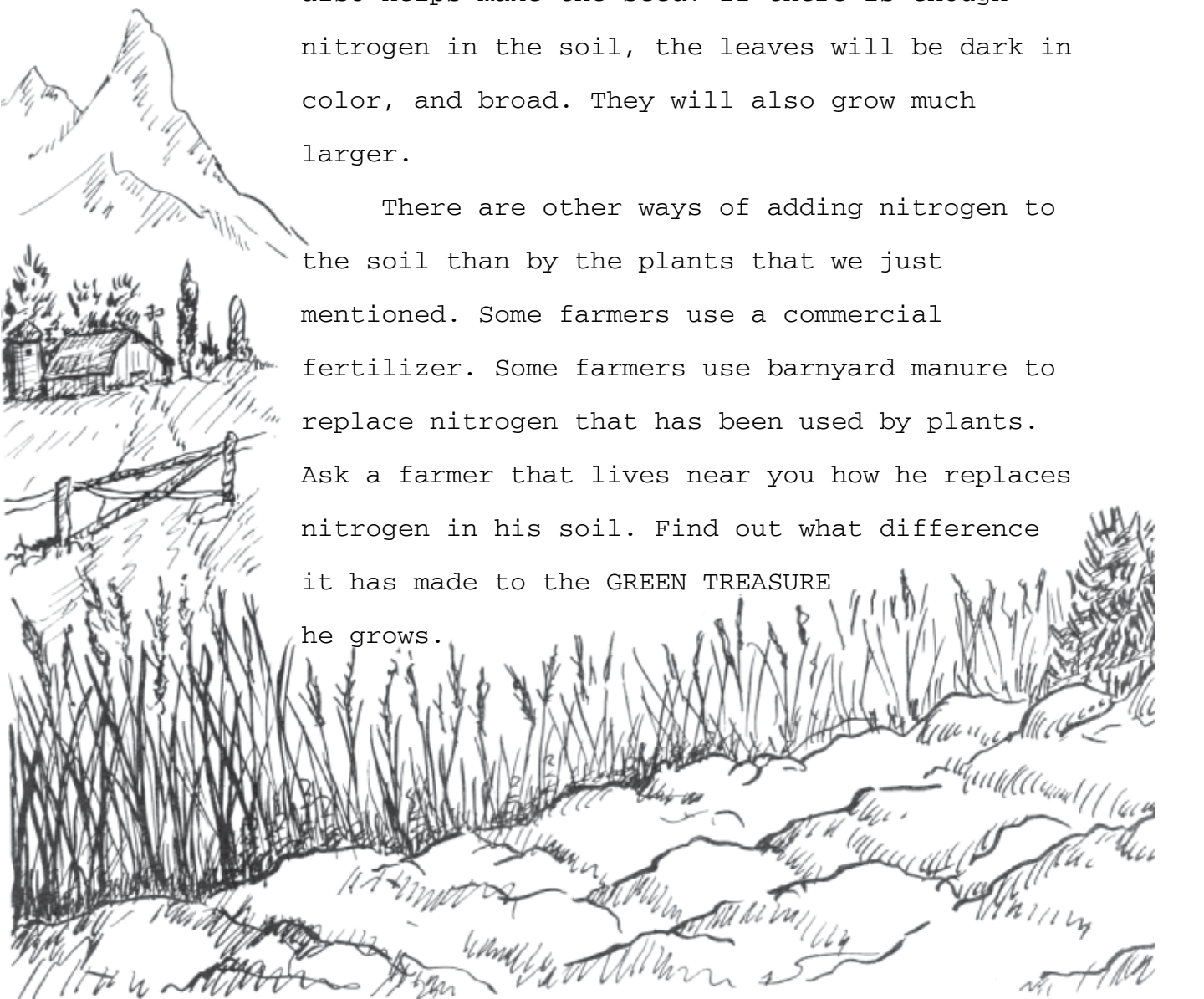
Most good soils contain humus. Humus is decayed vegetable matter that comes from the leaves of trees, grasses, weeds, and plants. Insects, worms, and animals, after they are dead, become a part of the soil. They become humus with the help of bacteria. Humus makes the soil act like a sponge and holds moisture for the growing plants. It supplies the plants with much of the food they need. Soils containing humus are easy to cultivate because they are rich and crumbly.



Farmers replace the humus in several ways. One way is by spreading straw, manure, or other vegetable matter on top of the soil. This is plowed under. Another way is by planting some crops such as peas, alfalfa, clover, and soybeans. These crops add vegetable matter and nitrogen to the soil.

Nitrogen makes the plants grow rapidly. It also helps make the seed. If there is enough nitrogen in the soil, the leaves will be dark in color, and broad. They will also grow much larger.

There are other ways of adding nitrogen to the soil than by the plants that we just mentioned. Some farmers use a commercial fertilizer. Some farmers use barnyard manure to replace nitrogen that has been used by plants. Ask a farmer that lives near you how he replaces nitrogen in his soil. Find out what difference it has made to the GREEN TREASURE he grows.



WATER FOR GREEN TREASURE

You have learned that GREEN TREASURES need good soil and the right kind of climate to grow well. Water is also important to GREEN TREASURES.

In some places GREEN TREASURES get all the water they need from rain. This is not so in Utah. Our main supply of water comes from the snow and rain that fall in the high mountain areas. This moisture comes in the wrong place and at the wrong time for growing our food crops.

In the spring the melting snow waters flow into creeks and rivers. The trees you see in the picture help to prevent spring floods. The grasses and plant litter under the snow and the humus in the soil help the melting snow to soak into the earth. This prevents the water from rushing over the ground and carrying valuable topsoil with it.

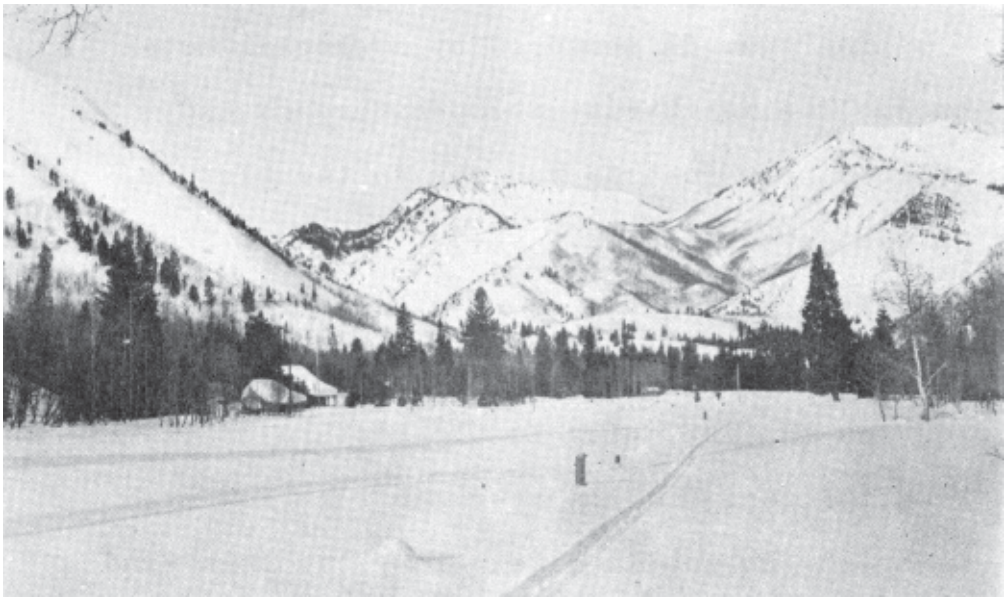
SNOW SURVEYING

Did you know that some people can tell exactly how much water there is in the snow that falls each winter? It is necessary that we know and can tell how much water will be available for us to use throughout the year. A system of snow surveying is used to measure the amount of water in the snow.

Snow surveying is difficult and dangerous. There are men like the one you see in the pictures who measure the snow in the wintertime. These men select the snow course. The snow course is a place where the snow does not melt during the wintertime. In Utah this means that it must be taken at an elevation of about 8,000 feet.

The snow is measured by a special metal tube. The men thrust it down through the crusted snow just as you see in the picture on the opposite page. They do this to find out exactly how deep the snow is. Then they weigh the snow that is inside the metal tube just as you see the man doing in the picture below. From this information they can tell how much water the snow will make. They can then find out how much water to expect the next summer for our crops and for use in our cities and towns.

The farmer can find out whether or not there will be enough water to raise the GREEN TREASURES he wants to plant.



WHERE SNOW AND RAIN FALL

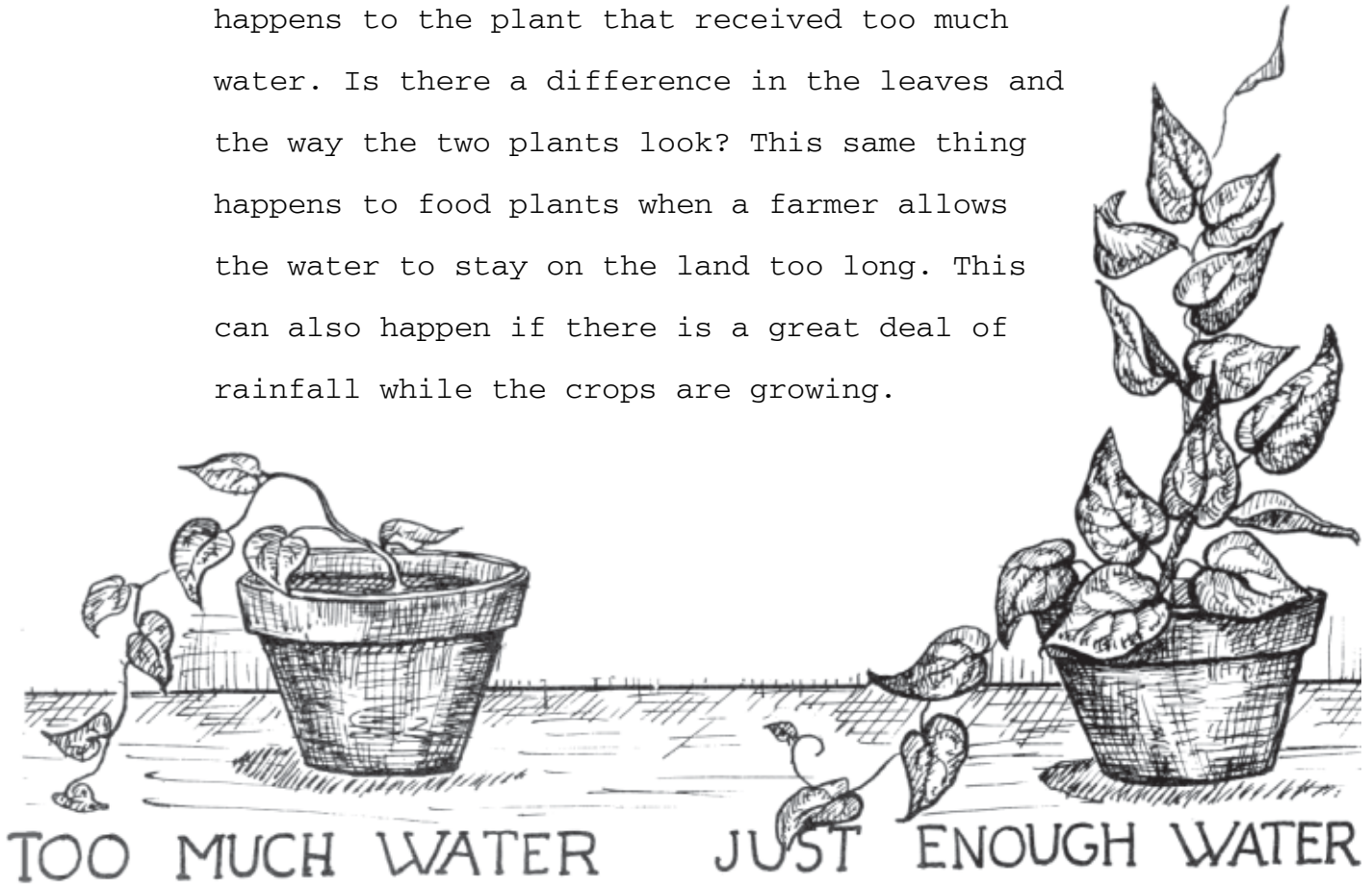
The amount of water that finally comes down to the valleys and can be used depends upon the watershed. A watershed is the land on which snow and rain fall. Some watersheds are only a small area of land. Others, like the one you see above, cover many acres of land.

To be in good condition a watershed must be covered with plant growth. The soil must contain humus and roots that help the water soak into the ground. Some water enters the soil and is stored for plants to use. Part of the water evaporates. The rest flows down slowly to feed streams.

If there are few plants on the watershed, it may cause floods in the spring. This results in the loss of valuable topsoil.

Too much water is not good for some plants. Roots need air. If water fills up the spaces in the soil for a long time, the roots die from lack of air. In some places the farmers have to drain their land to carry away some of the water.

You might like to find out what happens to plants when they have too much water. Get two healthy plants about the same size. Give one plant only the amount of water that it usually requires. Soak the other plant well. Keep it watered so much that the soil will not absorb all the water. In about a week see what happens to the plant that received too much water. Is there a difference in the leaves and the way the two plants look? This same thing happens to food plants when a farmer allows the water to stay on the land too long. This can also happen if there is a great deal of rainfall while the crops are growing.



STORING WATER FOR GREEN TREASURE

In the spring the melting snows flow down until they reach the rivers or streams. Then they carry the water on down the valley or to a storage reservoir.

A reservoir is an artificial lake. It was built by building a dam or a dike across the river. Water is backed up behind the dam. This forms an artificial lake.

Several storage reservoirs have been built in Utah. The Pineview Dam was built on the Ogden River. The Strawberry Reservoir empties into Spanish Fork River. Another reservoir was built near Provo on the Provo River. It is called the Deer Creek Reservoir. The Salt Lake Valley Aqueduct brings the water from this reservoir to Salt Lake Valley. This aqueduct is a large cement pipe through which the water flows. It is forty-one miles long. It supplies some of the water that is needed in Salt Lake Valley.

Engineers must do careful planning to build a reservoir. It also takes a great amount

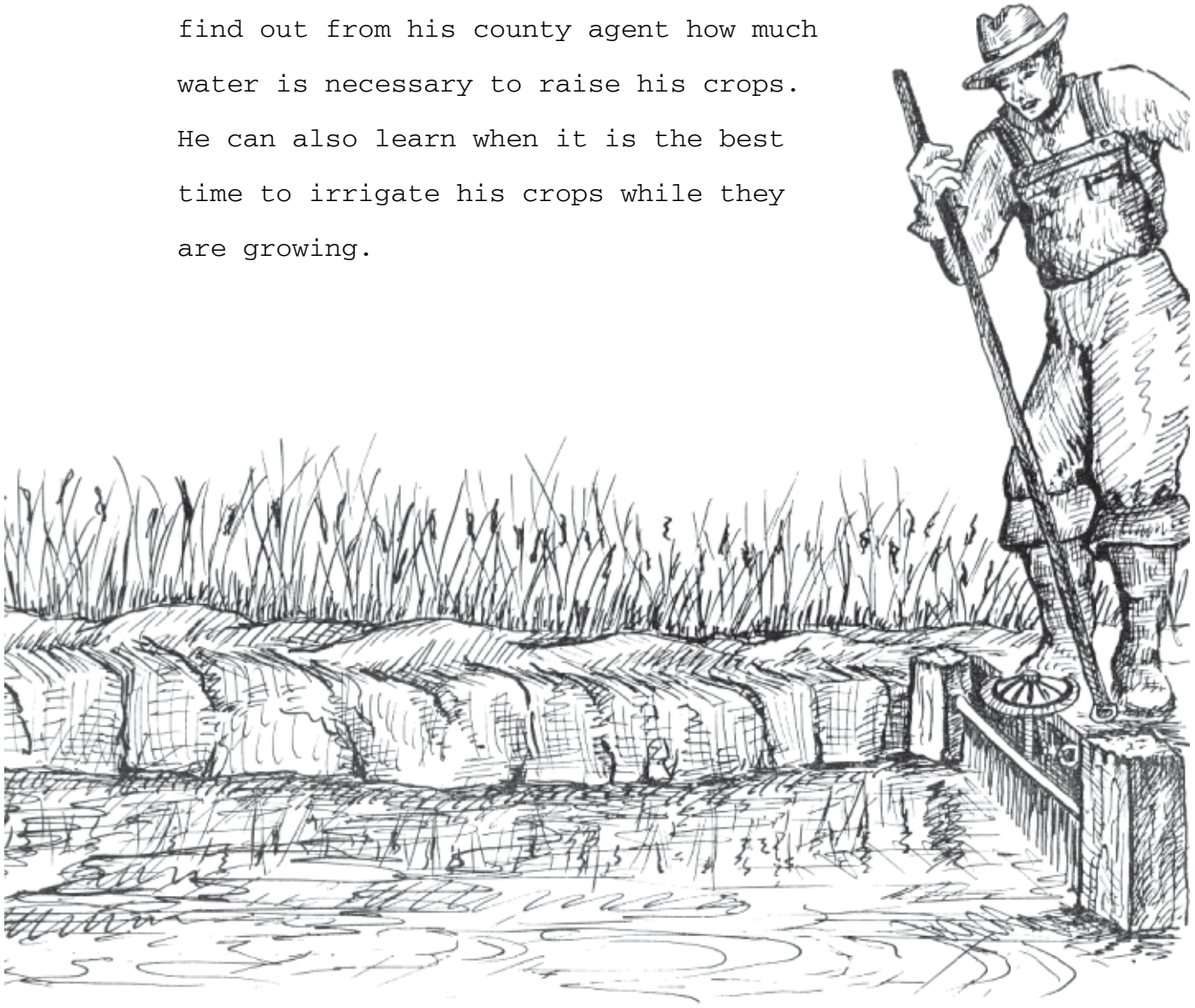
of money. Reservoirs are usually made of rock and dirt and are covered with cement. Tests are made in the solid rock and the surrounding ground to make sure that the dam will hold the water after it has been completed. The concrete must also be tested to see that it will be strong enough to hold great amounts of water.

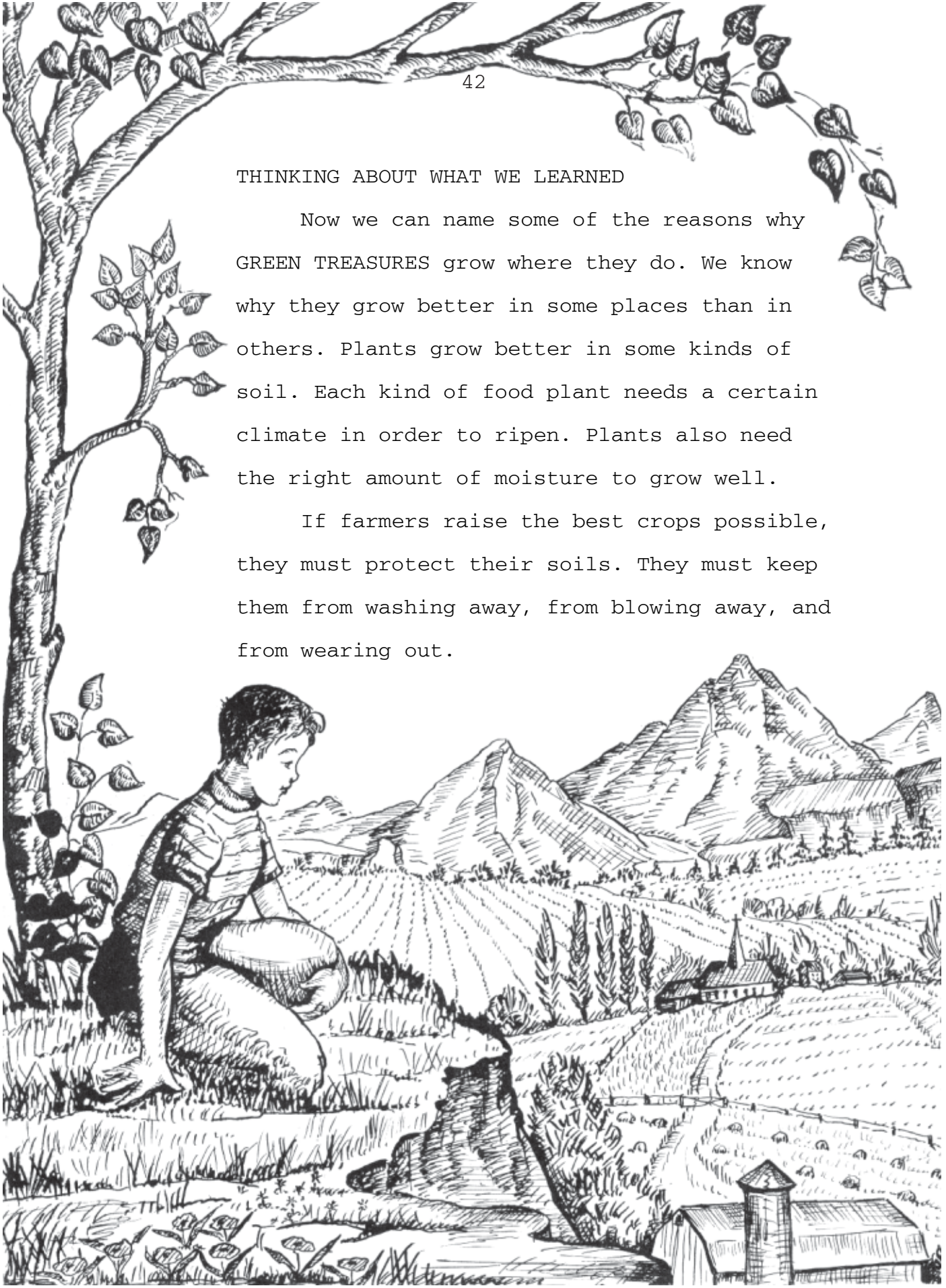
Some reservoirs store water for a long time. Other reservoirs hold water only until it is needed. Then the water flows into ditches or pipes and is carried to farming areas or to cities and towns. There are many of these smaller reservoirs located throughout the state. Find out whether there is a reservoir near where you live.

IRRIGATING LANDS

It is a problem to get the water from the natural streams and from reservoirs to farm lands. This must be done without losing precious water and soil. At first farmers dug ditches to carry the water. Now many of these ditches are lined with concrete, much like the one you see in the picture above. Using concrete prevents water from soaking into the soil and being wasted.

Knowing how to irrigate lands wisely is very important to a farmer who raises GREEN TREASURE. His crops must have enough water but they must not have more than the plants can use. A farmer tries to irrigate so that none of the water is wasted. He looks for new ways of bringing water to his lands. He can find out from his county agent how much water is necessary to raise his crops. He can also learn when it is the best time to irrigate his crops while they are growing.





THINKING ABOUT WHAT WE LEARNED

Now we can name some of the reasons why GREEN TREASURES grow where they do. We know why they grow better in some places than in others. Plants grow better in some kinds of soil. Each kind of food plant needs a certain climate in order to ripen. Plants also need the right amount of moisture to grow well.

If farmers raise the best crops possible, they must protect their soils. They must keep them from washing away, from blowing away, and from wearing out.

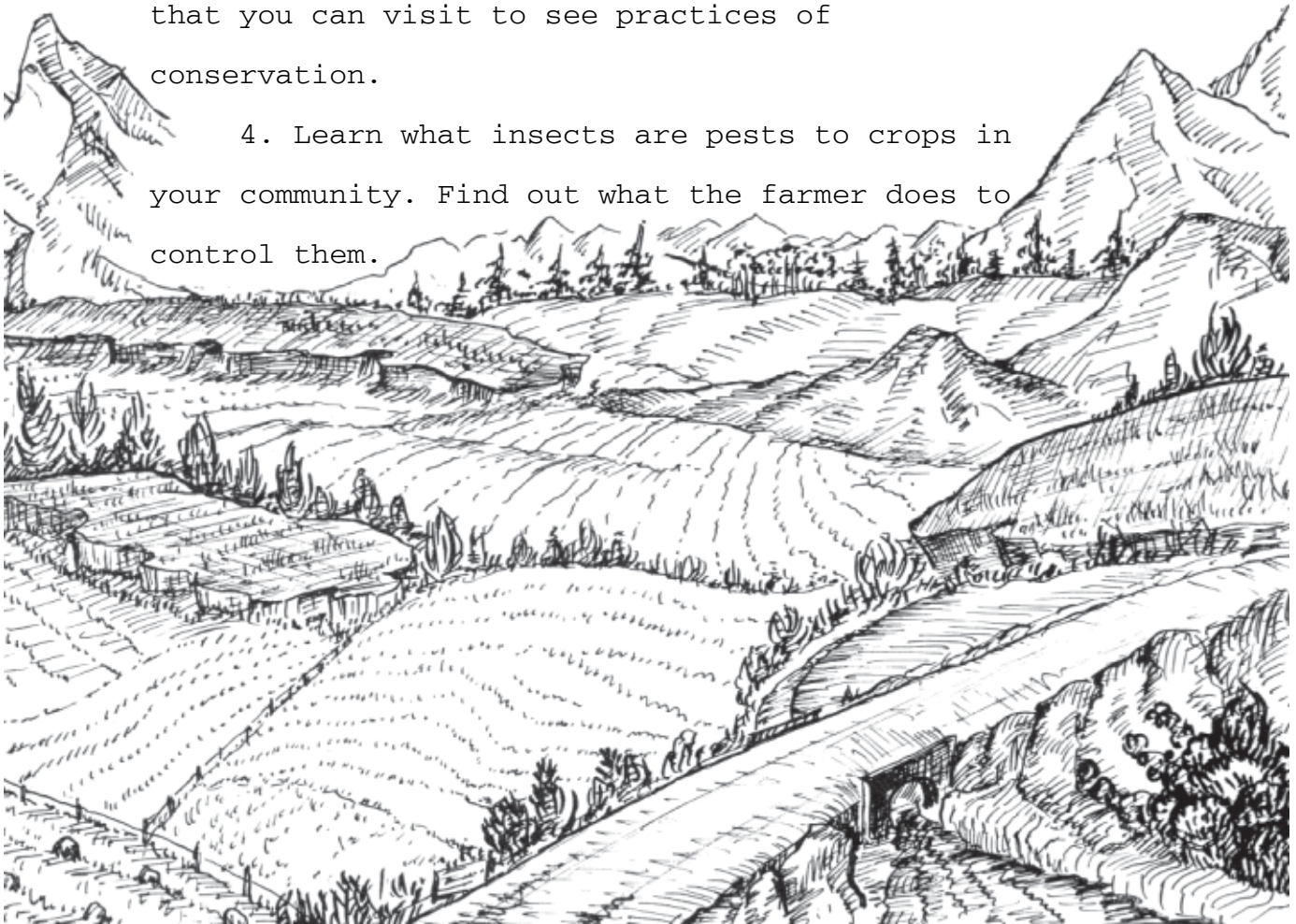
DISCOVERING NEW THINGS

1. Discover the effects of erosion by piling up some soft earth. Make a slope of the earth. Now make another one and cover this one with sod. Pour water over these little hillsides. See how much soil is washed down from the bare slope. Compare it with the soil from the sodded slope.

2. Invite your county agent or local soil conservationist to your class to talk about the need for and ways of using soil and water wisely in your community.

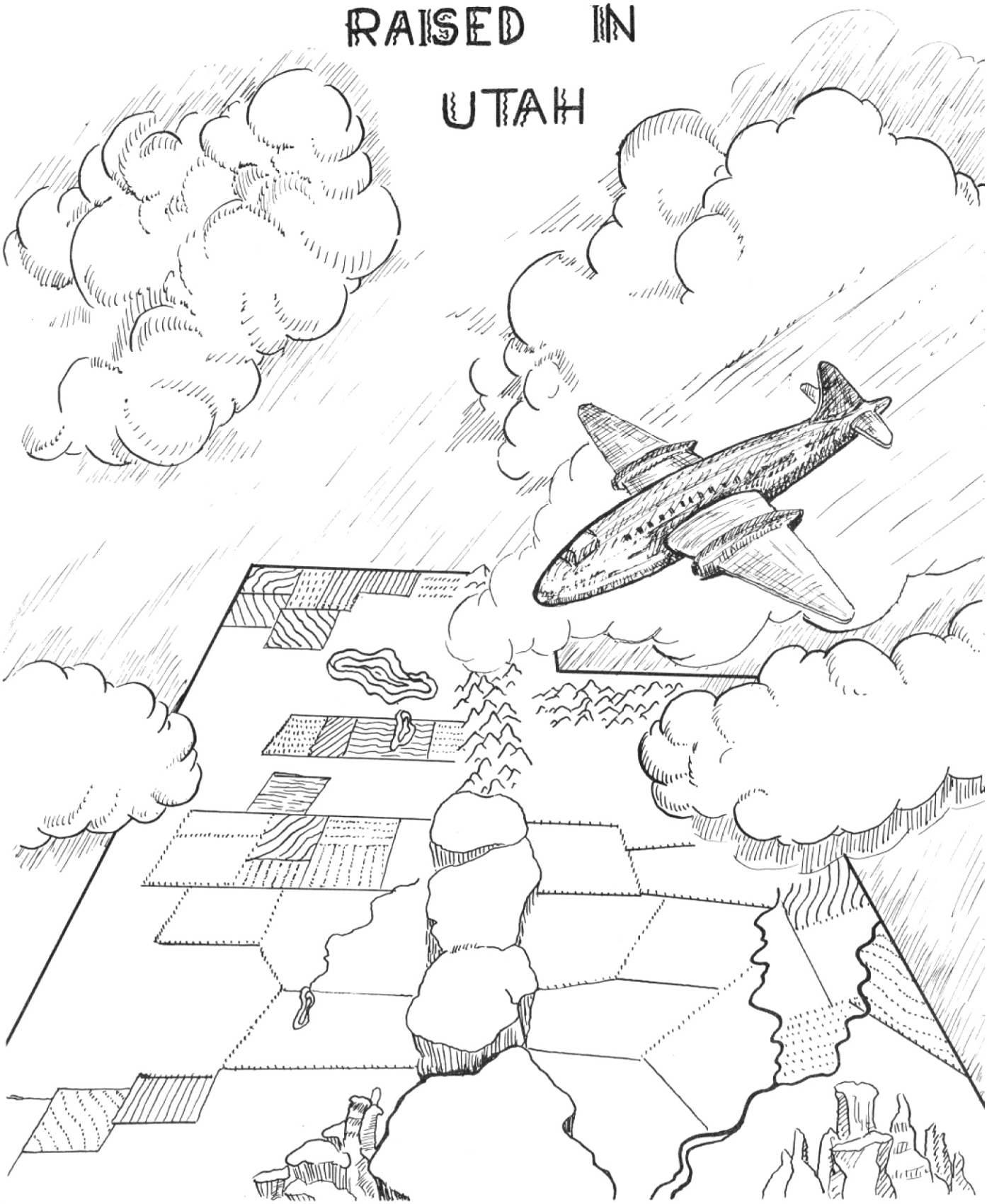
3. Find out where there is a farm near you that you can visit to see practices of conservation.

4. Learn what insects are pests to crops in your community. Find out what the farmer does to control them.



GREEN TREASURE

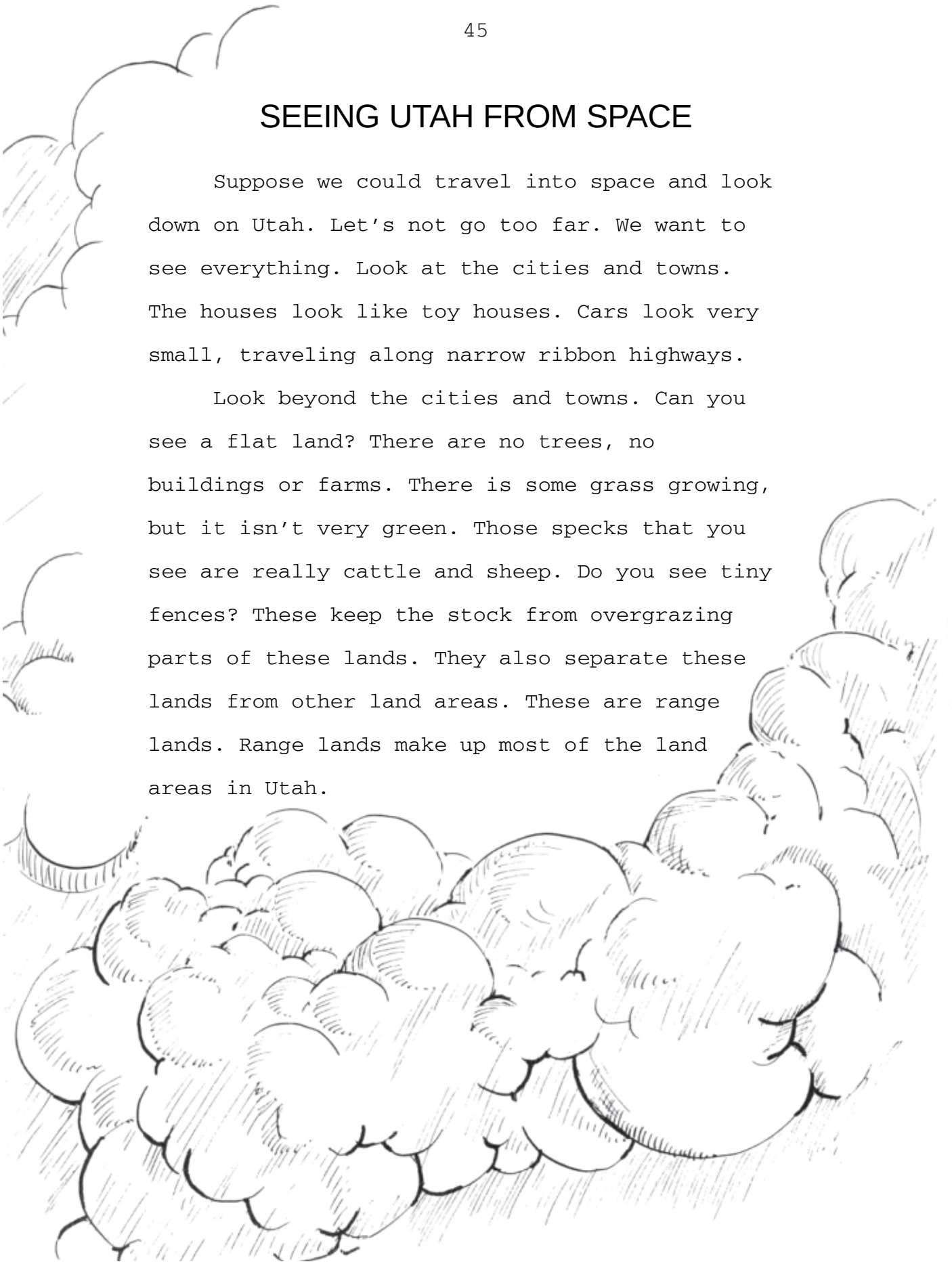
RAISED IN UTAH



SEEING UTAH FROM SPACE

Suppose we could travel into space and look down on Utah. Let’s not go too far. We want to see everything. Look at the cities and towns. The houses look like toy houses. Cars look very small, traveling along narrow ribbon highways.

Look beyond the cities and towns. Can you see a flat land? There are no trees, no buildings or farms. There is some grass growing, but it isn’t very green. Those specks that you see are really cattle and sheep. Do you see tiny fences? These keep the stock from overgrazing parts of these lands. They also separate these lands from other land areas. These are range lands. Range lands make up most of the land areas in Utah.



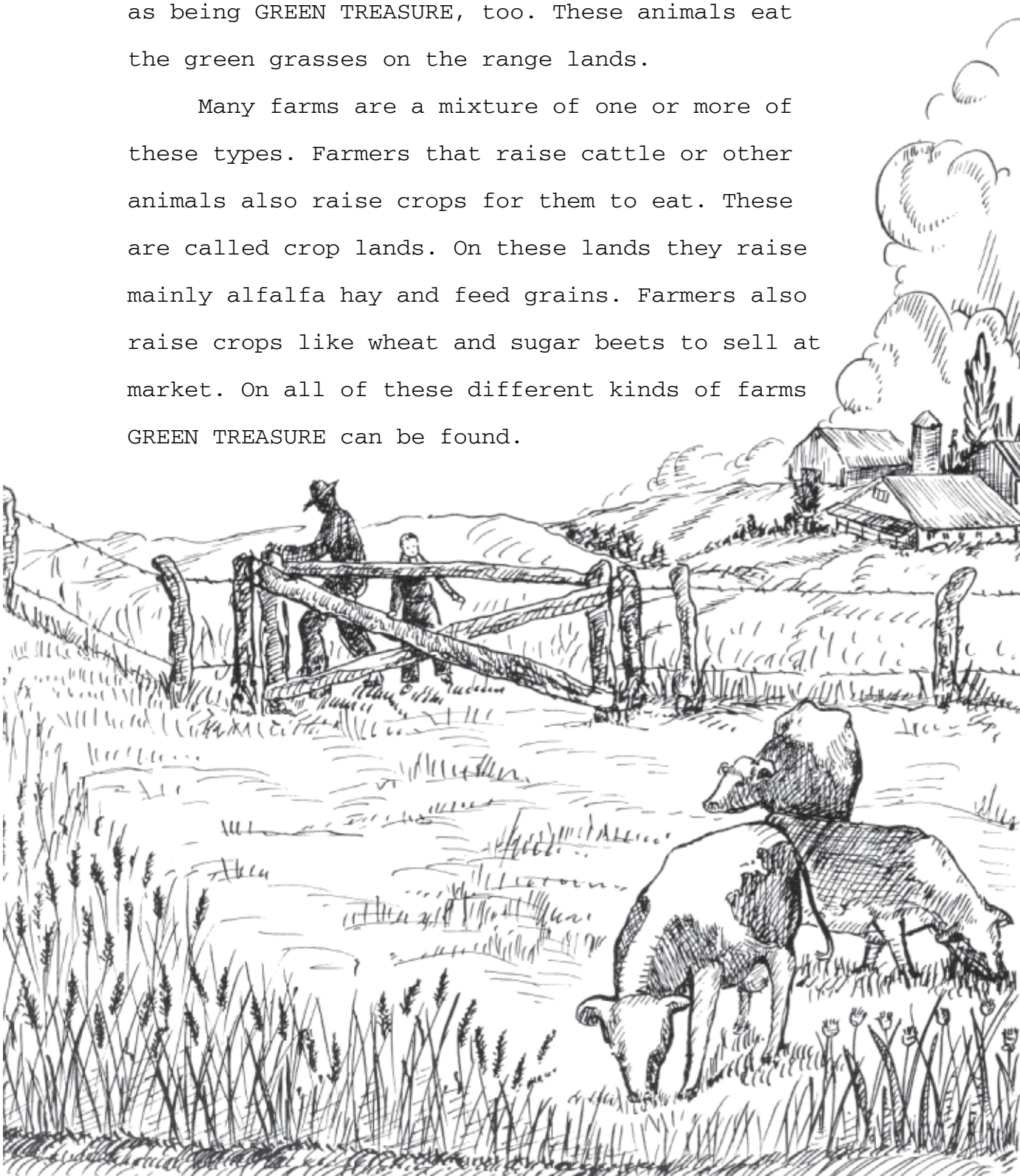
FARMS IN UTAH

Look near the mountain. You can see farms and orchards. These are irrigated farm lands. This is where some of Utah's GREEN TREASURE is grown. There are other little patches of green farm lands scattered here and there throughout the state. These are also irrigated farms.

Now do you see yellow patches of land? These are likely to be ripened wheat fields. Most of these lands are not irrigated. They are dry farm lands. They depend upon rain for moisture.

Some farms are range lands that provide food for cattle and sheep. We think of cattle and sheep as being GREEN TREASURE, too. These animals eat the green grasses on the range lands.

Many farms are a mixture of one or more of these types. Farmers that raise cattle or other animals also raise crops for them to eat. These are called crop lands. On these lands they raise mainly alfalfa hay and feed grains. Farmers also raise crops like wheat and sugar beets to sell at market. On all of these different kinds of farms GREEN TREASURE can be found.

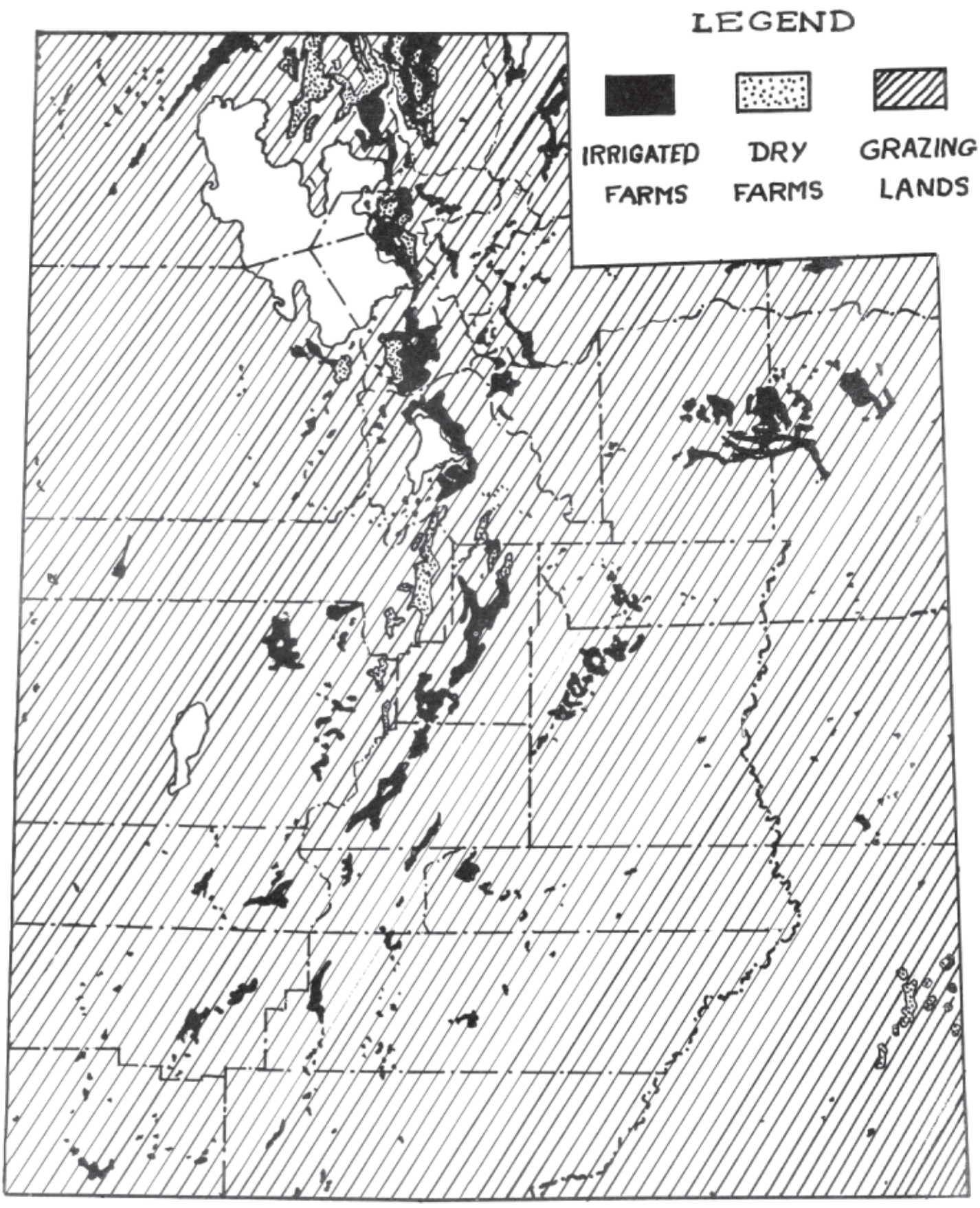


GREEN TREASUREON RANGELANDS

Utah is mainly a range land state. More land is suitable for grazing lands than for any other purpose. Look at the map. Do you see what a large part of Utah is range lands?

Some of the range lands are really forest lands. They are used for grazing during the summer months. At this time of the year the higher mountain places are used. During the spring and fall the foothill areas of the mountains are used for grazing. Some winter grazing lands are in the Great Basin Area.

Range lands must be taken care of if they are to provide enough food for cattle and sheep to graze. If there are too many animals grazing, they eat all the grasses and destroy the roots of the plants. Then there are no seeds left to drop on the ground and grow into new plants. When the grasses do not have a chance to ripen and reseed, the native grasses soon die out. Weeds gradually creep in to take their places. These weeds do not furnish the right kind of food for animals to eat.


LEGEND
IRRIGATED FARMS
DRY FARMS
GRAZING LANDS

GREEN TREASURE ON IRRIGATED FARMS

Small irrigated farms are scattered throughout Utah. These irrigated farms are located on the bottom lands of the valleys. There is good sandy or light loam soil in these places. There is enough water for the growth of GREEN TREASURE.

Perhaps, as you drove along Utah highways, you saw some of these irrigated farms. The most important ones are along the Wasatch front in the Provo, Salt Lake City, Davis County, Cache Valley, and Ogden areas. Find these places on the map on page 49.

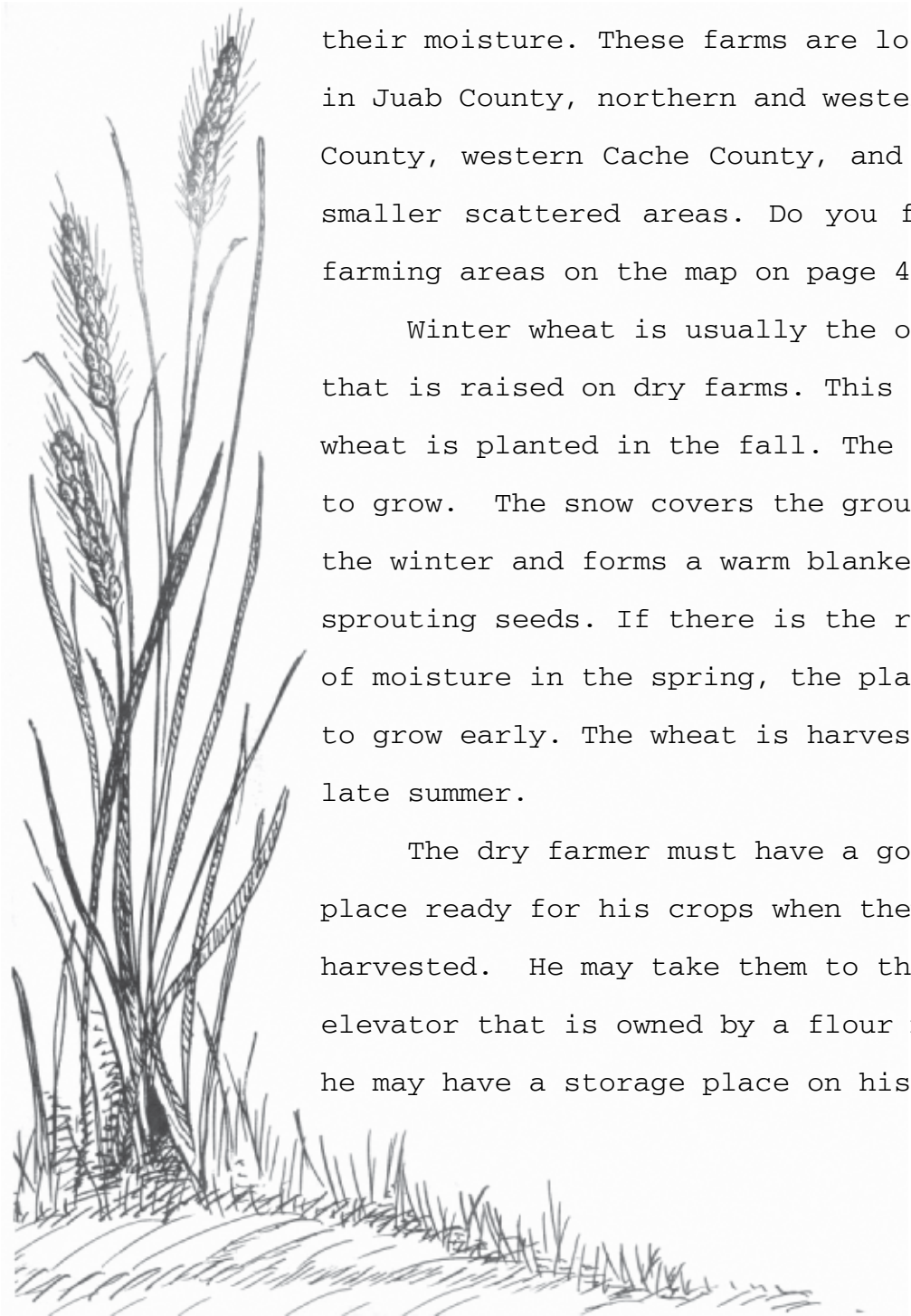
Dixie, in Washington County, is another important area where GREEN TREASURE grows. Dixie is located in the southwestern part of Utah. How very different this area is from other places in Utah. The climate is semi-tropical. This means that it is warm most of the year. Snow hardly ever falls there. The mountains keep cold winds from the valley. Even pecans and some figs grow in Dixie. The climate and soil are just right for these plants to grow well. There is enough

water to irrigate the farms and gardens.

Some irrigated farms are called truck farms. These farms produce vegetables and small fruits for people who live in cities and do not have their own gardens. Truck farmers take their products to nearby market places. Some may take them to packers or wholesale markets where they are distributed to places both in and out of the state.

Many canning plants are located near these irrigated areas. The farmers sell their products to the canneries. Bushels of GREEN TREASURE such as tomatoes, peas, green beans, corn, carrots, and some fruit are sold to canneries and to quick-freeze processing plants each year.

GREEN TREASURE ON DRY FARM LANDS



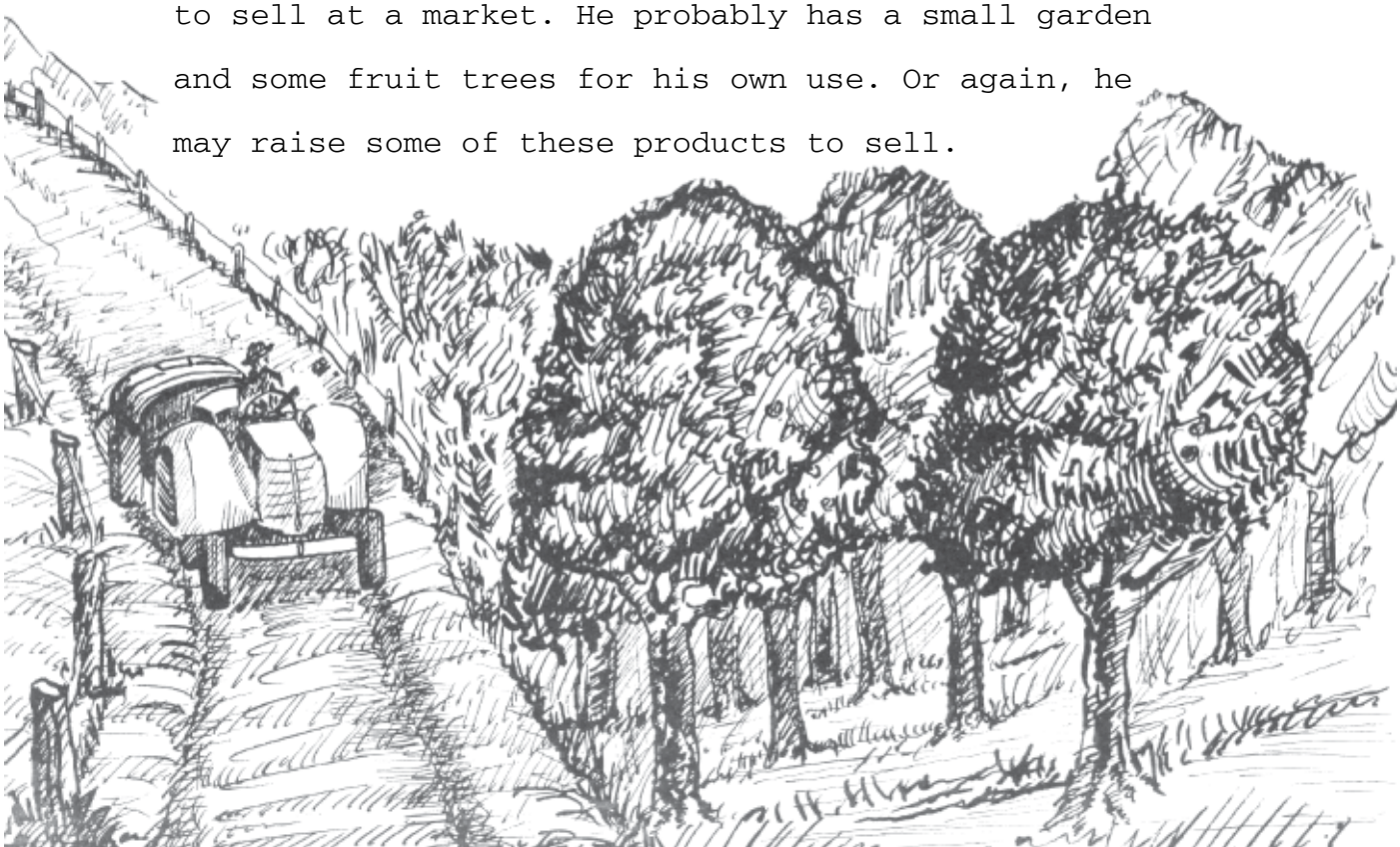
Some farms in Utah are not irrigated. We call this kind of farming, dry farming. The crops on these farms depend upon the rain for their moisture. These farms are located mainly in Juab County, northern and western Box Elder County, western Cache County, and a few other smaller scattered areas. Do you find the dry farming areas on the map on page 49?

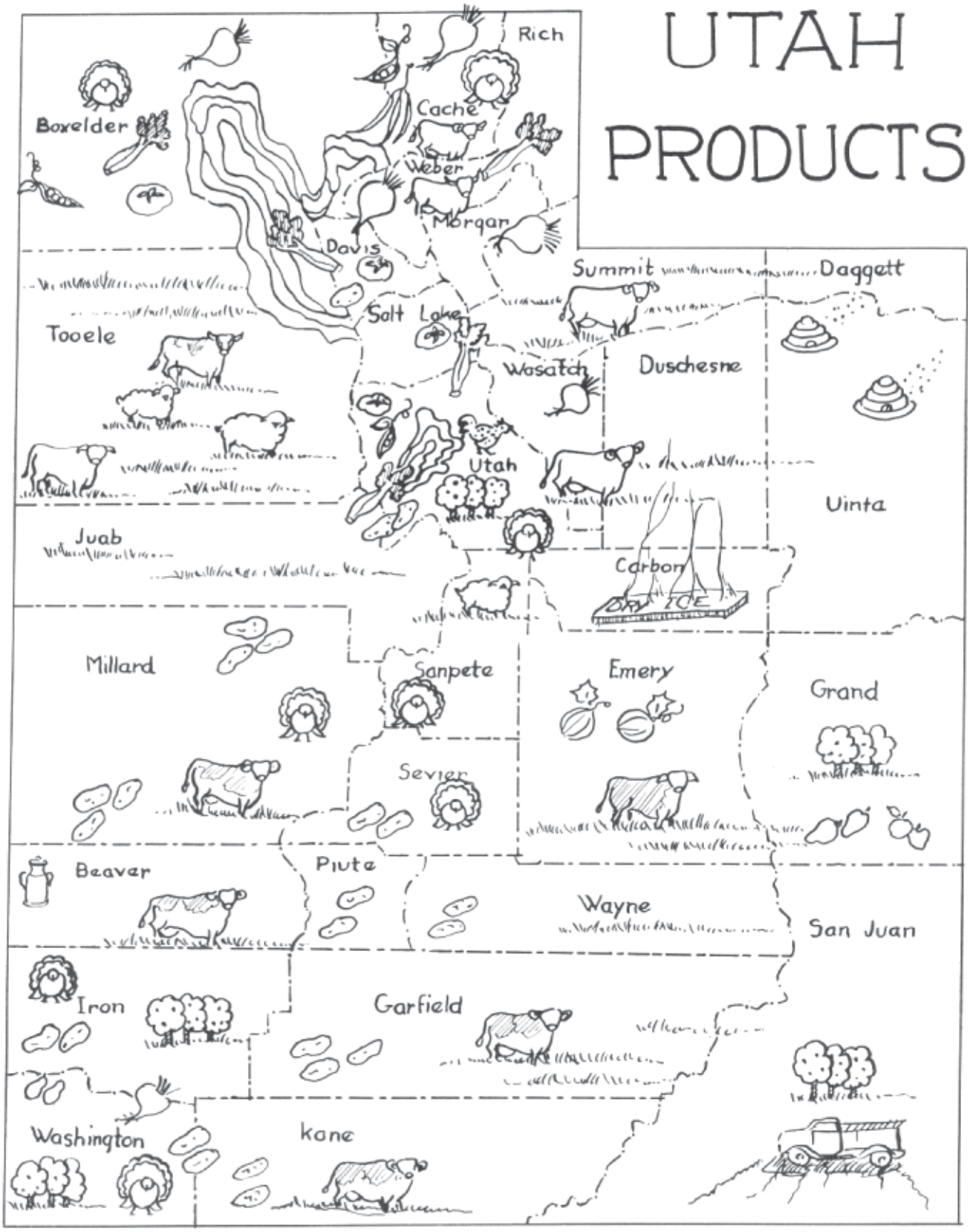
Winter wheat is usually the only crop that is raised on dry farms. This type of wheat is planted in the fall. The seeds start to grow. The snow covers the ground during the winter and forms a warm blanket over the sprouting seeds. If there is the right amount of moisture in the spring, the plants begin to grow early. The wheat is harvested in the late summer.

The dry farmer must have a good storage place ready for his crops when they are harvested. He may take them to the grain elevator that is owned by a flour mill. Or he may have a storage place on his farm.

The dry farmer works with powerful machinery to take care of his many acres. He harvests his crops when the weather is just right. If it rains too long or too much during the harvest season, the crops may be ruined.

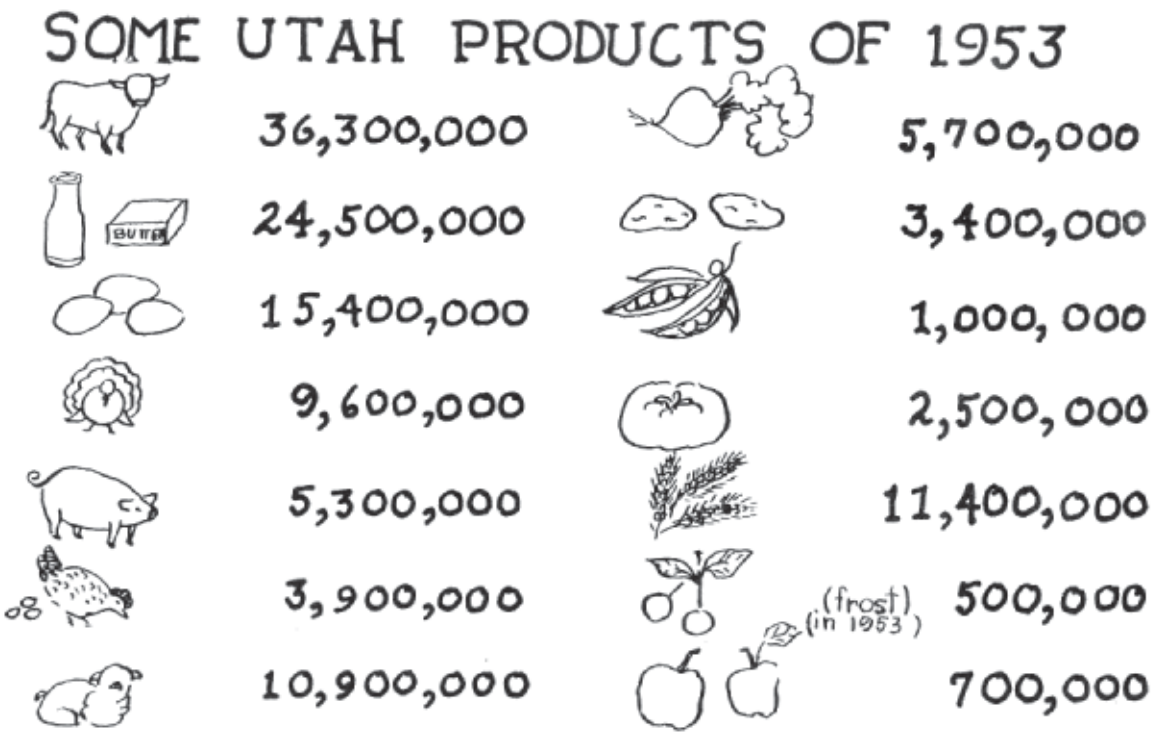
What would a typical farm where GREEN TREASURE is raised in Utah be like? A typical Utah farmer may own some range land, some irrigated land, or some dry farming land. This farmer lives in a small town. His farm lands may be just outside the town. He may have some pasture or grazing lands which are used for his work animals or dairy cattle. He may have some poultry or turkeys that he raised to use himself or to sell at a market. He probably has a small garden and some fruit trees for his own use. Or again, he may raise some of these products to sell.




UTAH
PRODUCTS
Rich
Boxelder
Cache
Weber
Morgan
Davis
Summit
Daggett
Salt Lake
Tooele
Wasatch
Duschesne
Utah
Uinta
Juab
Carbon
ICE
Millard
Sanpete
Emery
Grand
Sevier
Beaver
Piute
Wayne
San Juan
Iron
Garfield
Washington
kane

We raise many plants and animals which we use for food. Tomatoes, potatoes, peas, beets, beans, and celery are just a few of the GREEN TREASURES raised in Utah. Our fruit orchards supply us with peaches, cherries, apples, pears, apricots, and plums. Small berries such as strawberries are also very plentiful. The meat from animals raised in Utah supplies most of the meat we eat. We raise more poultry in Utah than we need.

The chart below will tell you how much money we received in one year from some of the most important GREEN TREASURE. The figures mean millions of dollars.

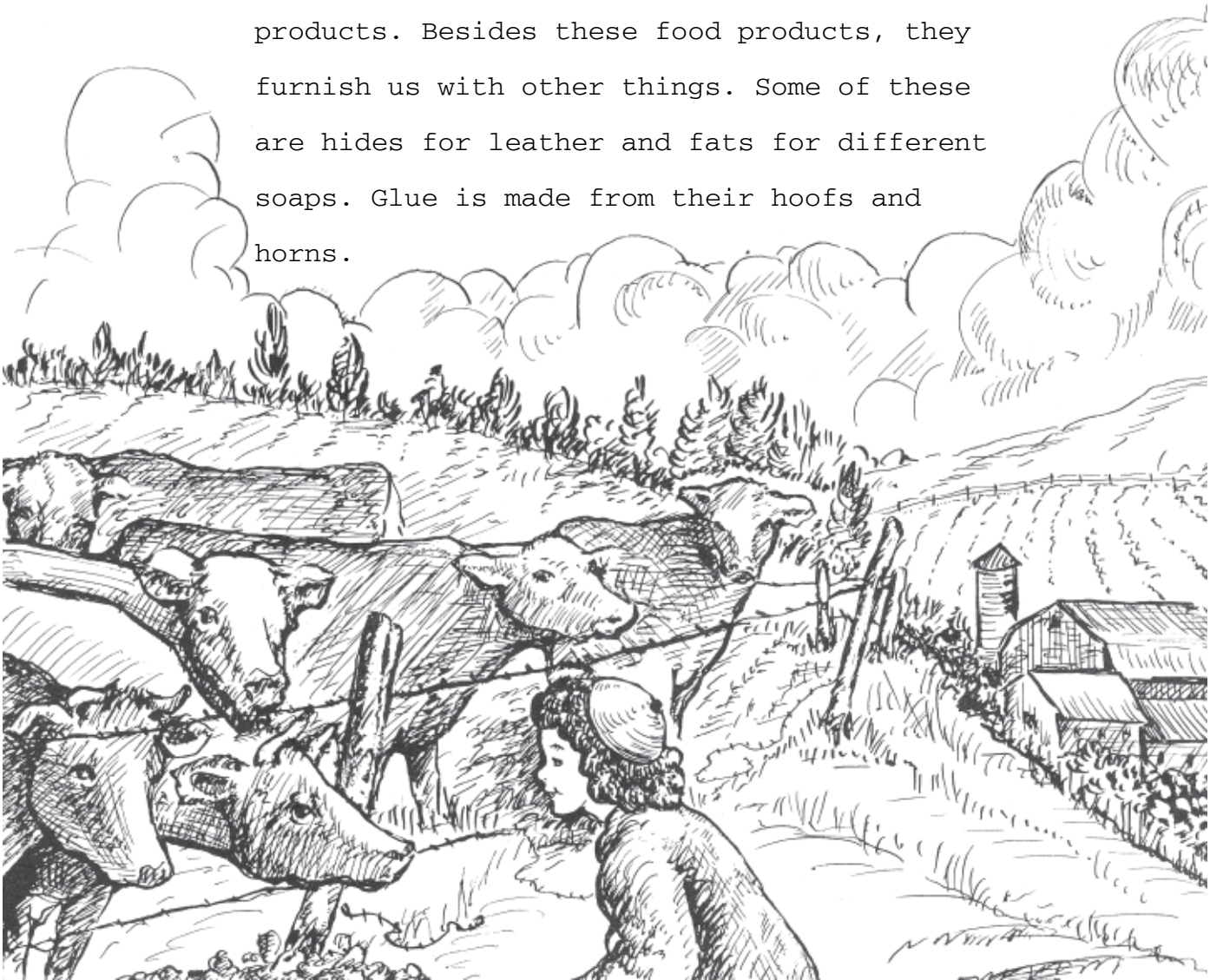


MEAT – A GREEN TREASURE

You know that most of our state is made up of grazing lands. We are a leading livestock state because of our many, many acres of grazing lands.

CATTLE

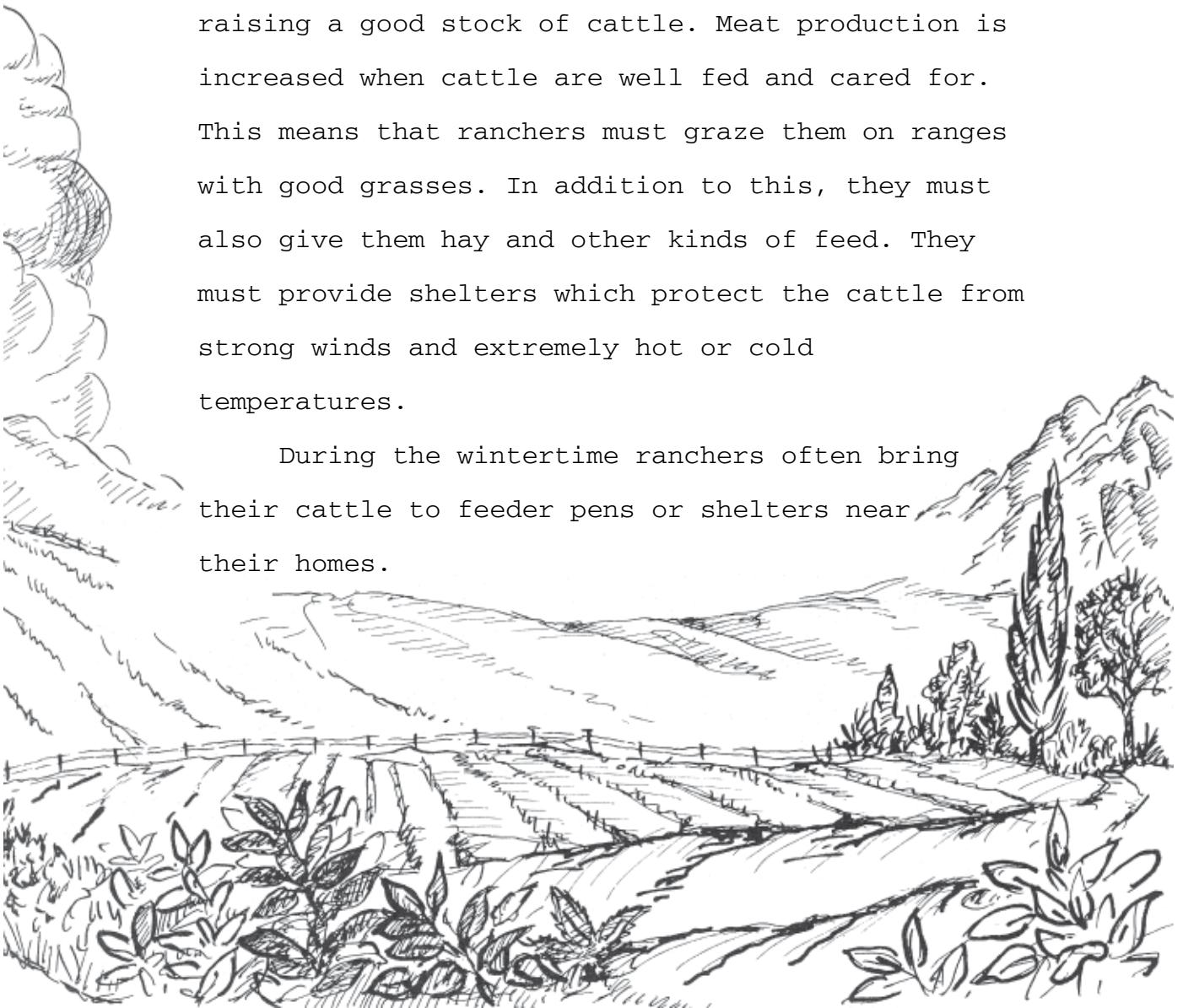
Cattle are another very important GREEN TREASURE because some of them furnish us with meat. Some cattle supply us with milk and milk products. Besides these food products, they furnish us with other things. Some of these are hides for leather and fats for different soaps. Glue is made from their hoofs and horns.



Many people in Utah make their living from the cattle they raise. Some farmers raise cattle for milk. They buy dairy cows that produce milk. Other farmers raise beef cattle for meat. Most ranchers try to raise the best kind of cattle possible for the use they want to make of them. Then they can sell their products and make a good profit.

Proper feeding and good care are important in raising a good stock of cattle. Meat production is increased when cattle are well fed and cared for. This means that ranchers must graze them on ranges with good grasses. In addition to this, they must also give them hay and other kinds of feed. They must provide shelters which protect the cattle from strong winds and extremely hot or cold temperatures.

During the wintertime ranchers often bring their cattle to feeder pens or shelters near their homes.



The cattle are then fed hay and grains that have been grown on croplands. Many ranchers raise crops on their own farms. They use these crops to feed the animals when they cannot graze on range lands.

Before cattle are sent to market, they must be fattened. Many are sent to feeder lots in the Middle Western states such as Missouri or Kansas. Some states grow much corn. This corn is fed to animals to fatten them for market. Then the cattle are sent to packing places where they are killed.

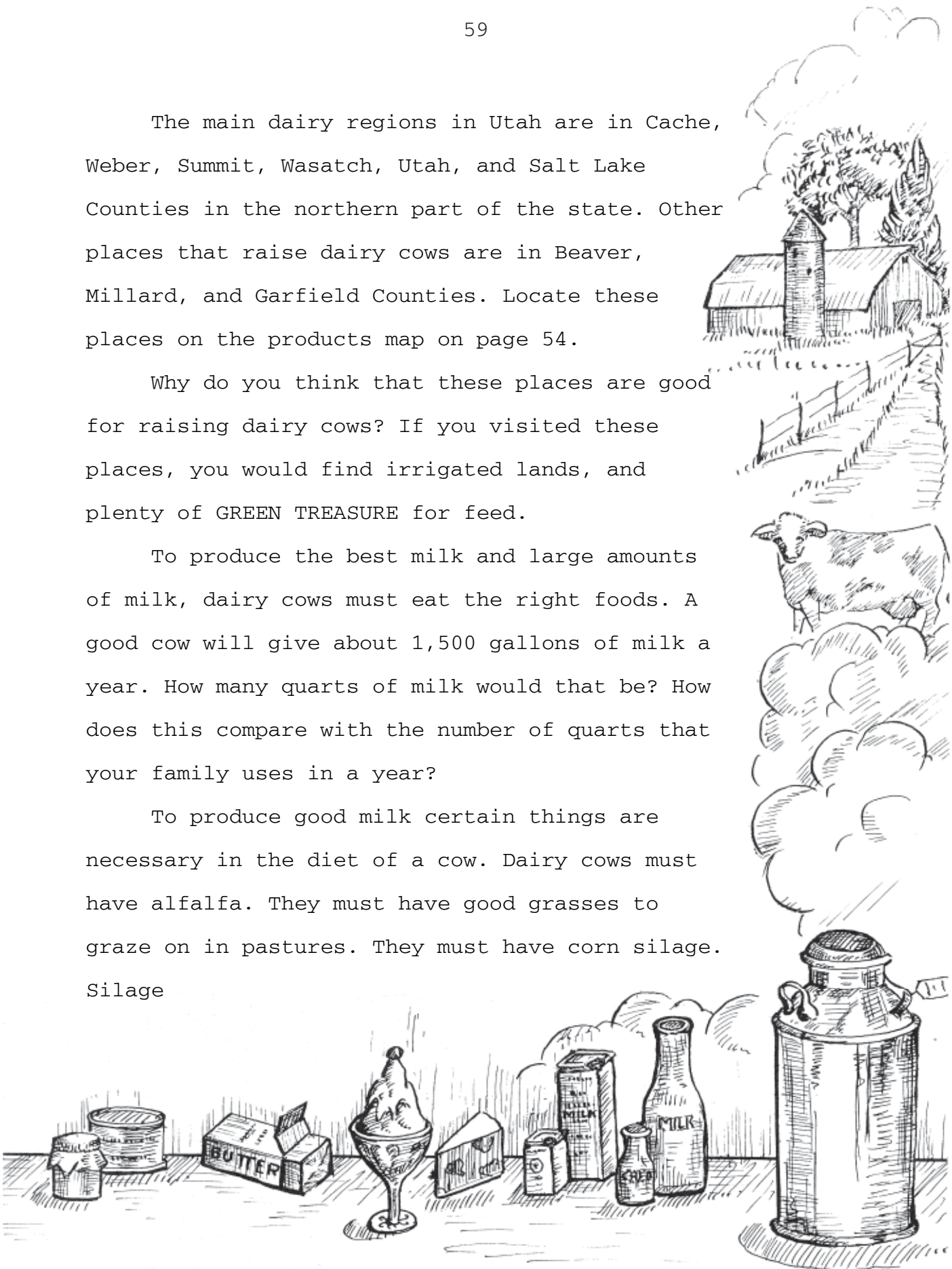
The cattle in the picture are beef animals. They are grazing on GREEN TREASURE. Now you know why we can think of cattle as GREEN TREASURE, too.

The main dairy regions in Utah are in Cache, Weber, Summit, Wasatch, Utah, and Salt Lake Counties in the northern part of the state. Other places that raise dairy cows are in Beaver, Millard, and Garfield Counties. Locate these places on the products map on page 54.

Why do you think that these places are good for raising dairy cows? If you visited these places, you would find irrigated lands, and plenty of GREEN TREASURE for feed.

To produce the best milk and large amounts of milk, dairy cows must eat the right foods. A good cow will give about 1,500 gallons of milk a year. How many quarts of milk would that be? How does this compare with the number of quarts that your family uses in a year?

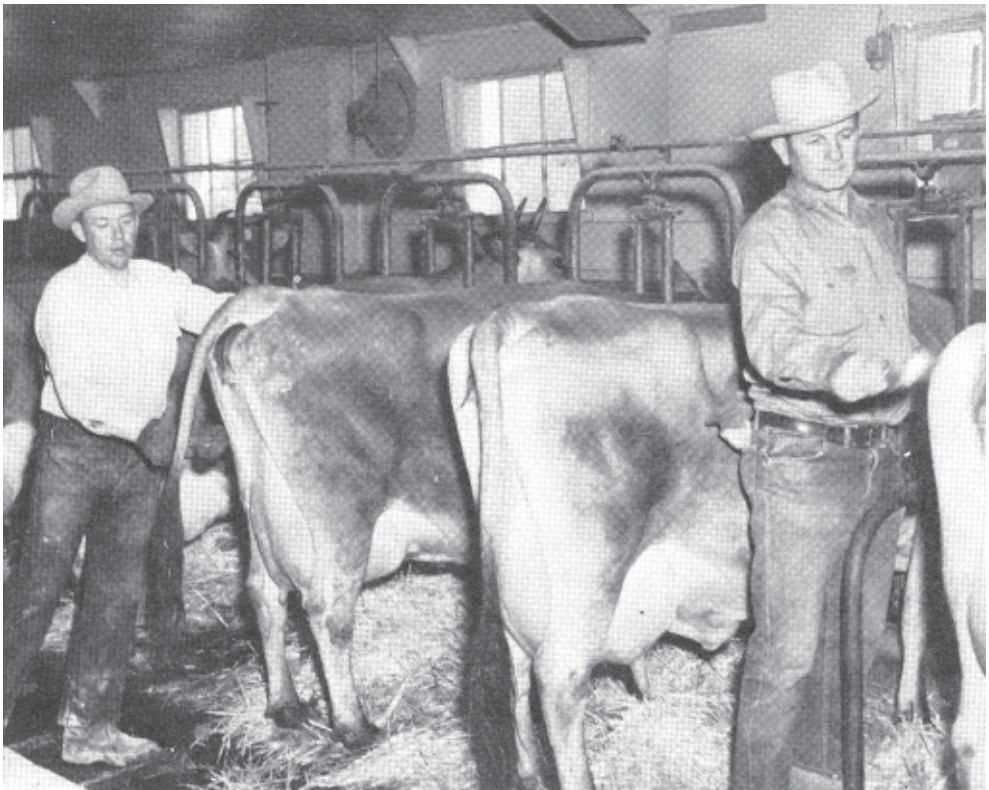
To produce good milk certain things are necessary in the diet of a cow. Dairy cows must have alfalfa. They must have good grasses to graze on in pastures. They must have corn silage. Silage



is corn that has been chopped and stored. Then certain bacteria are added to preserve it, as cabbage is preserved by making sauerkraut. Cows must also have grain such as barley or oats, and bran for roughage. They are sometimes given cottonseed or soybean meal.

Most of the dairy farms in Utah have good, clean barns. The floors are hard-surfaced and kept clean. Many places have open sheds in the yards to shelter the cows from the hot sun.

To furnish us with safe and clean milk, cows are tested. If a cow is found to have any disease, the cow is treated for it immediately. No milk is sold then from these cows.

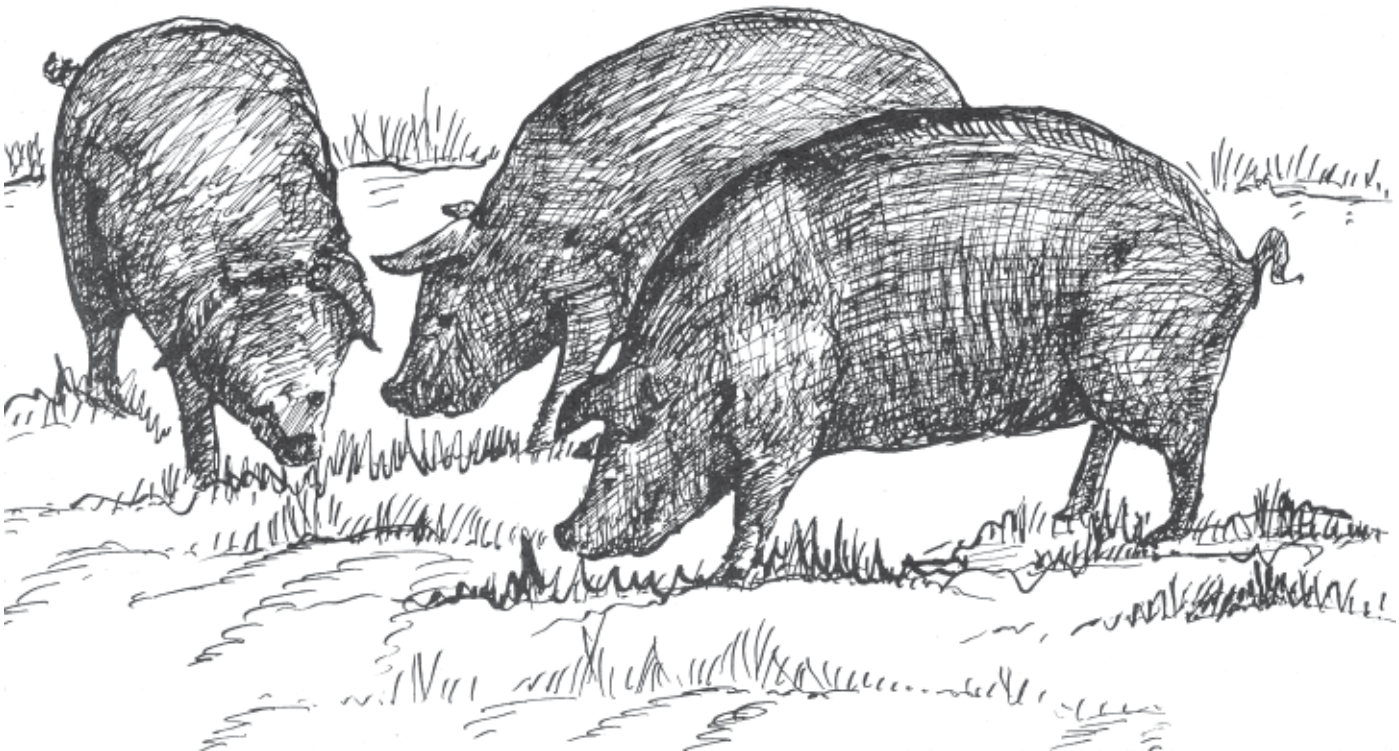


HOGS

Some farmers raise hogs on their farms. This is another GREEN TREASURE in the form of meat. Hogs live on kitchen scraps, cereals, skimmed milk, and waste dairy products. In some places they are fed corn and chopped grain to fatten them for market.

Hogs are good meat producers. Look on a package of bacon or ham. Was it packaged in a packing plant near you? The pork chops or sausage that you eat come from hogs.

Every part of the hog is used for meat or as a by-product. See if you can find out what the by-products are.



SHEEP

If you happen to be driving along Utah highways late in September or early in October, you will be sure to see herds of sheep coming down from the grazing lands in the high mountain forest lands. You will have to stop and wait for the bleating lambs to cross the highway. Nothing seems to hurry them on their way. This animal migration usually lasts for several weeks.

Some of these sheep will be taken along trails to winter grazing lands in the western part of our state. Some of them are shipped by train or truck to winter grazing areas. Most of the sheep in Utah graze on the winter desert ranges from November until May. There they eat GREEN TREASURE.

The snow supplies water for the animals to drink. The snow is usually not deep enough to cover the grasses on which they feed.

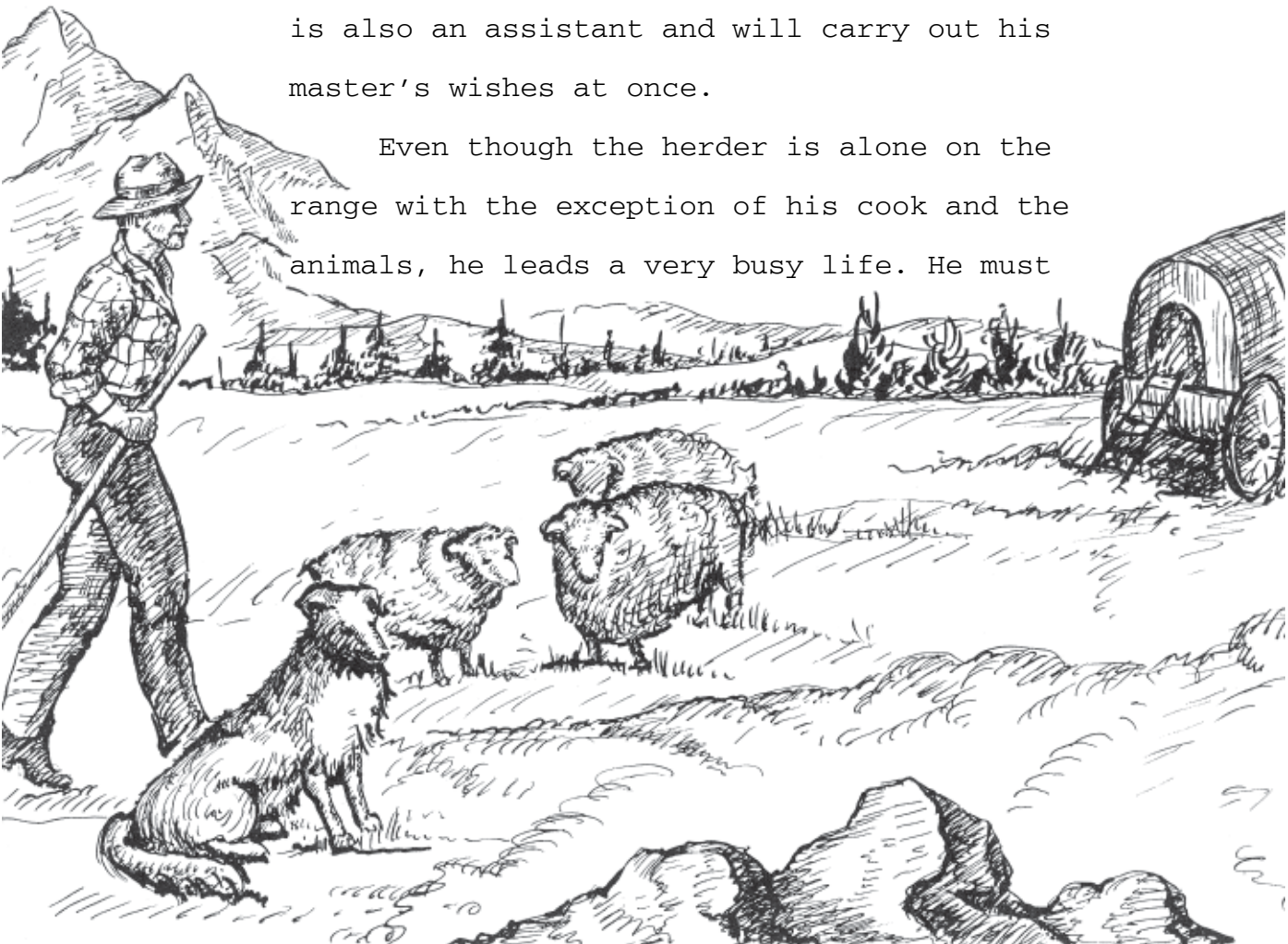
Sometimes when there is bad weather on the ranges, the sheepmen have to provide more feed for the sheep. They often take bales of hay and grain out to the ranges to feed the animals. Sometimes in bad weather trucks or horses cannot take hay and grain to the ranges. During these times, airplanes are sometimes used. They drop bales of hay to the ground where the sheep can eat it.

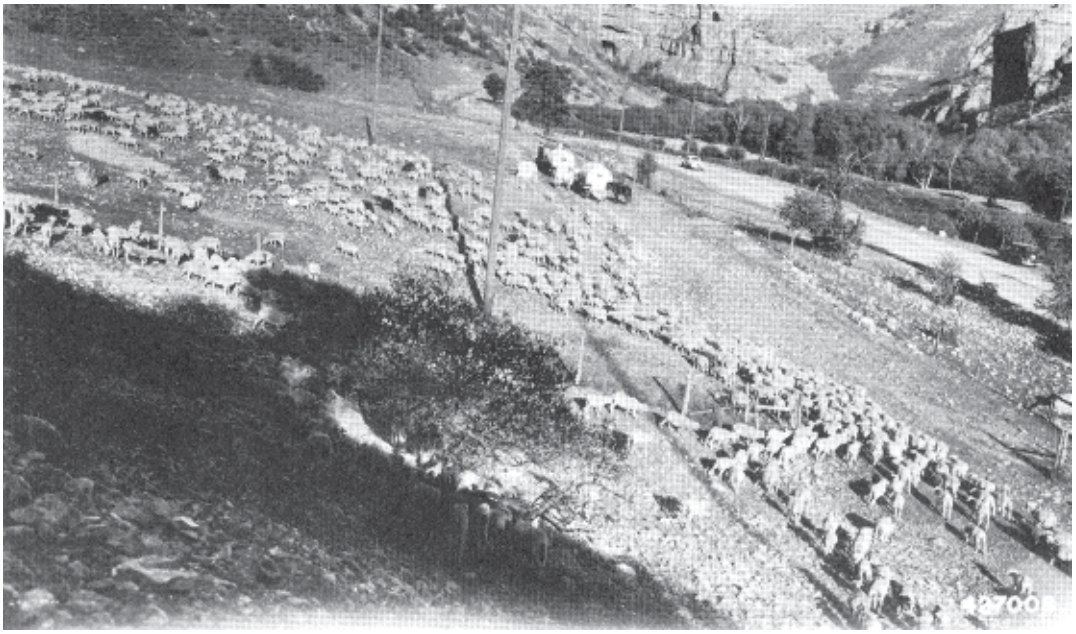
Sheep are raised to supply us with meat. When we eat mutton, we are eating meat from a sheep that is over a year old. When we eat lamb, it comes from a younger sheep.

There could not be so many sheep raised in Utah if it were not for the work of the herder and his faithful dog. A herder cannot get along very well without the help of a well-trained dog. The dog will do more than many men in herding sheep and making them go where the herder wants them to go.

One of the most popular breeds used as a sheep dog is the Border Collie. This dog, when well trained, is a companion for the sheepherder when he is on the range for months at a time. He is also an assistant and will carry out his master's wishes at once.

Even though the herder is alone on the range with the exception of his cook and the animals, he leads a very busy life. He must





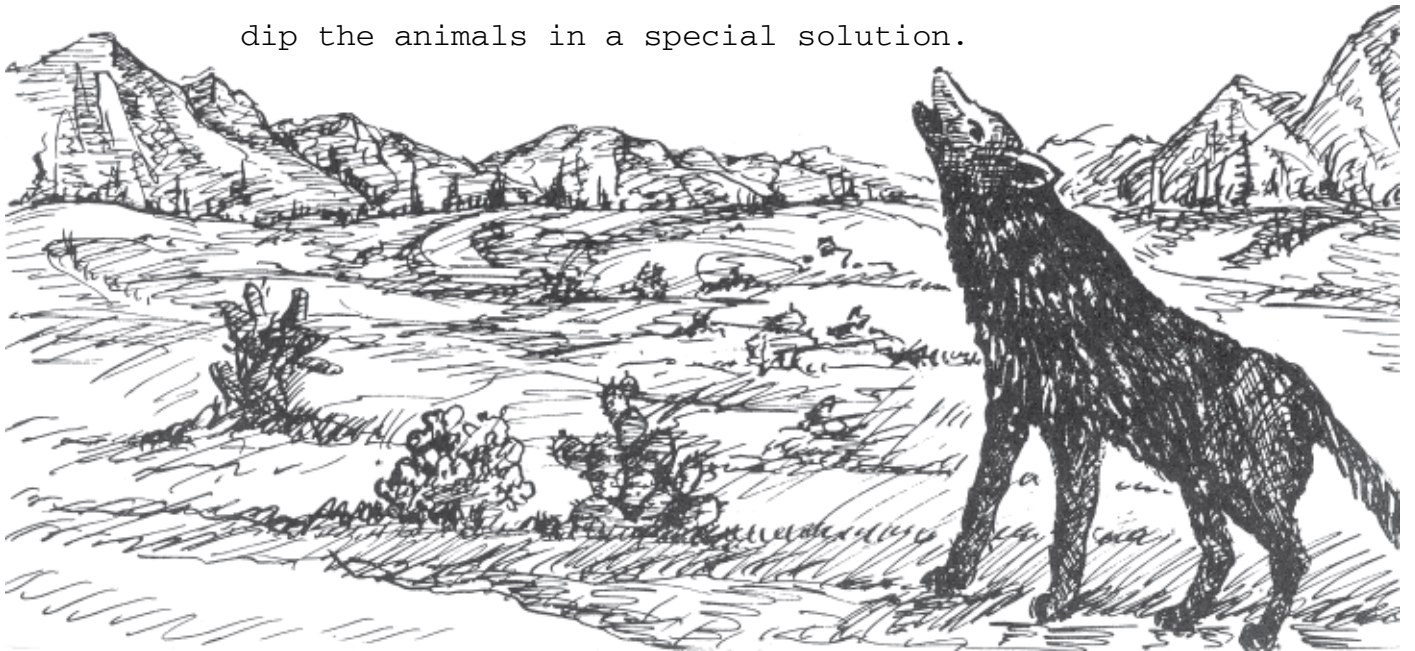
protect his sheep from their enemies and keep them from straying away from the rest of the flock.

Sheep are naturally very clean animals. They will keep away from filth if they have a chance. To raise the best sheep, the herder must provide a clean and healthy place for them to live.

The sheep in the picture above are on the trail through Spanish Fork Canyon to the lambing range. Notice the sheepherder's wagon. Horses are still used in places where there are rough, rocky roads on which they must travel.

The coyote and the mountain lion are enemies of sheep in Utah. Poisonous weeds are also an enemy. The herder must be familiar with harmful weeds and keep his sheep from grazing in places where weeds are growing.

The wool of the sheep provides a good place for certain small animals called ticks to live. The sheep tick is a pest that lives on the sheep. This insect crawls through the wool and over the skin of the sheep and feeds on its blood. Sometimes this causes an infection. This makes the sheep rub or bite its wool, thus spoiling the wool for marketing. Infected sheep eat very little food. They lose weight and will not sell for very much on the market. In order to get rid of these pests the sheepherder must dip the animals in a special solution.



POULTRY – A GREEN TREASURE

EGGS

Not so very long ago, we did not raise enough chickens or produce enough eggs to feed all the people in Utah. We had to depend upon other places for these products.

Today, it is quite different. The eggs that you ate for breakfast, no doubt, came from the hens that are raised in Utah. Recently our hens laid so many eggs that everyone living in our state could have 720 eggs in one year. You can see that we can easily supply other states with eggs. We couldn’t possibly eat that many.

We ship eggs and poultry to places as far east as New York and as far west as the Hawaiian Islands. Other market places for our eggs and other poultry products are in large cities. We send them to large cities such as Los Angeles, San Francisco, Denver, Phoenix, Portland, and Seattle.

Have you ever visited in one of these cities? How far did you travel from your home?

Now you know how far some of these products travel before they reach a market place.

Our farmers must do two important things if they produce fine eggs for markets. First, the hens must be fed properly so that they will lay the best eggs. Then the eggs must be taken away from the hens as soon as possible and stored in a cool, moist place. The quality of the eggs becomes poor if they are allowed to remain warm very long.

Before the eggs are sent to markets or to food stores, they are candled. This means that they are held over a strong light so that the inside of the egg can be seen. Eggs that have specks on the inside are separated from the rest. The eggs are also graded according to their size.

Eggs are packed into cartons with divided sections. These make it possible for them to travel long distances with very little breakage.

CHICKENS

Not only are chickens raised for the eggs they lay, but some are raised chiefly for their meat. Scientists have helped the farmer to produce better chickens for market. There have been ways developed to raise them with more meat in a shorter length of time. The farmer can now raise a chicken that will weigh about four pounds when only ten weeks old. This is done by better care and careful feedings. The chickens are fed a certain mixture of grains. They are provided with clean, warm coops for shelter.

The chickens must be kept free from disease. The poultryman must watch them carefully so that any disease will be checked promptly. Sometimes chickens are vaccinated against certain diseases. It is also necessary at times to spray the coops

or the chickens for mites. These are tiny animals that are pests to chickens.

At one time the farmer had two problems when he raised chickens. First, he didn't know what to do with his hens after they had stopped laying. Second, he didn't have a market for the many young roosters that were hatched each year.

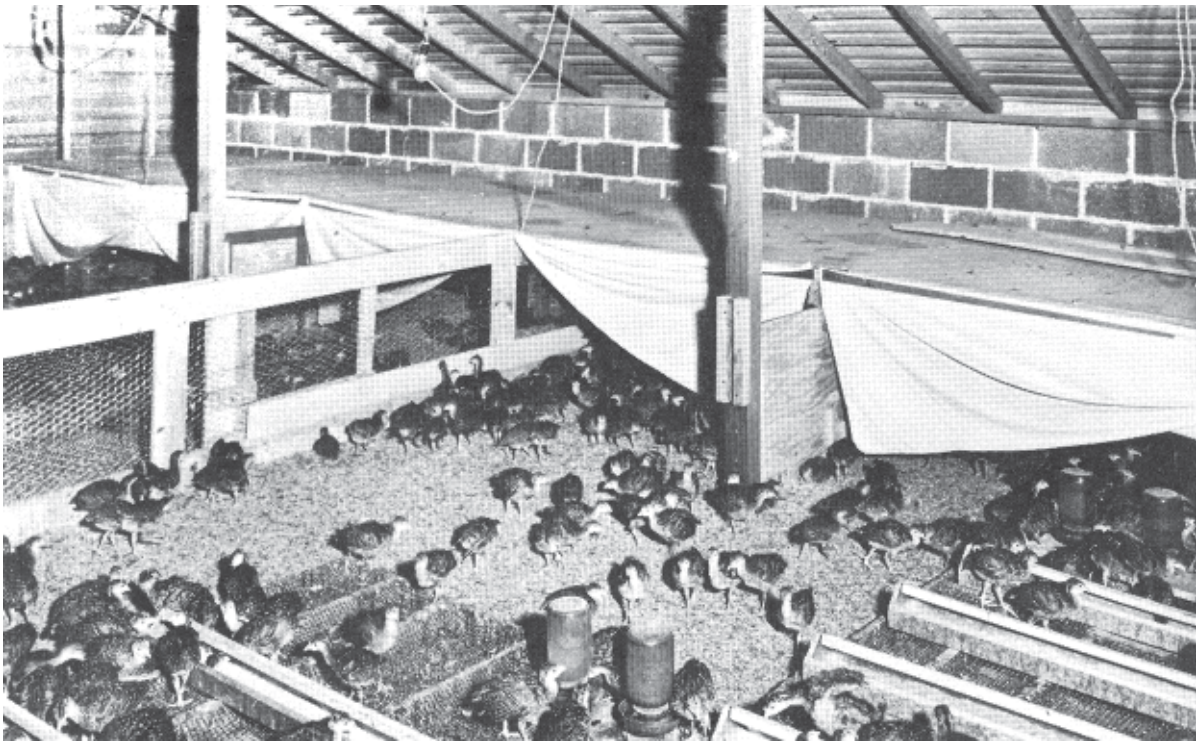
So, some poultrymen got together and tried to find answers to these questions. How could they send their chickens to market without losing weight? How could they keep them in healthy condition while they were being shipped to market? They found the answers to their questions by building processing plants. Now the chickens are taken to the processing plant. There they are killed and packaged for market. Packaged chickens are sent long distances to many parts of the country.

Now there are many processing plants where the chickens are killed and packaged. Some of these plants are at Tremonton, American Fork, Ephraim, Cedar City, and Salt Lake City.

TURKEYS

Have you eaten turkey for your dinner recently? Did you eat it for a holiday or a special occasion? Or did your mother just happen to buy one because the butcher had a good supply of them to sell?

Turkeys were once considered a holiday treat. They were eaten only on Thanksgiving, Christmas, or other special occasions. Now we enjoy them at any time of the year. More and more farmers are raising bigger flocks. This means that we can eat them whenever we wish.



Utah is a good place to raise turkeys. These birds grow well in our high altitudes, our cool nights, and long autumn days. Such conditions have made it possible for Utah to become one of the leading turkey raising states in the country. Sanpete, Sevier, Cache, and Box Elder Counties lead in turkey production. Do you live in any one of these areas? If you do, perhaps you can visit a farm that raises turkeys. Ask the farmer if he gives his flock of birds any special care.

Young turkeys are hatched and kept in brooders to keep them warm. They are provided

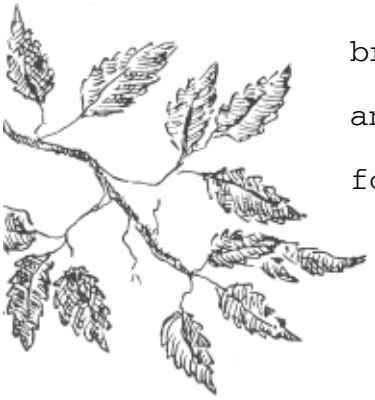
with food to eat and water to drink. They are kept in brooders for between five to ten weeks. Young turkeys must have special care. They are hard to raise until they reach a certain age. When they are several weeks old, they are permitted to go into runs near the brooders. Runs are fenced-in places where they have more freedom to run about than they do in the brooders.

When they are older, they are moved to range to graze. The ranges are fields or pastures that are not used as farm lands. Farmers feed their turkeys a special mixture of grain, which helps them to grow strong and healthy. Farmers sometimes plant sunflowers and small sweet corn for turkeys to eat, in addition to their other food.

Shelters and roosts are usually provided on the ranges to protect the turkeys from sudden changes in the weather. The ranges should be kept as clean as possible. There should be clean, fresh water at all times.

Turkeys should be protected against diseases. A whole flock of birds can be lost if diseases are allowed to spread.

Turkeys furnish us with meat the year around. Our chickens also provide us with eggs and meat. We produce more of these products than we can eat. So, many of them are sent to markets in other places. This brings money into our state for the farmers and other workers. Then they can buy other food products that are not raised here.



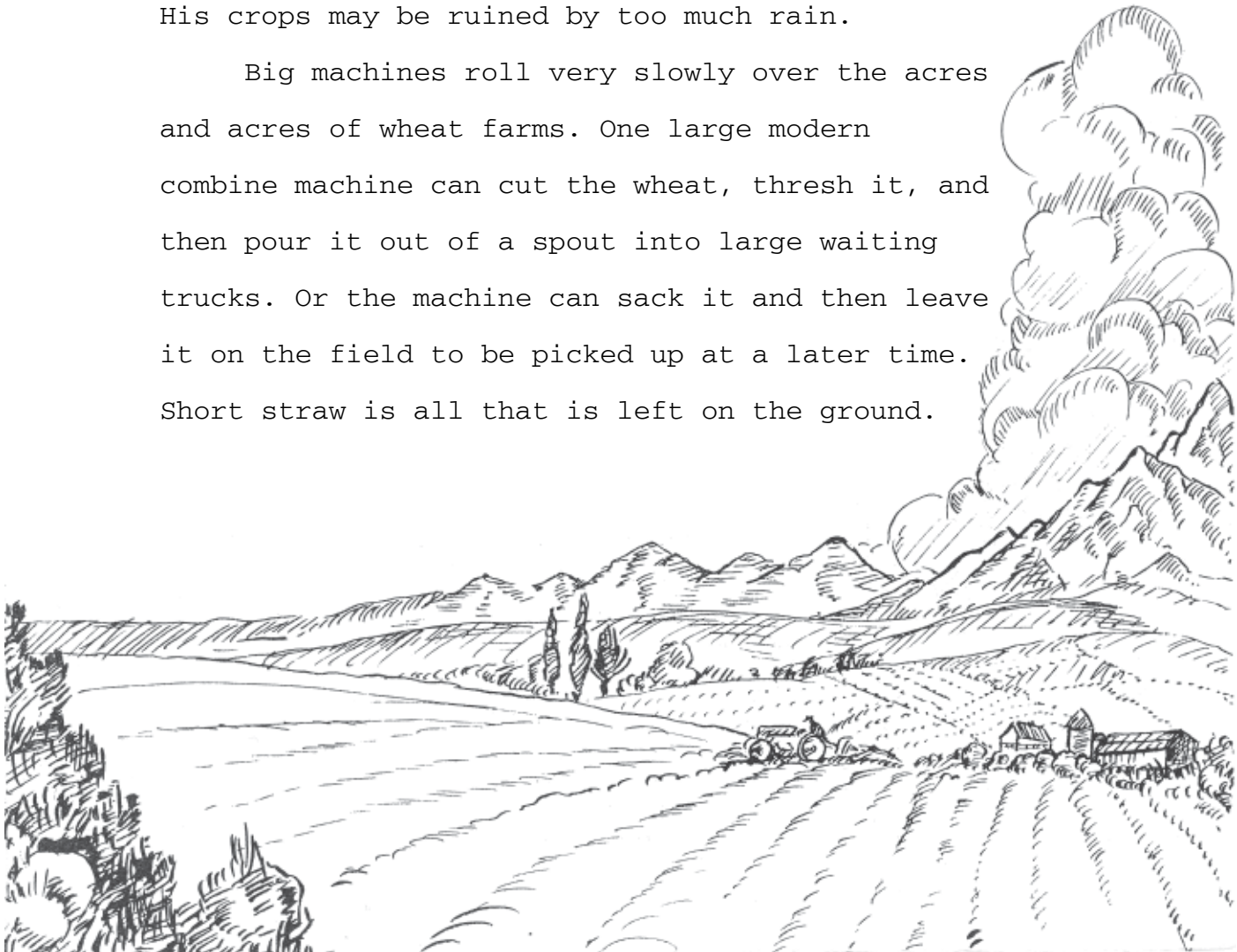
CROPS – A GREEN TREASURE

WHEAT

In the late summer, wheat fields all over Utah are ripe and golden yellow. In the spring these fields were covered with tiny green shoots. Wheat is one of Utah's GREEN TREASURES.

When the farmer sees that the heads of the wheat are fully ripe with grain, he knows that it is time to harvest. Now he looks anxiously at the weather. He gets daily reports about the weather. His crops may be ruined by too much rain.

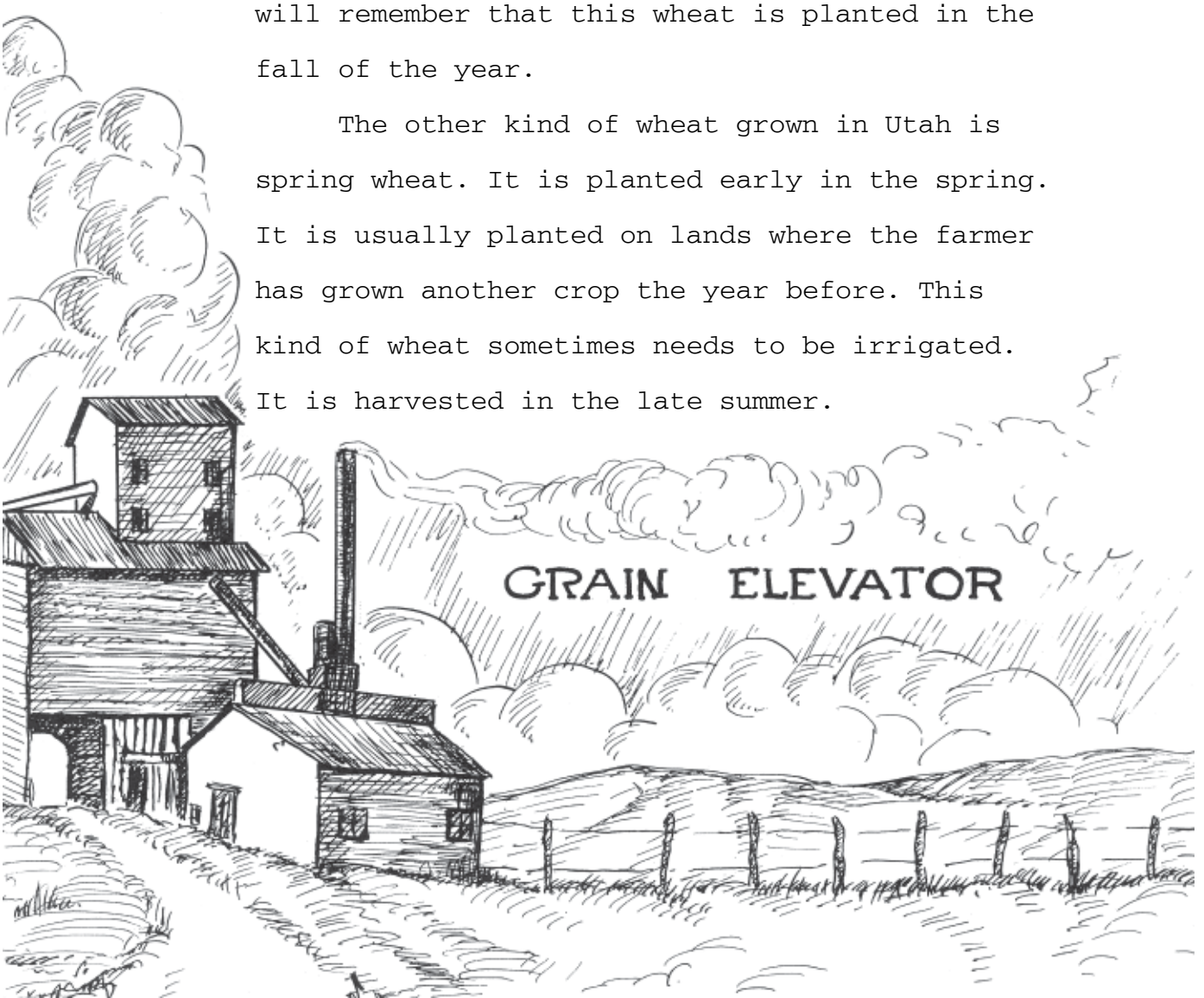
Big machines roll very slowly over the acres and acres of wheat farms. One large modern combine machine can cut the wheat, thresh it, and then pour it out of a spout into large waiting trucks. Or the machine can sack it and then leave it on the field to be picked up at a later time. Short straw is all that is left on the ground.



The harvested wheat may be sent to a grain elevator to be sold or stored until it is needed. Sometimes it is taken directly to a mill to be ground into flour. Some of the flour is used in our home or in bakeries. Some is shipped out of the state. The main market out of our state is California.

Two types of wheat are grown in Utah. Winter wheat is raised on the dry farms. You will remember that this wheat is planted in the fall of the year.

The other kind of wheat grown in Utah is spring wheat. It is planted early in the spring. It is usually planted on lands where the farmer has grown another crop the year before. This kind of wheat sometimes needs to be irrigated. It is harvested in the late summer.



SUGAR BEETS

Another GREEN TREASURE raised by the Utah farmer is sugar beets. Sugar Beets are grown mostly in Weber, Box Elder, Cache, Wasatch, Morgan, Sevier, Sanpete, and Utah Counties. Find these places on the map on page 54.

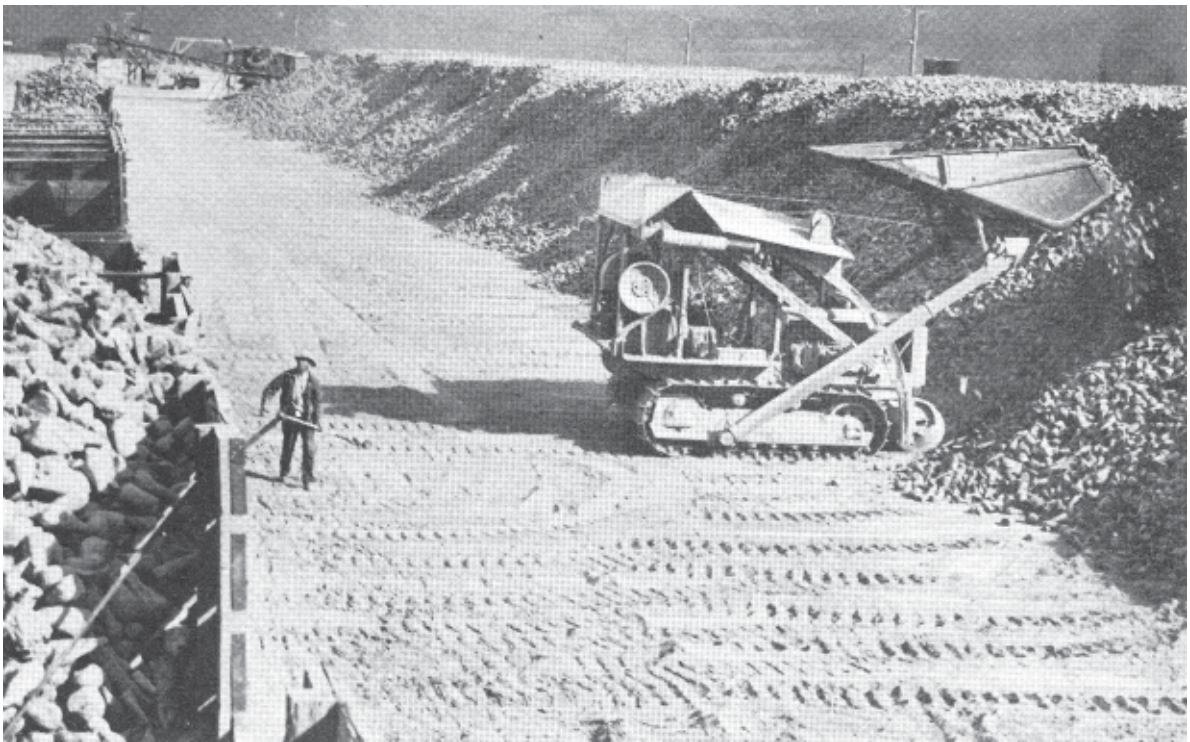
Sugar beets grow well in Utah on irrigated farm lands. Before the farmer plants his seeds, he must see that the soil is in good tilth. Good tilth means that the soil is crumbly and contains moisture. It must also contain elements that plants need to grow.

Modern machines do most of the work on a sugar beet farm. Machines are used to plant

the seeds one at a time. When it is time to thin the young plants and get rid of weeds, machines again do the job. This was once done by hand. It was a very slow and hard job.

In the autumn the beets are ready to be harvested. Another machine, a harvester, pulls the beets from the ground. Then it tops them and leads the beets into trucks.

The picture you see below shows a beet dump. The beets are taken from the field to one of these storage piles. These are usually near a railroad terminal. From here the beets are loaded into freight cars and taken to the sugar refinery.

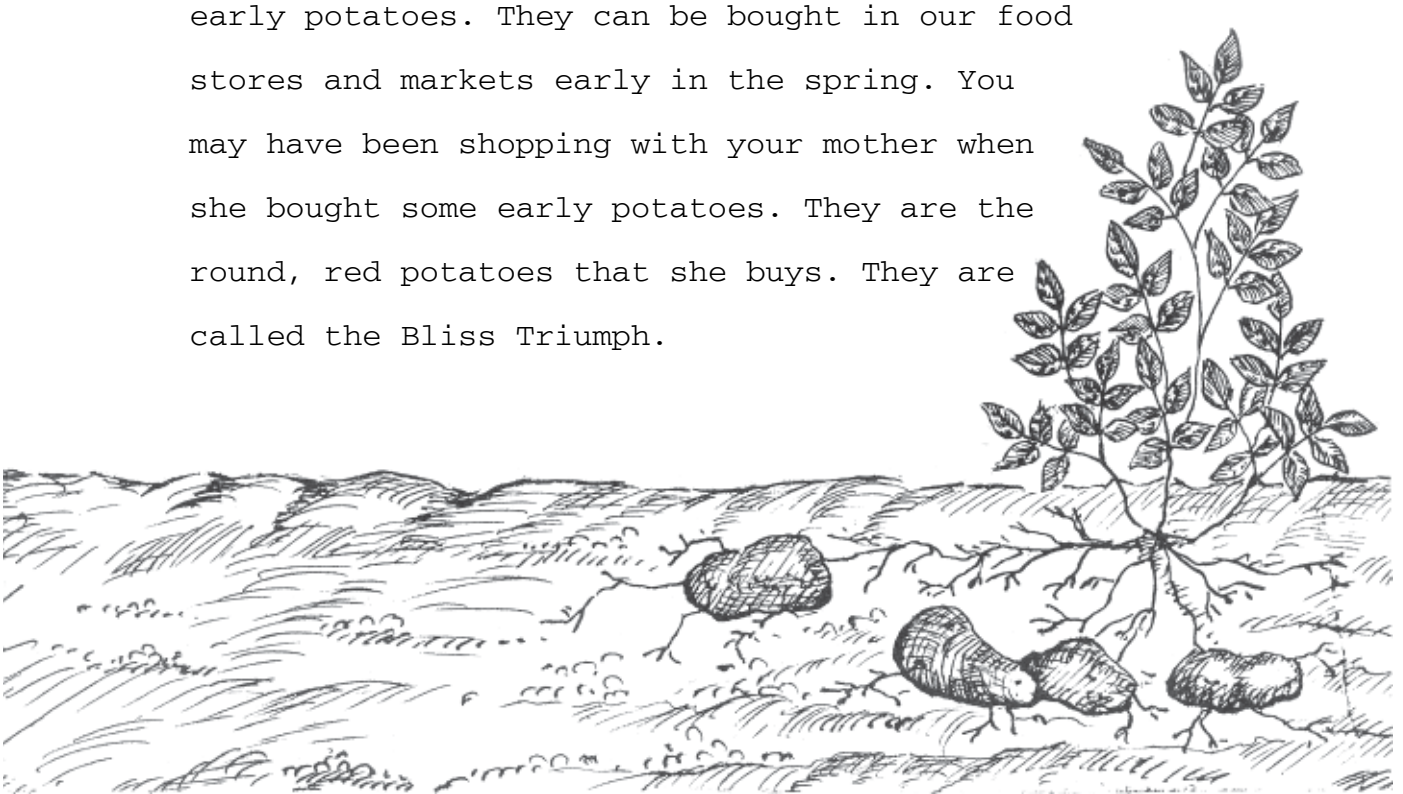


VEGETABLES – A GREEN TREASURE

POTATOES

Potatoes have become important GREEN TREASURE in several of the counties in Utah. One of the most popular kind is the russet potato. These potatoes come from Washington, Sevier, Piute, Garfield, Iron, and Millard Counties. Do you know anyone who lives in these places? Perhaps you could write to him. Ask him to tell you how the potatoes are raised. Find out where they are sent to market.

Another variety of potatoes is raised in the north central part of the state. These are early potatoes. They can be bought in our food stores and markets early in the spring. You may have been shopping with your mother when she bought some early potatoes. They are the round, red potatoes that she buys. They are called the Bliss Triumph.



Just as in raising other GREEN TREASURE, modern machinery helps the farmer to raise potatoes. There is still plenty of work in getting the potatoes from the farms to the markets. In some places schools close for a harvest season. Then boys and girls help with the work. In other places, workers like those you see in the picture below are used to help with the work.

After the potatoes are harvested, they are usually taken to potato sheds. There they are sorted according to size. In some places the potatoes are washed and dried. Then they are sacked. Some are taken to a potato cellar where they are stored until they are needed. Others are sent right from the fields to the markets.

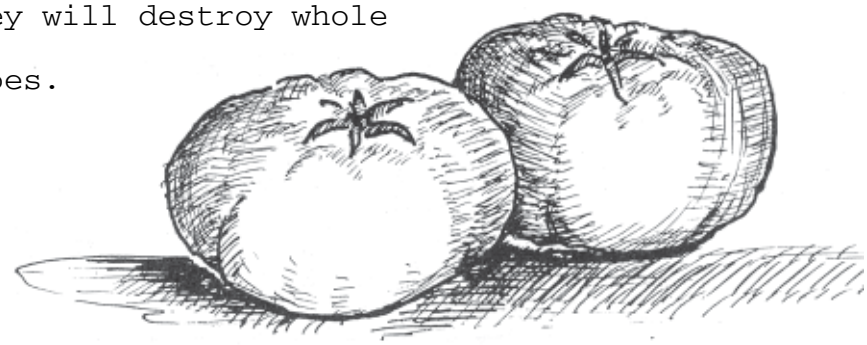
TOMATOES

Tomatoes for canning and for market use are important in Utah. These GREEN TREASURES are grown in Utah, Salt Lake, Davis, Weber, Cache, and Box Elder Counties. Early tomatoes for market are grown in Washington County.

Tomatoes grow well in these places because there are the right kind of soil and enough water for the plants to grow. Tomatoes grow best on level ground in loam soils. They require lots of water.

Tomatoes start to grow from tiny seeds in hotbeds or nurseries. They are transplanted to open fields when the young plants are about six inches tall. They are planted in rows about thirty inches apart.

Tomato plants must have very good care. They must be protected from frost. Early frost will kill the young plants. They must also be protected from harmful insects such as the cutworm and earwig. If these are not controlled, they will destroy whole crops of tomatoes.



PEAS

Some Utah farmers raise peas. Peas, another GREEN TREASURE, are planted on level ground. They grow well in heavy loam soil. A good supply of water is necessary because the plants wilt quickly.

Some farmers raise peas because they require less time to grow than other crops. Farmers also use the same machines to plant and harvest peas that they use in harvesting grain. Peas are a good crop for the farmer to rotate with his other crops. They are good soil builders.

Peas do not need as much care as some other GREEN TREASURES. The vines spread over the ground. It is not necessary to cultivate them. Weeds do not keep the sturdy vines from growing.

The farmer cuts his crop with a mowing machine. He does this by attaching a special part called a curler to the cutter bar. Look closely at the second picture to see this part. The curlers lift the vines up and turn them over. When the farmer cuts the next row, he does not run over the pods and mash the peas.

The pea vines are loaded upon trucks with a loader, as you see in the third picture. Then the farmer must take them as soon as possible to a place called the viner. If the peas are left in the sunlight, they have a bitter flavor. The pea vines are taken to the viner, where the pods are shelled by machine. The vines are piled into a stack to be used as fertilizer.

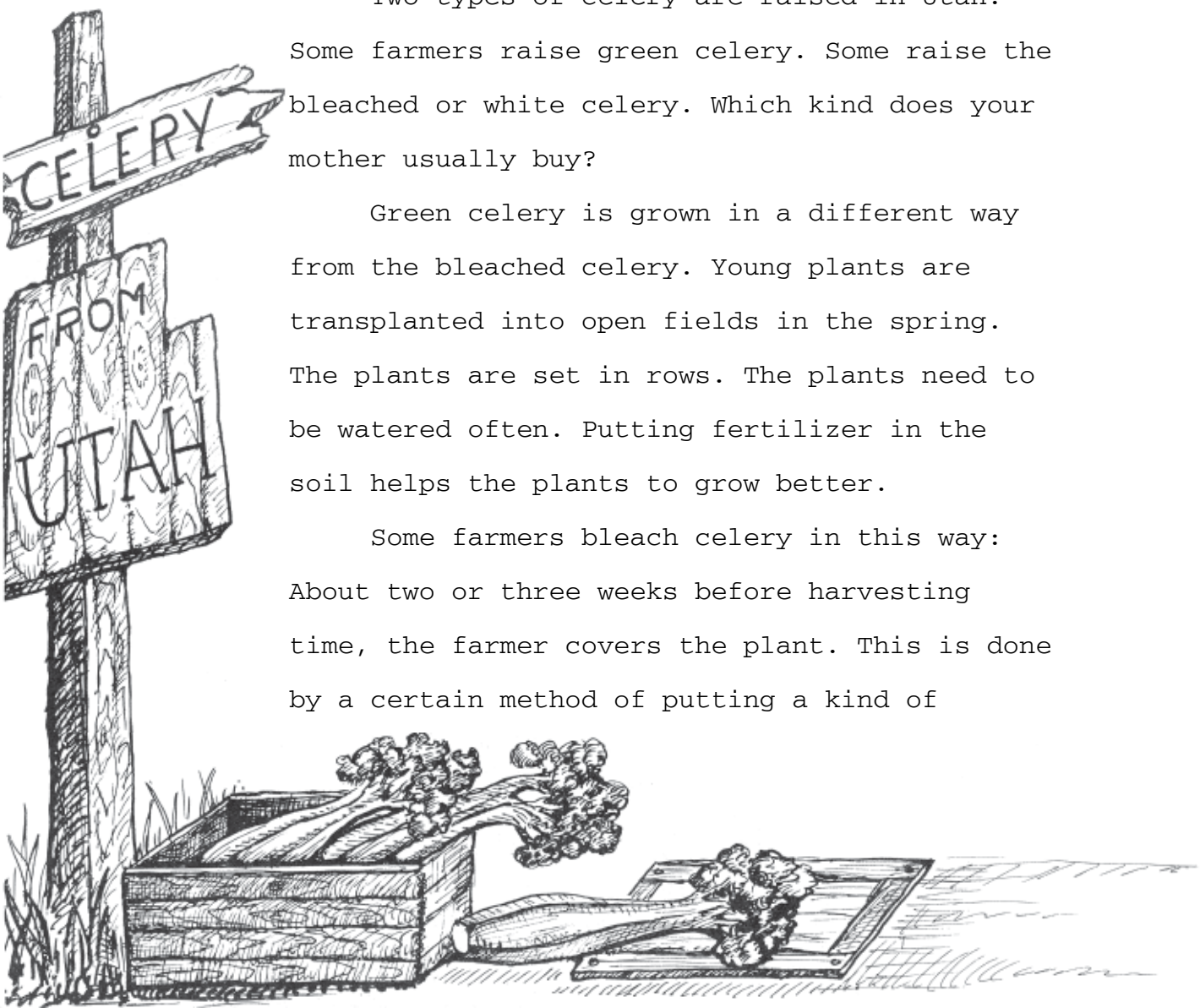
CELERY

Utah celery is a GREEN TREASURE known throughout the entire United States. In fact, a week is set aside each year that is known as Utah Celery Week. During this time people are encouraged to eat celery. They are also encouraged to send gift packages to their friends and relatives who live outside of Utah.

Two types of celery are raised in Utah. Some farmers raise green celery. Some raise the bleached or white celery. Which kind does your mother usually buy?

Green celery is grown in a different way from the bleached celery. Young plants are transplanted into open fields in the spring. The plants are set in rows. The plants need to be watered often. Putting fertilizer in the soil helps the plants to grow better.

Some farmers bleach celery in this way: About two or three weeks before harvesting time, the farmer covers the plant. This is done by a certain method of putting a kind of



paper sack over the celery stalks. The sack is put around the plant to keep the sun from reaching it. When the farmer removes the sack after about two weeks' time, the celery is bleached or white. Then it is ready to be harvested and sent to market.

The harvesting begins in late August. After the farmers gather their crops, they clean the celery stalks. Then they trim them, grade them, and pack them into packing crates.

Sometimes all the farmers that raise celery get together and send it to a cooperative packing shed.

Then workers wash the celery, trim and grade it, and pack it. The workers in the picture below are planting celery with the help of a machine.

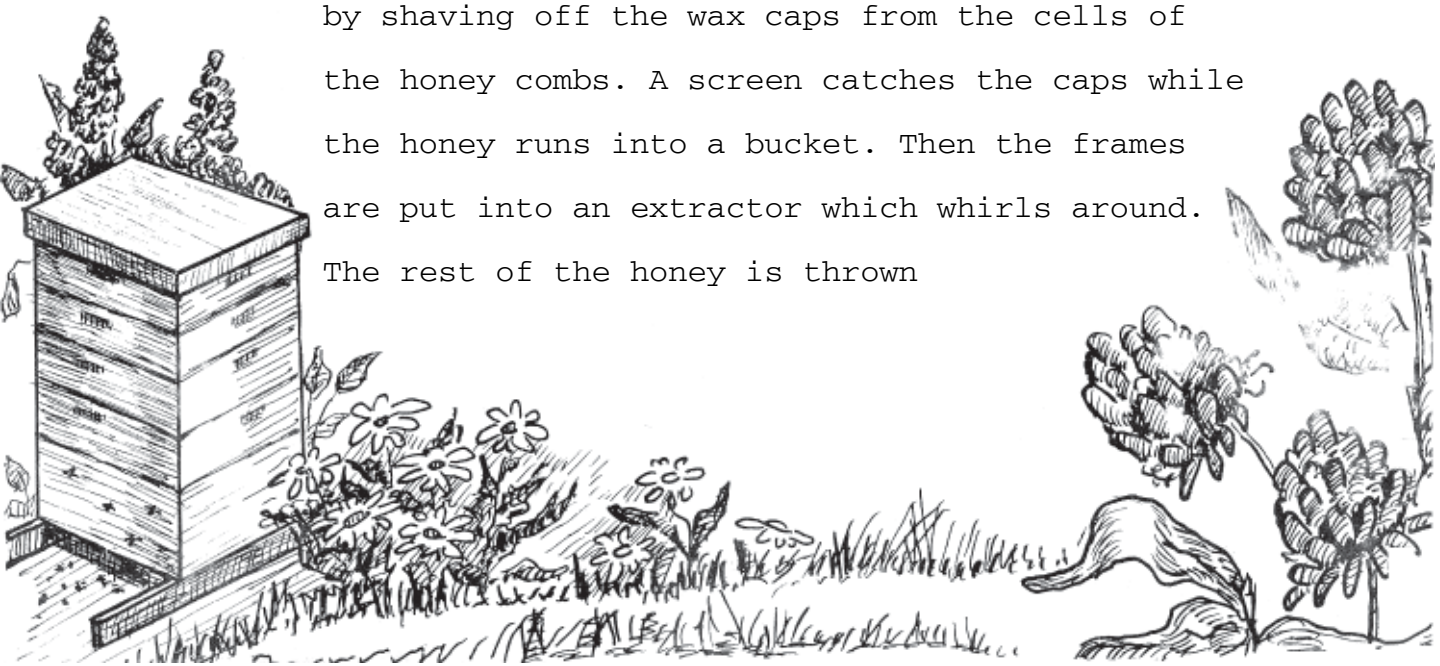
HONEY – A GREEN TREASURE

HONEYBEES

Bees are raised in Utah. Some people raise them for the honey they produce. Some farmers raise them to pollinate their crops. Honey is another one of Utah's GREEN TREASURES.

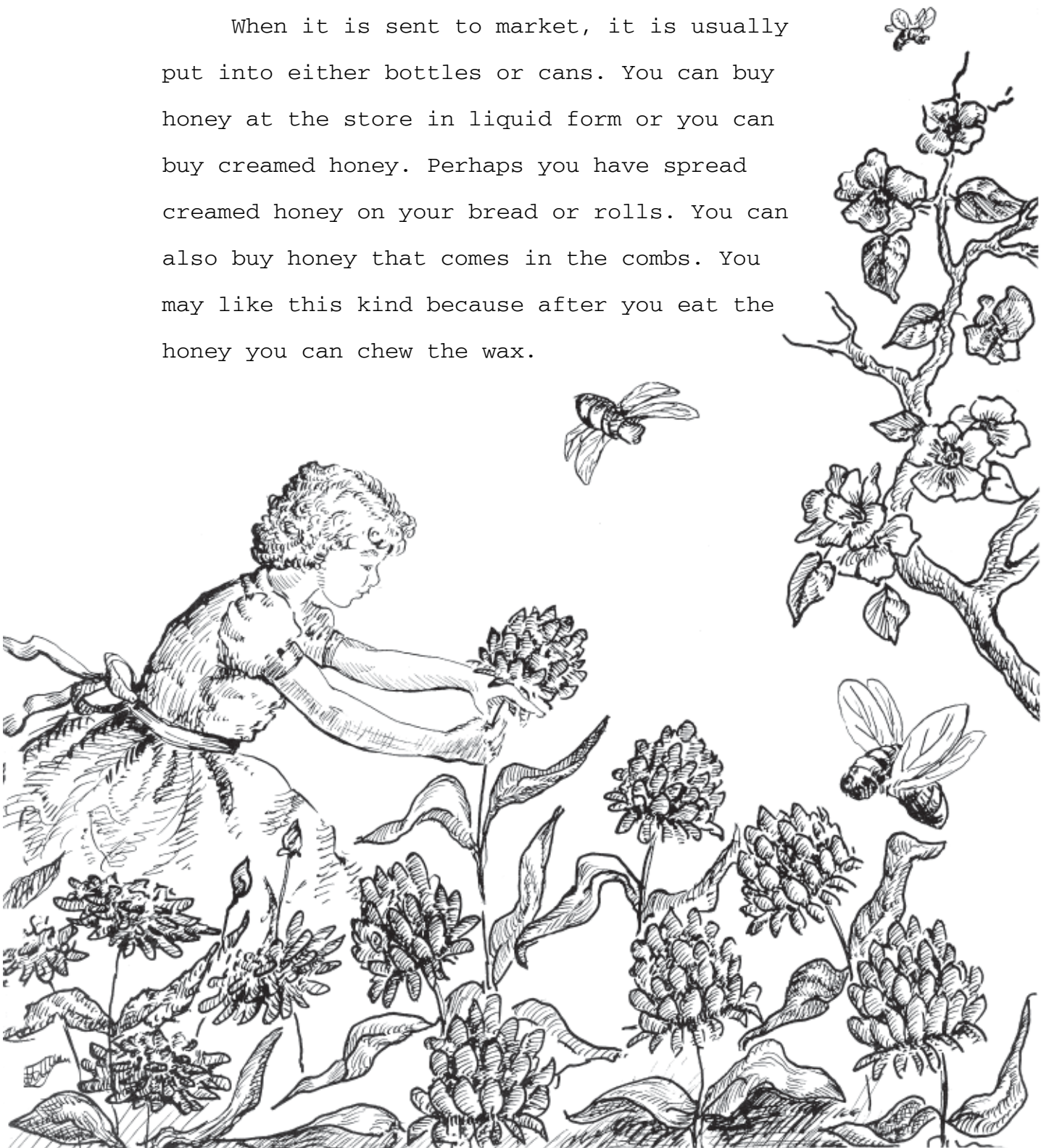
Bees gather from blossoms the nectar which they use in making honey. Honey from alfalfa and clover blossoms has a fine flavor. It is also light in color. Bees store the nectar they gather in the form of honey in wax cells called combs.

The beekeeper gets the honey from the combs by taking from the hives the frames that contain the honey. Then he carries them to a honey house, where he extracts the honey. This is done by shaving off the wax caps from the cells of the honey combs. A screen catches the caps while the honey runs into a bucket. Then the frames are put into an extractor which whirls around. The rest of the honey is thrown



out of the combs. Then the honey is poured into a bucket and strained into a tank.

When it is sent to market, it is usually put into either bottles or cans. You can buy honey at the store in liquid form or you can buy creamed honey. Perhaps you have spread creamed honey on your bread or rolls. You can also buy honey that comes in the combs. You may like this kind because after you eat the honey you can chew the wax.



FRUIT – A GREEN TREASURE

FRUIT

Early in the spring if you should drive along the base of the Wasatch Mountains you would see trees covered with blossoms. Some trees would be covered with white blossoms, while others would be covered with shades of pink blossoms. These fragrant blossoms last only a short time. The flowers gradually develop into plump, ripe fruit. Fruits, too, are part of Utah's GREEN TREASURE.

Utah fruit growers raise a variety of GREEN TREASURE for people to eat. Some fruit is shipped to supply people who live in other states. The fruits that grow well in Utah are pears, peaches, cherries, apples, apricots, and plums.

Fruits are raised mainly in orchards on a narrow strip of bench land along the base of the Wasatch Mountains. This fruit growing region extends from north of Brigham City to south of Payson. But this is not the only place that fruit is raised. There

are other smaller producing areas in the state.

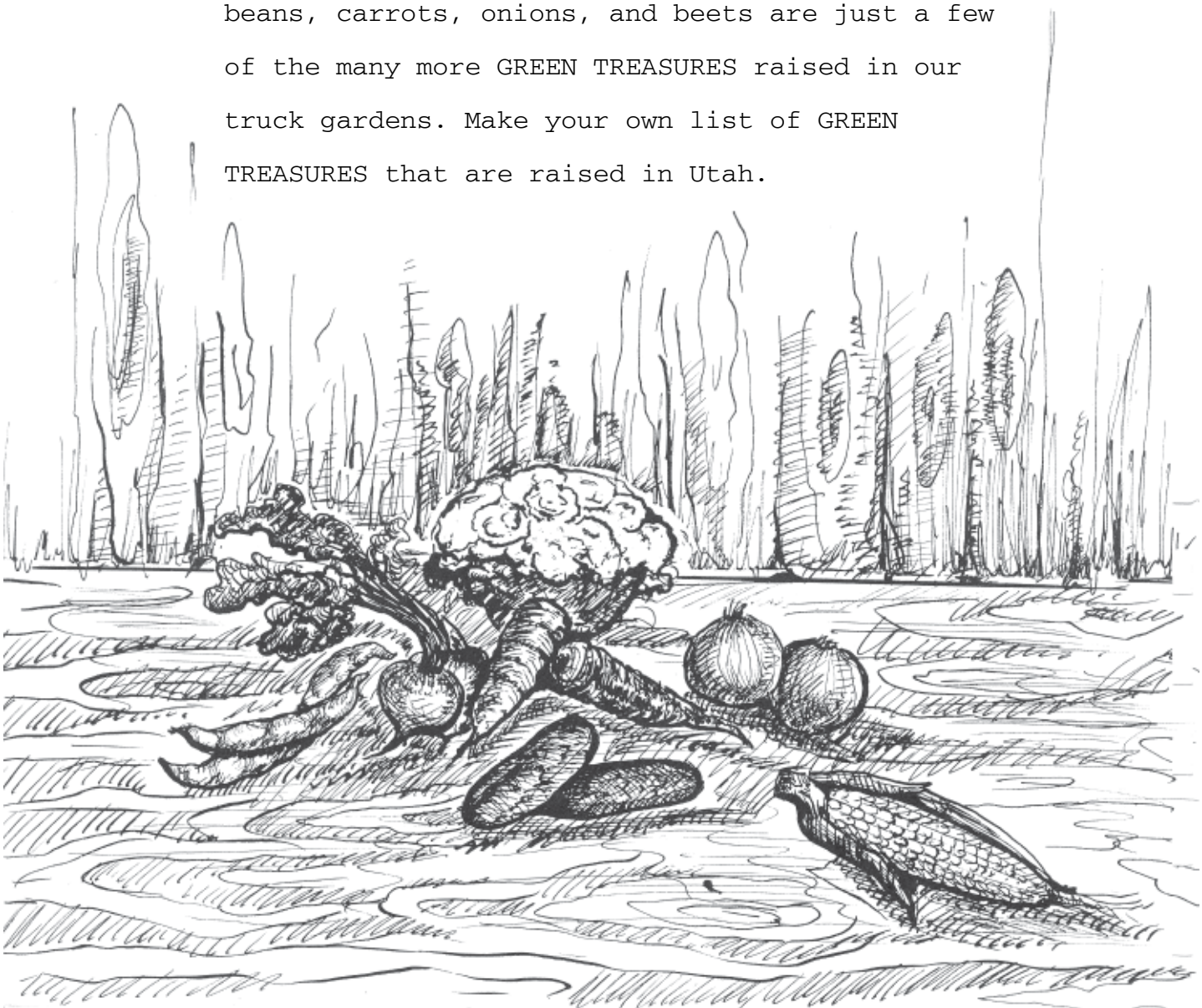
Melons from Greenriver in Emery County are well known for their flavor. Some of these GREEN TREASURES are shipped to large cities in our eastern states.

When did you last have strawberry shortcake for your dinner? Were the strawberries right from your garden? Or did they come from a nearby market? Perhaps they came from Hurricane or Pleasant Grove. There are also several other places in our state where strawberries are grown.

Farmers in Utah raise various other small berries along with their other GREEN TREASURES. These are raspberries, blackberries, dewberries, currants, and gooseberries.

Do you know other GREEN TREASURES that are raised on farm lands in Utah? Tell something about the important food products that are raised in Utah. Perhaps you can tell something interesting about the GREEN TREASURES raised near you.

Farmers raise other food crops than those you have just read about. Snap beans, corn, lima beans, carrots, onions, and beets are just a few of the many more GREEN TREASURES raised in our truck gardens. Make your own list of GREEN TREASURES that are raised in Utah.



DISCOVERING NEW THINGS

1. Make a seed bed in your classroom so that you can raise tomatoes from seeds. You will need a flat box. A berry box will do. Line the box with newspapers and put a layer of sand in the bottom of the box. Then fill the box with loam soil. Plant the seeds. Keep the box where it will get plenty of light. Water the seeds often enough to keep the soil moist but not too wet. When the plants are about two inches high, transplant them. Put each plant into a paper cup or tin can. When the plants are about six inches tall, again transplant them carefully to your own garden. Be certain that the danger of frost is over.

2. Find out how farmers near you protect their GREEN TREASURES from sudden frosts.

3. Make a products map of your county, including all the GREEN TREASURES raised there. You may want to write to your county agent for information.

4. Keep a picture record showing the changes fruit trees make from early spring to late autumn.


CARING FOR
GREEN TREASURE
MEATS
CANNED FOODS
GROCERIES
ONIONS
AVACADO
ORANGES
FROZEN
FOODS
BREAD

REACHING FOR A PACKAGE

You will find me on a shelf. I may be different sizes and shapes. I may be made of cardboard, glass, or metal. Sometimes you can look inside me. I have a brightly colored picture pasted on me. I'm full of good things to eat. What am I? PACKAGED FOODS! You've probably guessed by now that I am a package.

Most of us cannot remember when we could not go into a grocery store to buy food that has been packaged. No doubt you have selected canned foods many times. There is a variety of vegetables and fruits on the grocer's shelves from which you can choose. If you look at the labels on the cans, you can tell what is inside each one. GREEN TREASURES are put in many different kinds of packages.

The next time you go to a food store notice what foods are carefully packaged in transparent sacks. You can easily see the contents.

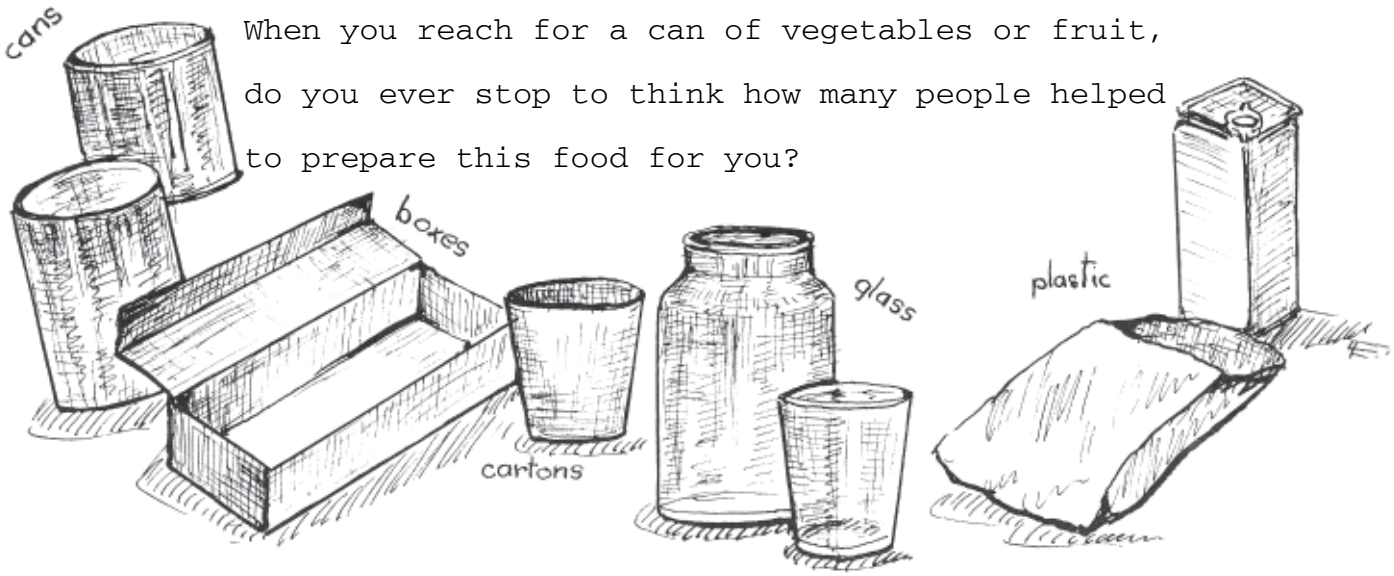
Or look for kinds of foods that are put in cardboard boxes. You will find all sizes. Some

cardboard or paper containers are liquid-proof. A special paraffin wax is applied to these so that they will hold liquids. You may buy milk from your local store in one of these packages.

We are finding that GREEN TREASURES are put in small cardboard containers and frozen. More and more containers are also being made of metal. These frozen foods are kept in special storage compartments that are set at a very low temperature.

Have you ever reached down into a frozen food case and felt the cool air rush up to meet your face? The next time you visit the store, make a list of the foods that are kept in the refrigerated case. See how many foods are packaged in cans.

People have learned to package foods so they will be safe as well as clean for you to eat. When you reach for a can of vegetables or fruit, do you ever stop to think how many people helped to prepare this food for you?

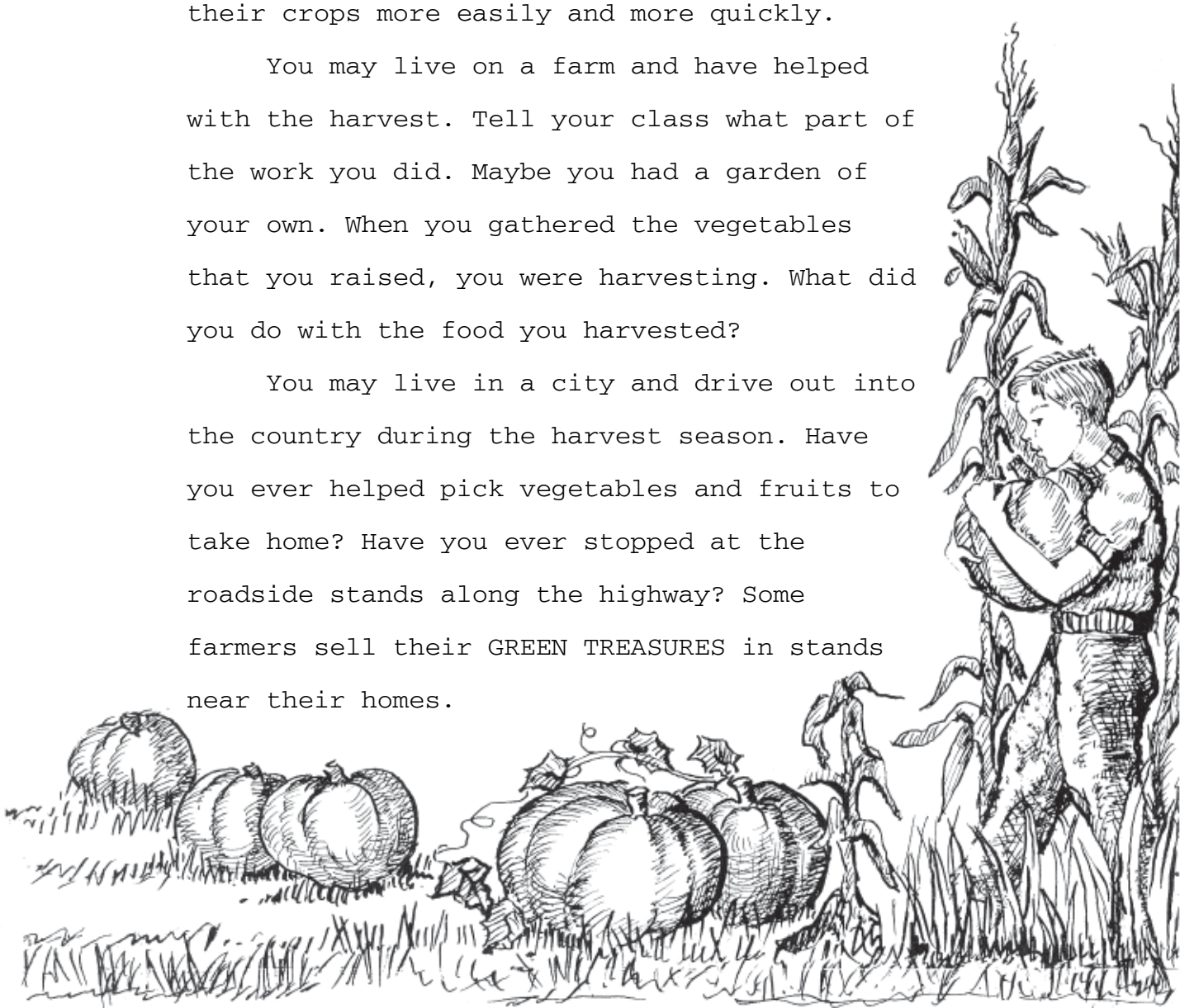


HARVEST TIME

Let's think about the harvest season. During this time farmers are busy gathering their crops of food. New methods have made it possible for farmers to grow bigger crops. Some crops like sugar beets and corn once had to be picked by hand. Now machines help the farmers with their work. They can harvest their crops more easily and more quickly.

You may live on a farm and have helped with the harvest. Tell your class what part of the work you did. Maybe you had a garden of your own. When you gathered the vegetables that you raised, you were harvesting. What did you do with the food you harvested?

You may live in a city and drive out into the country during the harvest season. Have you ever helped pick vegetables and fruits to take home? Have you ever stopped at the roadside stands along the highway? Some farmers sell their GREEN TREASURES in stands near their homes.

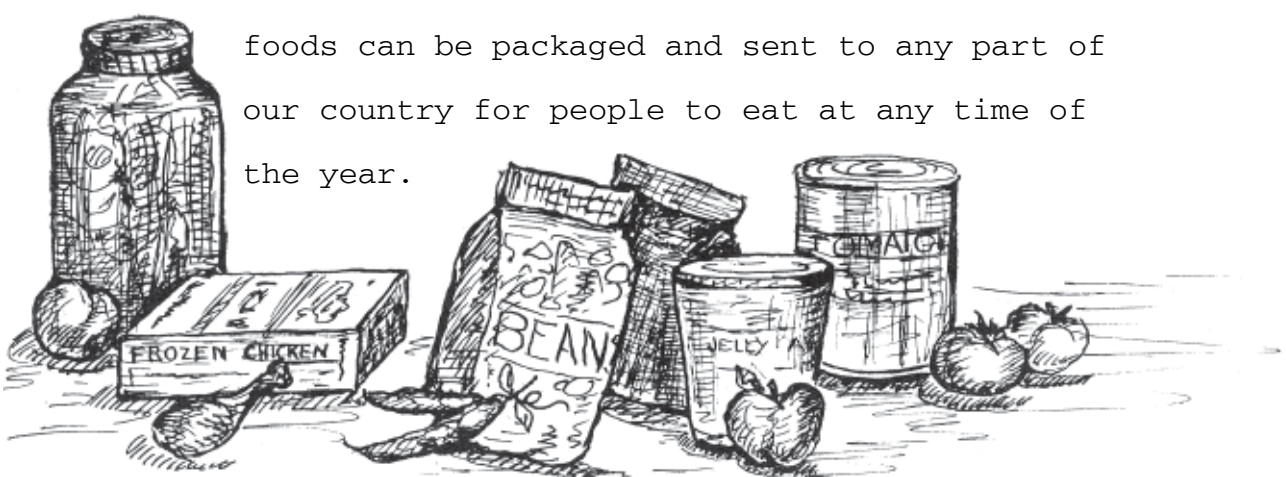


A VARIETY OF FOOD

After the crops are harvested, most of them must be kept in some way for us to use later on. There was a time when certain foods were not available throughout the year. People living where foods could not be grown during certain seasons had a hard time eating a variety of foods. When certain foods were plentiful, they ate heartily. They did not know how to keep food for other times.

Now people have found ways of preserving and storing food by using many different kinds of packages. This makes it possible for us to have a variety of foods any time during the year.

We depend upon the food raised in other places to supply us with fresh foods during the season when they are not growing here. We also depend upon other places to supply us with foods that cannot be grown in Utah. These foods can be packaged and sent to any part of our country for people to eat at any time of the year.



WHAT MAKES GREEN TREASURE SPOIL

Have you ever reached into a basket of apples and picked out one that had a soft, brown spot on it? Then did you look more closely at the other apples that were around it? Did you find that these, too, had soft, brown spots? We usually say that apples like these are rotten. They are not good to eat unless the part which is spoiled is cut out.

After food crops are harvested, they spoil quickly unless they are cared for. Some of our foods must be stored until they are needed. They must be protected so they will be safe to eat.

It took a long time before someone found out what caused foods to spoil. Before bacteria were known, people knew only a few ways of keeping food for later use. Some of these early methods of storing food are still used. Today other ways of keeping foods from spoiling have been discovered.

Keeping foods safe to eat means keeping them fresh and clean. It also means keeping them from being spoiled by bacteria, yeasts, and molds. Shall we see how some tiny plants spoil food?

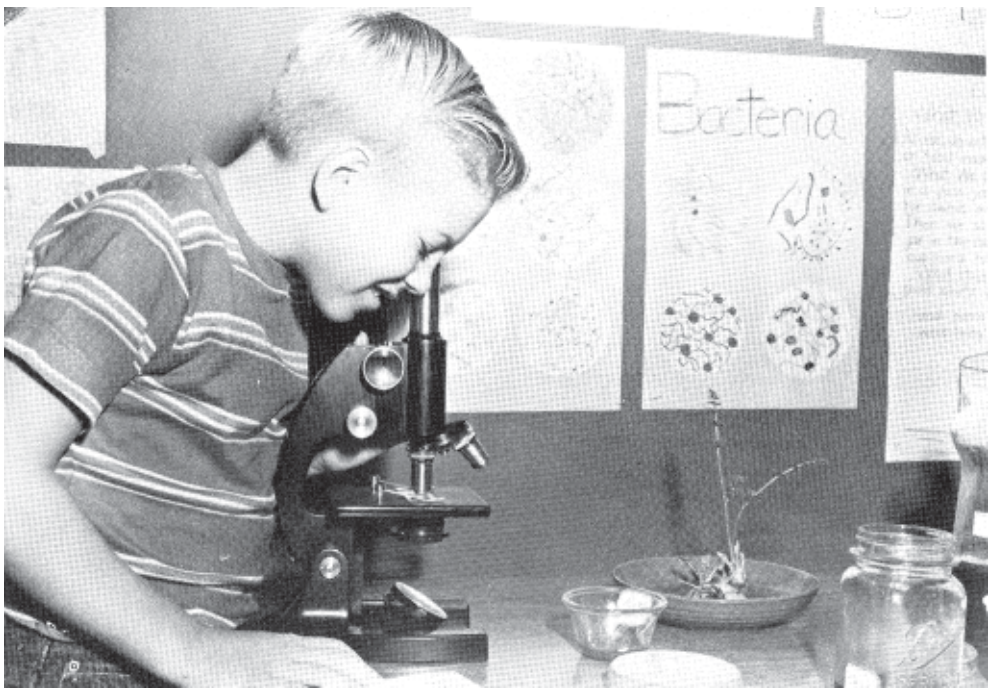
BACTERIA

Bacteria cause certain fruits and vegetables to rot. Bacteria are tiny organisms that can be seen only under a powerful microscope.

Bacteria are almost everywhere. Most raw foods are covered with them. Bacteria live in soil, water, and air. Bacteria will grow in almost any place.

Only a few kinds of bacteria are harmful. Most kinds are useful. Some useful bacteria are necessary for certain plants to grow. Some useful bacteria are planted in food. They are necessary in making butter, cheese, and vinegar.

The boy in the picture is looking through a microscope. He is looking at tiny life forms that can’t be seen in any other way.

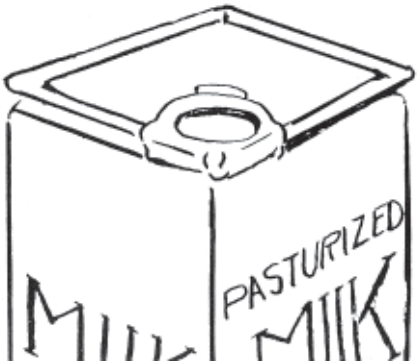


DISCOVERING BACTERIA

People have not always known about bacteria. When food spoiled years ago, no one knew why it did. The first person who found out about these tiny forms of life was Louis Pasteur. You probably have heard his name many times. He was a famous French scientist who was born in 1822 and died in 1895. He carried on many experiments. He learned about bacteria and how they grow. His work has been useful to all of us.

These are some of the things that Louis Pasteur found out about bacteria: He learned that bacteria cause food to spoil. He found out that bacteria are in the air. By experimenting with fresh fruit juice he found that it would not turn sour if it were kept away from the air. He also found that bacteria caused milk to sour.

Do you know the name of the process that is now used to make milk safe for us to drink? Pasteurizing kills the harmful bacteria in milk. Perhaps you can visit a dairy and watch how modern machines pasteurize milk.



GROWING BACTERIA

UNOPENED

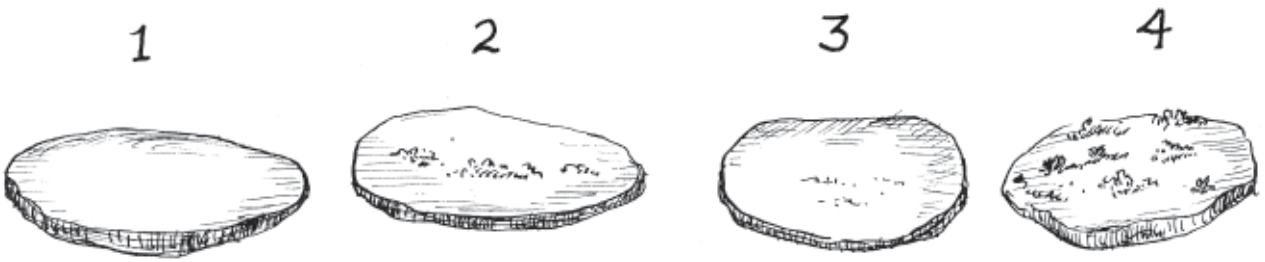
DIRTY HANDS

CLEAN HANDS

DUST ADDED

You can do some experiments that will help you learn about bacteria. You can plant some bacteria and watch them grow. Sterilize four glass jars by boiling them for at least fifteen minutes. Now cut a raw potato and put a slice in each bottle. Seal the jars and put them in boiling water again for at least thirty minutes. Boiling will kill most bacteria, but some can be boiled for hours and still live!

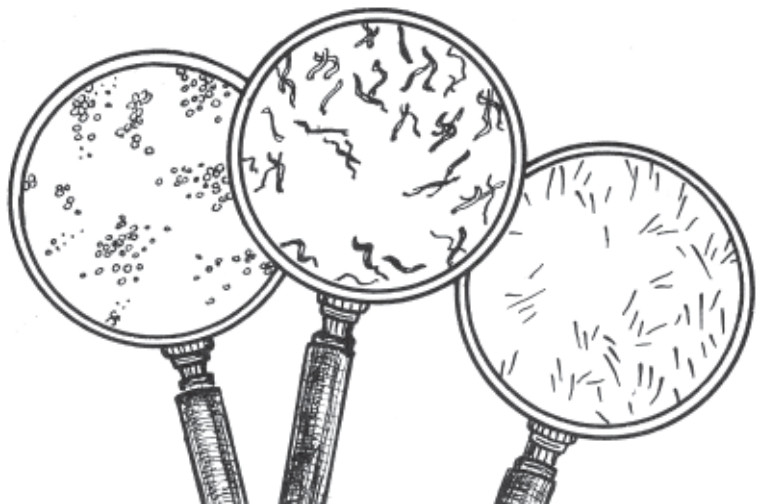
Then take the jars out of the water and leave one unopened. Open one jar and touch the slice of potato with your unwashed finger. Then put the lid on tightly. Wash your hands well. Then open another jar and touch the potato. Screw the lid on this jar. Open the other jar and shake some dust on the potato. Close this jar tightly too. Label each jar so you will know how you planted the bacteria in each one. Set the jars in a warm, dark place for a few days. Look at the slices of potato. You may see some yellowish or white



spots growing on them. These are groups of bacteria. You cannot see bacteria without a microscope. But if you should look at bacteria under a microscope they would look much like those you see in the illustration below. When bacteria are growing together in groups as they are in the experiment you did, you can easily see them.

Notice if there is any difference in the potato slice that you touched with your unwashed finger and the one you touched with the clean finger. Look at the growth in the jar containing dust. There usually will be no growth in the jar that was left unopened. Can you think why?

This experiment should tell you why it is important to wash your hands before you touch food. When bacteria have some food to live on and have warmth and moisture, they will grow. Do you also see why it is important to handle food properly and to keep it very clean?



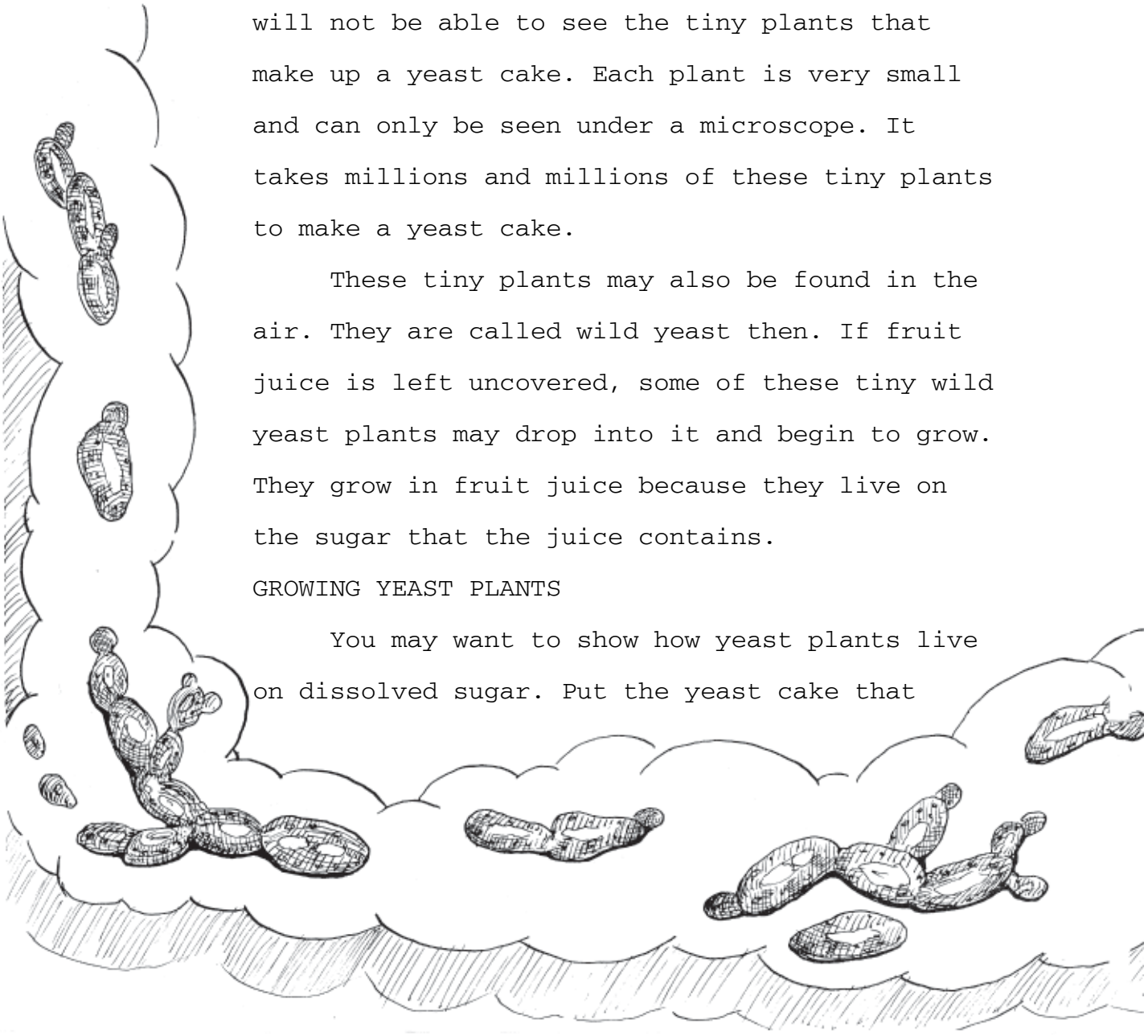
YEASTS

Did you know that the yeast cake your mother buys at the store is really made up of tiny living plants? See if you can get a yeast cake that you can examine. Crumble part of it in your hands. Even if you look very closely you will not be able to see the tiny plants that make up a yeast cake. Each plant is very small and can only be seen under a microscope. It takes millions and millions of these tiny plants to make a yeast cake.

These tiny plants may also be found in the air. They are called wild yeast then. If fruit juice is left uncovered, some of these tiny wild yeast plants may drop into it and begin to grow. They grow in fruit juice because they live on the sugar that the juice contains.

GROWING YEAST PLANTS

You may want to show how yeast plants live on dissolved sugar. Put the yeast cake that

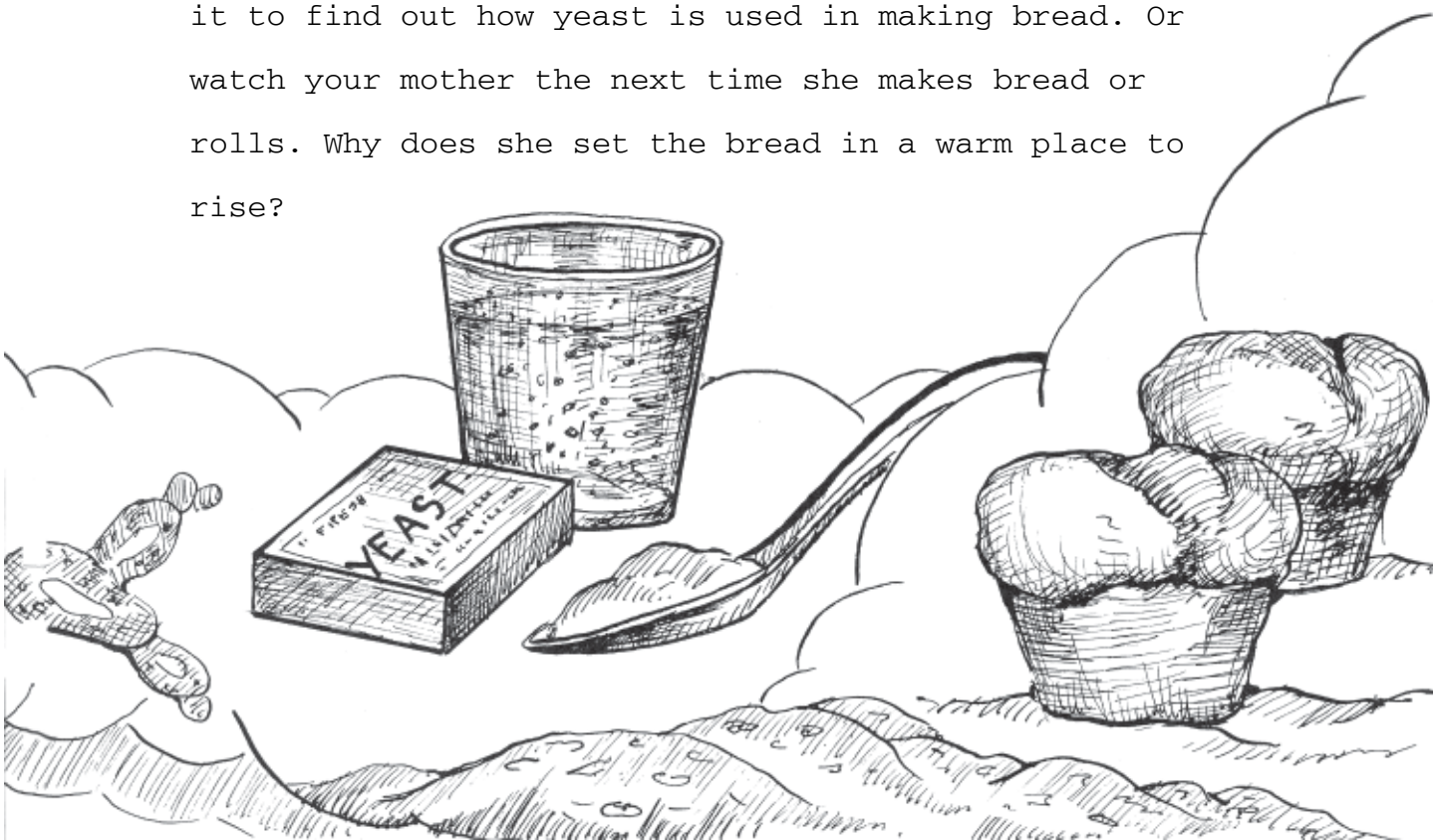


you crumbled into a glass jar. Pour a cup of warm water into the jar. Stir or shake it until the yeast cake has dissolved.

Now add one tablespoon of sugar. Close the jar, but not tightly, and put it in a warm place for a few hours. Observe what happens. Do you see tiny bubbles? They are carbon dioxide gas. Yeast plants give off carbon dioxide as they grow.

This is what happens when bread is made. The yeast is mixed with flour and sugar. The yeast produces carbon dioxide gas. When bubbles of gas are given off, it makes the dough rise.

If there is a bakery near where you live, visit it to find out how yeast is used in making bread. Or watch your mother the next time she makes bread or rolls. Why does she set the bread in a warm place to rise?

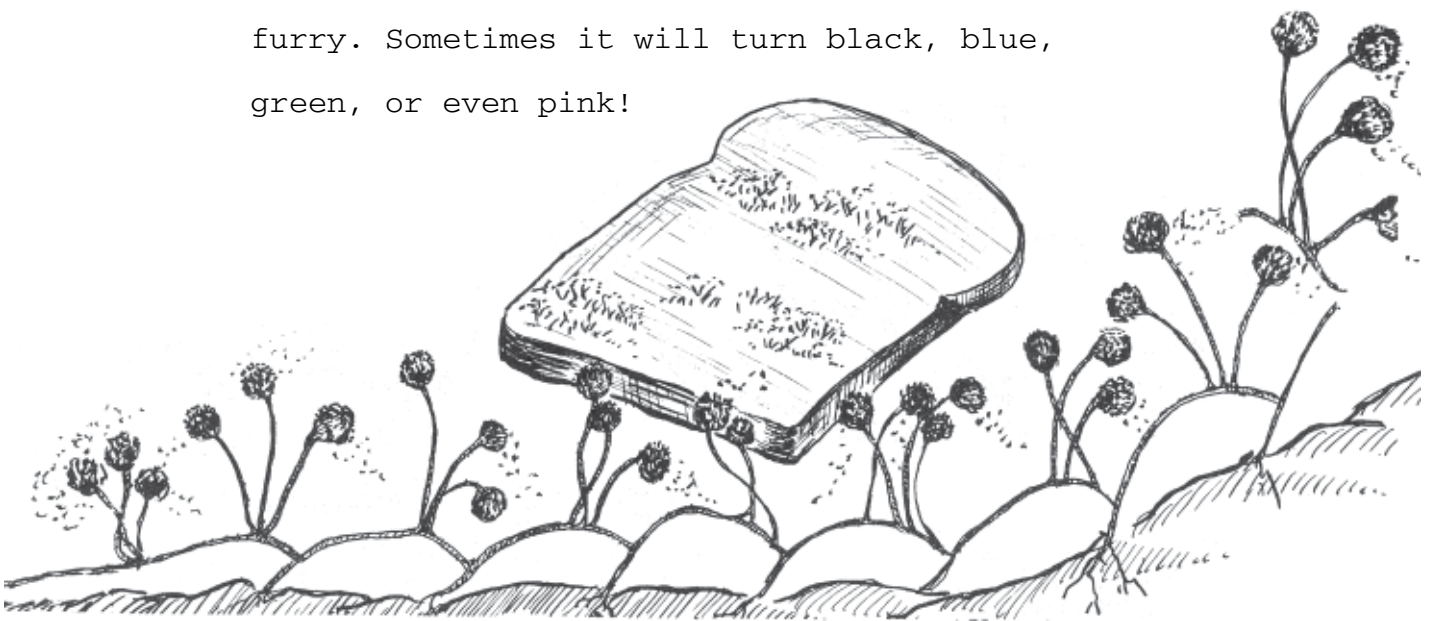


MOLDS

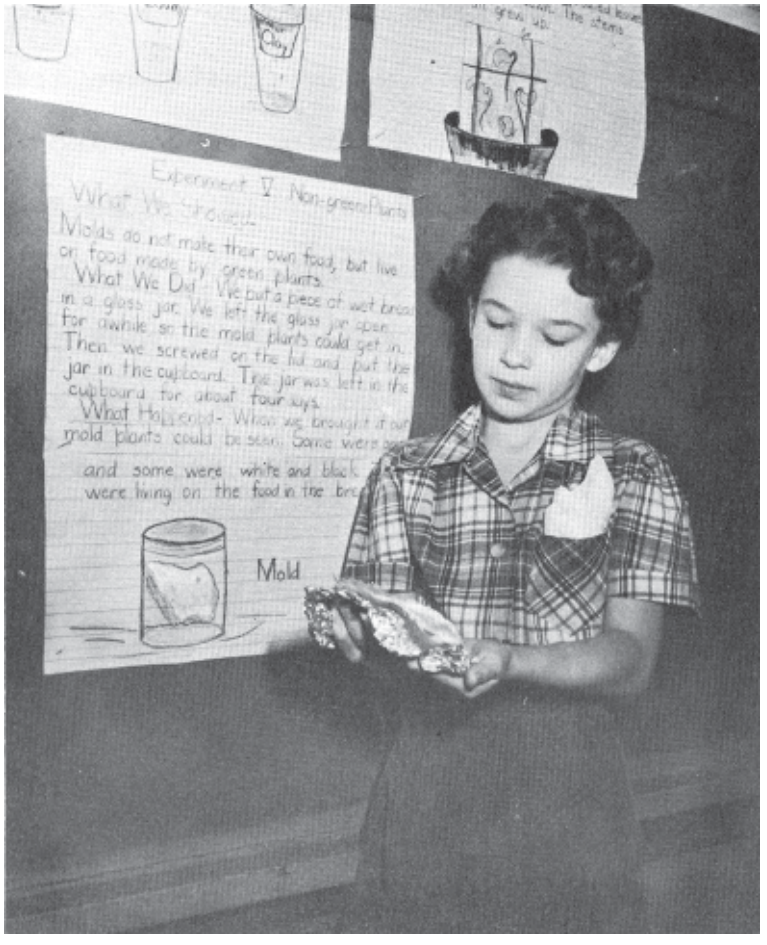
A mold is a different kind of plant that causes GREEN TREASURE to spoil. It does not have roots, nor seeds, nor can it make its own food as most plants do. Each small plant grows from a tiny spore. There are many spores in the air, but we cannot see them. If spores drop on some foods, they will grow into mold plants. They need a warm, moist place to grow. As the spores begin to grow, they cause the food to spoil.

GROWING MOLDS

Mold is very easy to grow. You can watch it grow by bringing a piece of bread from home. Moisten the bread with a little water and put it under a cover. Now put it in a warm, dark place for a few days. When you bring it out, you will see something that looks black, white, and furry. Sometimes it will turn black, blue, green, or even pink!



If you examine a piece of mold under a magnifying glass, you will see grayish-white, hair-like structures. These act like roots and take food from the bread or whatever they are growing on. Now look for the black specks. The black specks are really spore cases which contain the spores. These break open and the spores drift into the air. If they light on certain foods, they begin to grow. The girl in the picture below has some mold that she grew on a piece of bread.



PROTECTING GREEN TREASURES FROM SPOILING

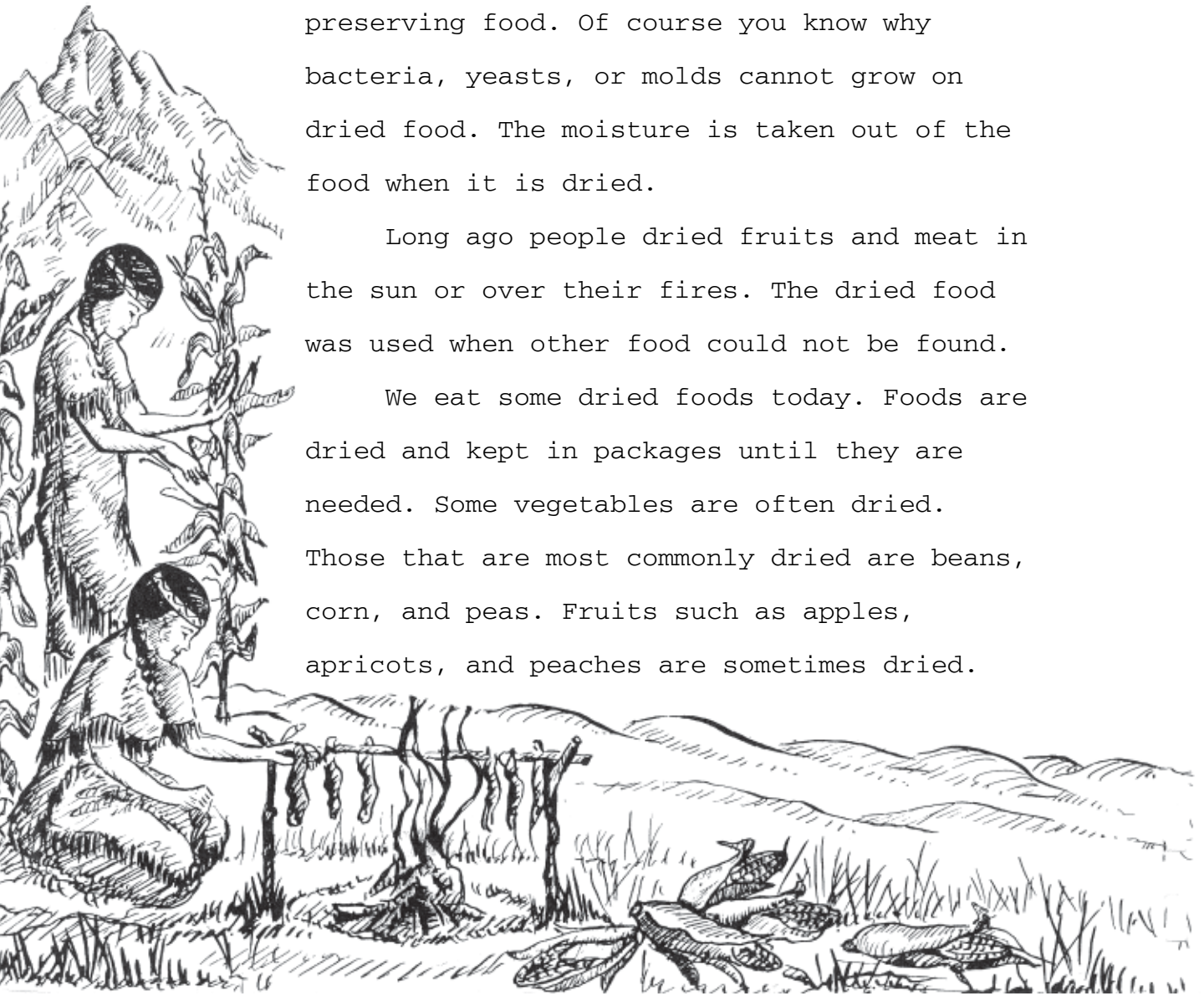
People have discovered that there are different ways to prevent bacteria, yeasts, and molds from spoiling food. Let's find out how GREEN TREASURES are protected from these tiny plants.

DRYING FOODS

Drying is one of the oldest ways of preserving food. Of course you know why bacteria, yeasts, or molds cannot grow on dried food. The moisture is taken out of the food when it is dried.

Long ago people dried fruits and meat in the sun or over their fires. The dried food was used when other food could not be found.

We eat some dried foods today. Foods are dried and kept in packages until they are needed. Some vegetables are often dried. Those that are most commonly dried are beans, corn, and peas. Fruits such as apples, apricots, and peaches are sometimes dried.



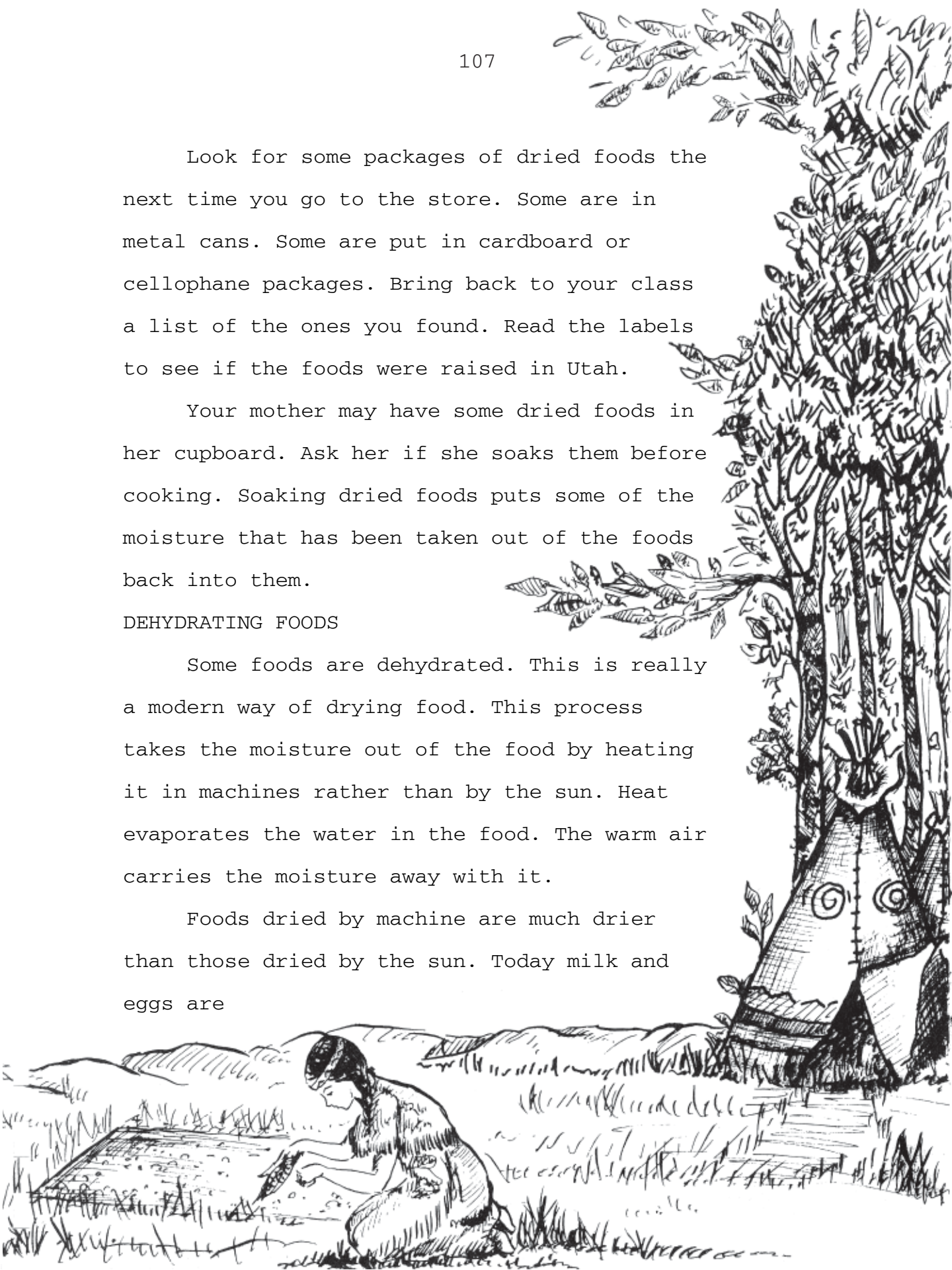
Look for some packages of dried foods the next time you go to the store. Some are in metal cans. Some are put in cardboard or cellophane packages. Bring back to your class a list of the ones you found. Read the labels to see if the foods were raised in Utah.

Your mother may have some dried foods in her cupboard. Ask her if she soaks them before cooking. Soaking dried foods puts some of the moisture that has been taken out of the foods back into them.

DEHYDRATING FOODS

Some foods are dehydrated. This is really a modern way of drying food. This process takes the moisture out of the food by heating it in machines rather than by the sun. Heat evaporates the water in the food. The warm air carries the moisture away with it.

Foods dried by machine are much drier than those dried by the sun. Today milk and eggs are



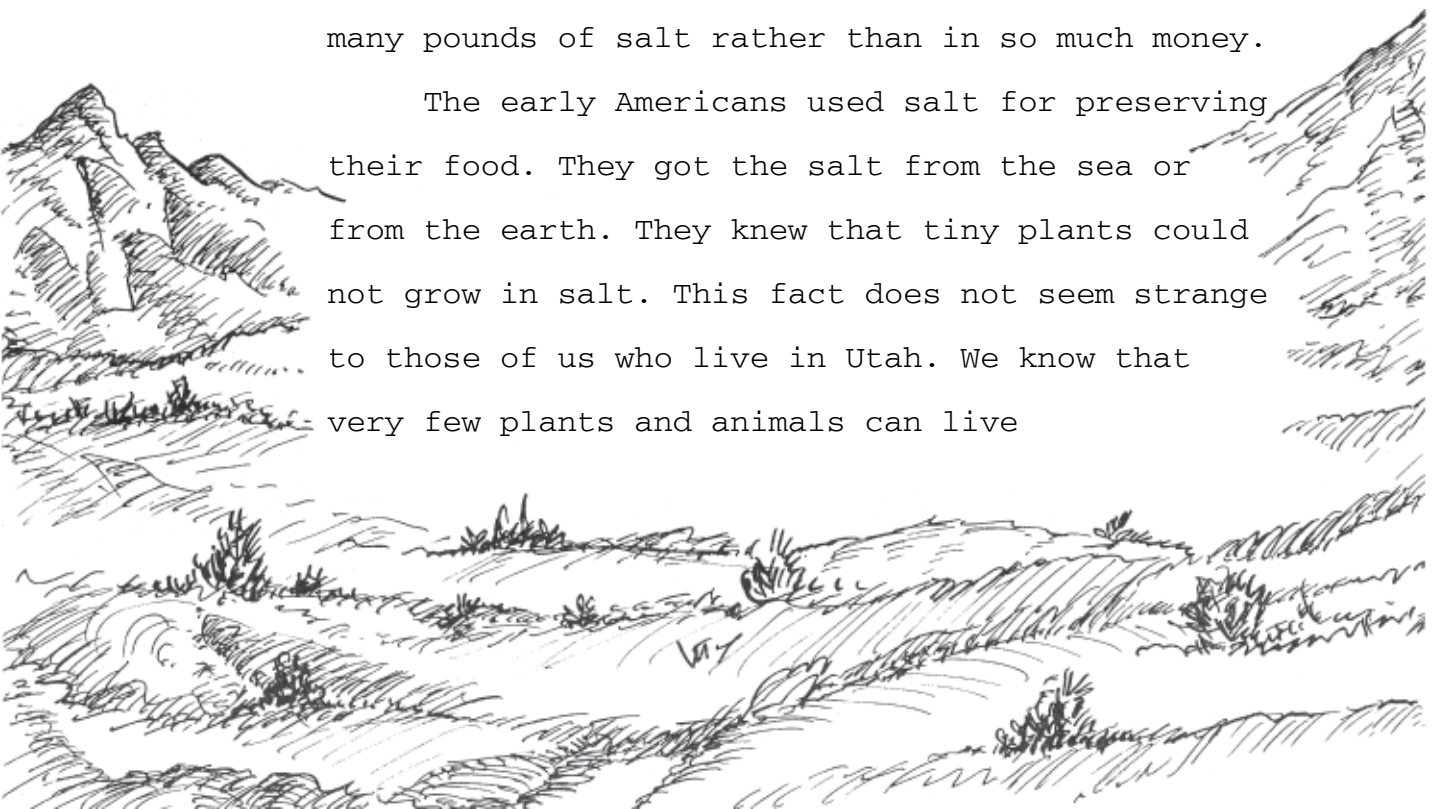
being dehydrated and sent to market. You do not often see these in your local food stores. Do you know who buys dried milk or eggs? Bakeries often use these dehydrated products.

You will find other dehydrated foods on the shelves in your local stores. Soups, vegetables, and some fruits can be bought this way. Tiny plants cannot grow on dehydrated foods. Now you know why.

SALTING FOODS

Salt has been used for many years to keep some foods safe to eat. The ancient Romans used salt to preserve food. In those days some people even used salt as money. Workers were paid in so many pounds of salt rather than in so much money.

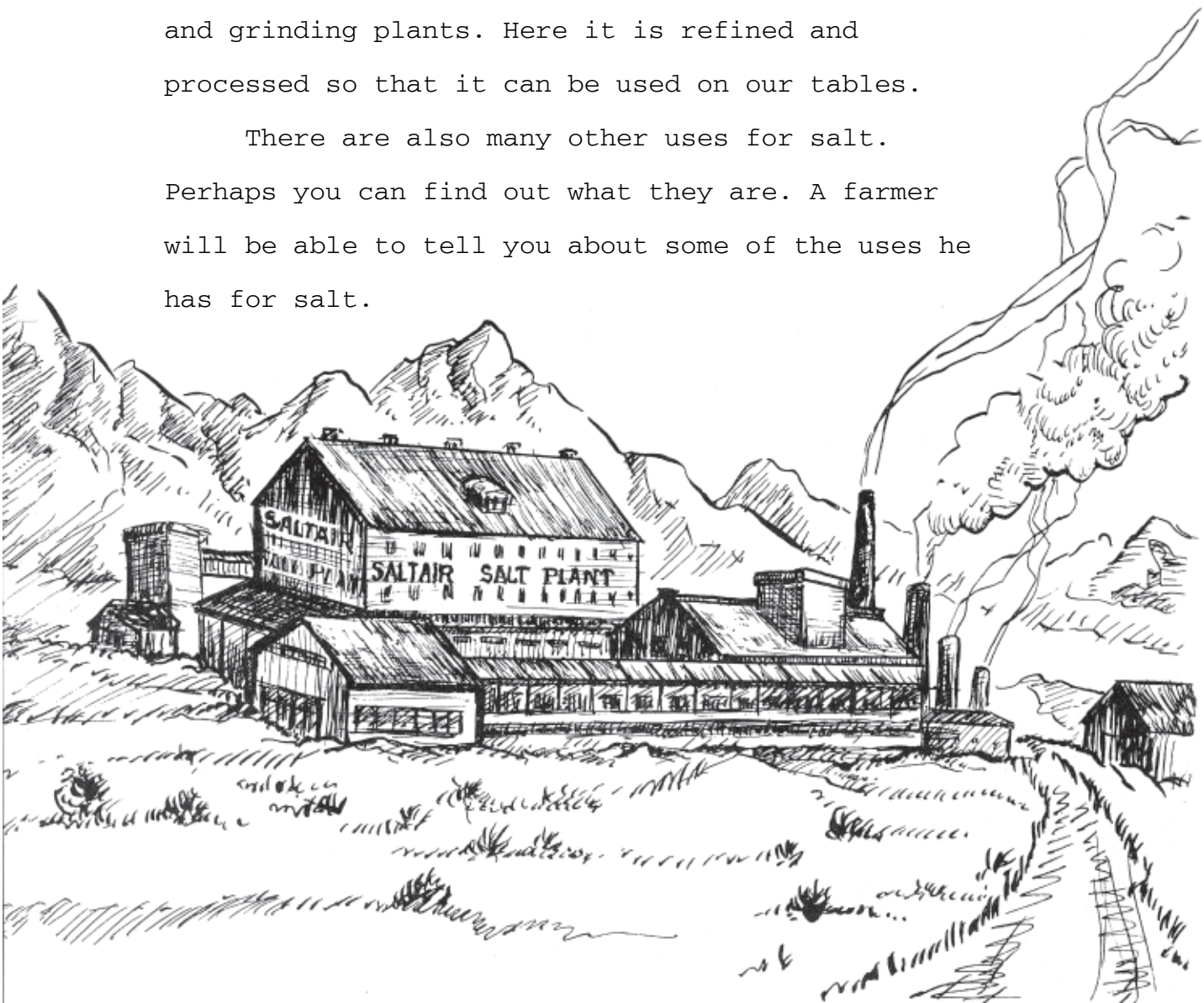
The early Americans used salt for preserving their food. They got the salt from the sea or from the earth. They knew that tiny plants could not grow in salt. This fact does not seem strange to those of us who live in Utah. We know that very few plants and animals can live



in Great Salt Lake. Great Salt Lake contains more salt than any other body of water its size in the world.

Salt companies in Utah harvest the salt from Great Salt Lake. Water from Great Salt Lake is pumped into large ponds. The water evaporates, leaving a layer of salt. Tons of this salt are piled up by machines. Then it is taken to drying and grinding plants. Here it is refined and processed so that it can be used on our tables.

There are also many other uses for salt. Perhaps you can find out what they are. A farmer will be able to tell you about some of the uses he has for salt.



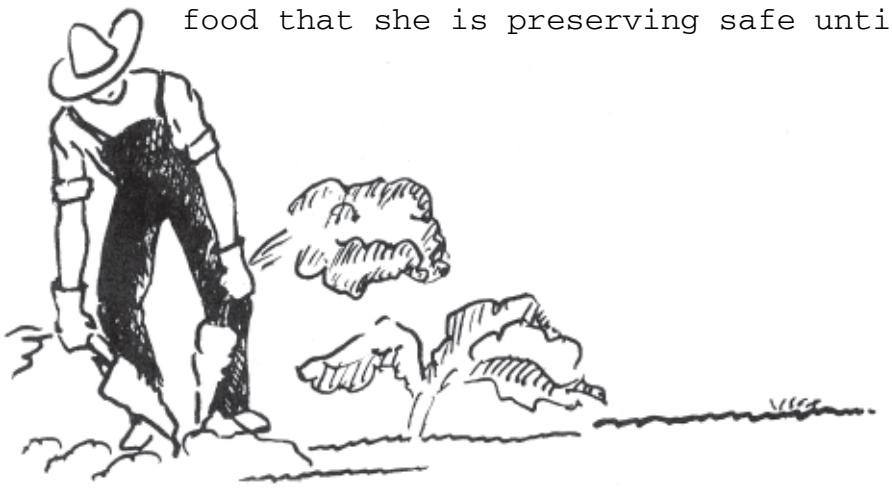
USING VINEGAR

Vinegar has been used for a long time to preserve certain foods. Only a few special bacteria can grow in foods containing vinegar. The people that first came to America made vinegar from the juice of apples.

Can you name some foods that we preserve with vinegar today? Do not forget to name fish along with certain fruits and vegetables. Vinegar is sour and changes the flavor of food. That is why it is used only on certain foods.

USING SUGAR

Have you ever watched your mother make jelly? How much sugar does she use? Sugar is used for preserving fruits, fruit juices, and some vegetables. Of course your mother does not use as much sugar in preserving some foods as she does in others. She learns the amount that will keep the food that she is preserving safe until it is needed.



Most bacteria and molds will not grow and spoil foods when sugar is used.

In Utah we use mainly sugar that comes from the sugar beets that are raised here. We use sugar not only to preserve foods, but we use it to sweeten some foods.

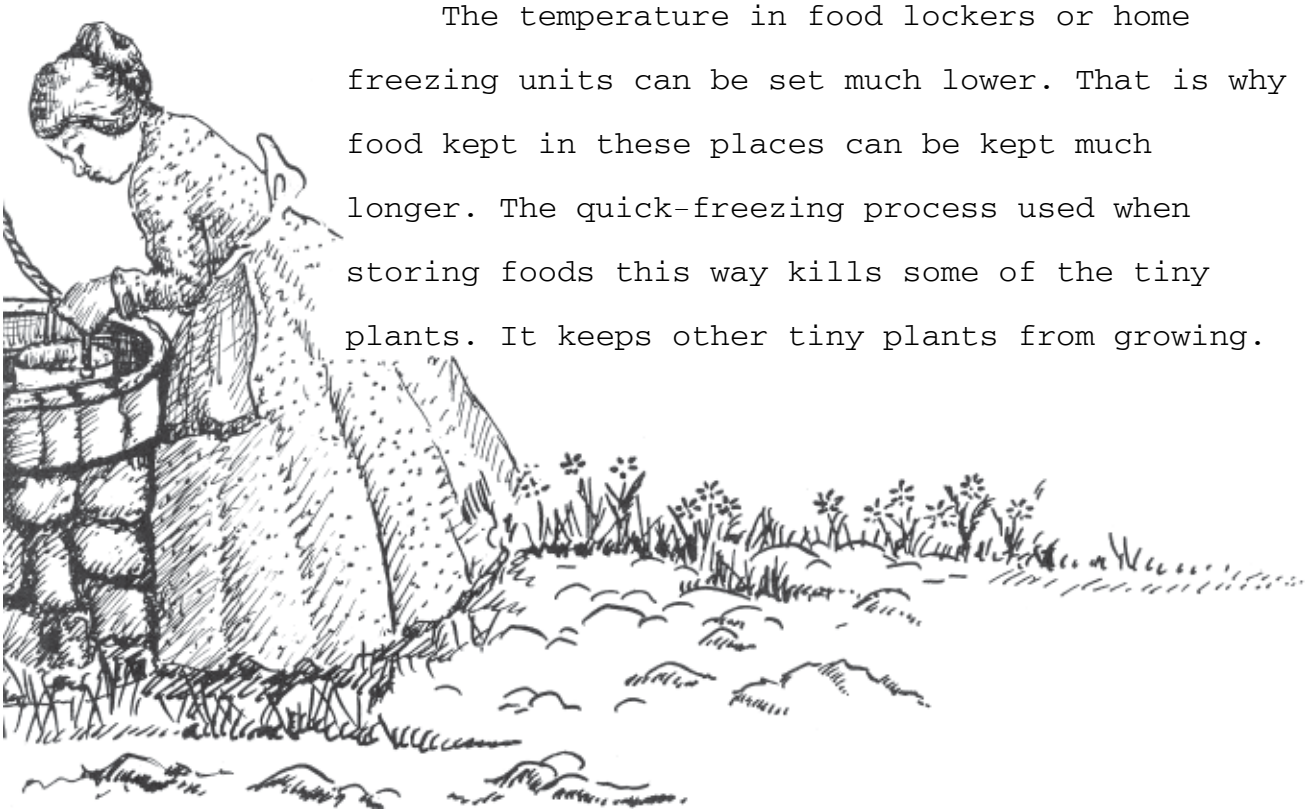
In a sugar refinery the sugar is taken from the beets and processed. If you live near a sugar refinery, visit it in the fall after the beets are harvested. You may want to report your visit to the class.

FREEZING FOODS

Keeping foods cool is not a new way of keeping foods safe to eat. Before refrigerators were built, people knew that foods would not spoil if they were cool. Food was kept in cool cellars and in cool caves. Some people even kept food cool by placing it near running water, or in buckets down in a cool well of water.

Now people store food in refrigerators, home freezing units, and frozen food lockers to keep it from spoiling. The temperature in modern refrigerators is usually not low enough to kill the tiny plants that harm food. It just keeps most of them from growing.

The temperature in food lockers or home freezing units can be set much lower. That is why food kept in these places can be kept much longer. The quick-freezing process used when storing foods this way kills some of the tiny plants. It keeps other tiny plants from growing.

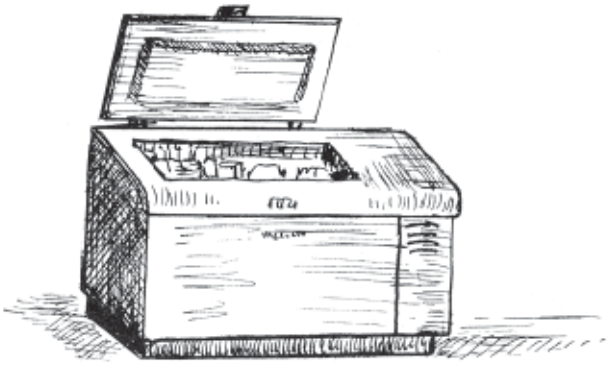


Many foods are now processed by a quick-freezing method. Ways are used to freeze foods so quickly that they are not harmed. When foods are frozen quickly, the moisture in them forms as tiny ice crystals. This does not damage the food. When foods are frozen more slowly they are damaged. When foods that have been quick-frozen are thawed, they are very much like fresh foods from the garden.

You may like to see what happens to food when it is not quick-frozen. To do this freeze a fresh peach or a fresh tomato in the freezing compartment of a refrigerator.

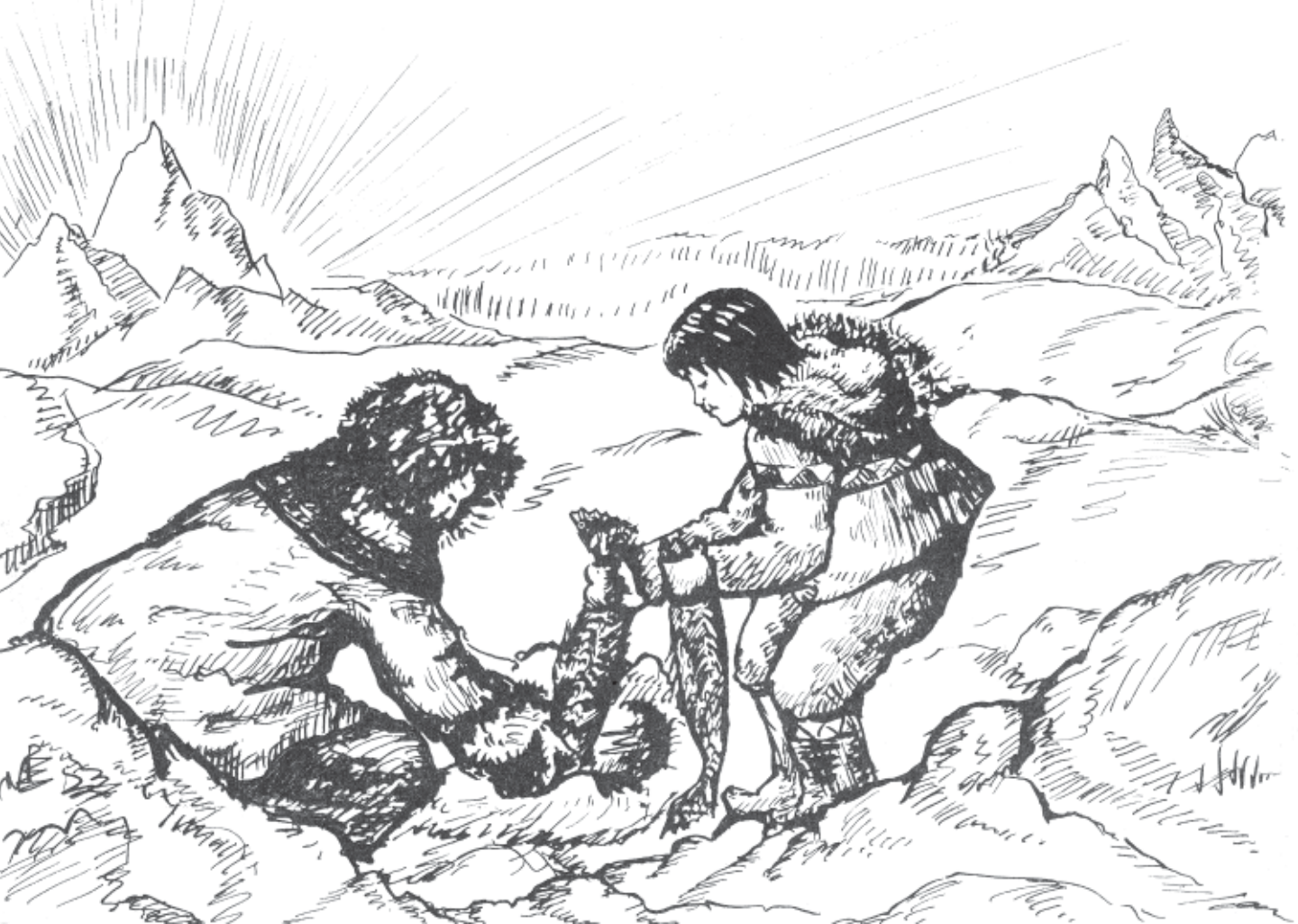
After the peach or tomato is frozen, thaw it out again. You will probably find that it is very mushy. It will also spoil quickly. This is because the slow freezing has damaged the peach or tomato.

If your school doesn’t have a refrigerator, you may like to do this at home. If you do, bring the results and report them to your class.



DISCOVERING HOW TO QUICK FREEZE

German scientists began experimenting with quick freezing in 1916. Later an American, Clarence Birdseye, noticed an interesting thing while he was living in Labrador: Fish frozen very quickly in that cold climate had a better flavor than fish frozen slowly. He continued experimenting and worked especially on ways to package quick-frozen foods like fish, peas, and corn.



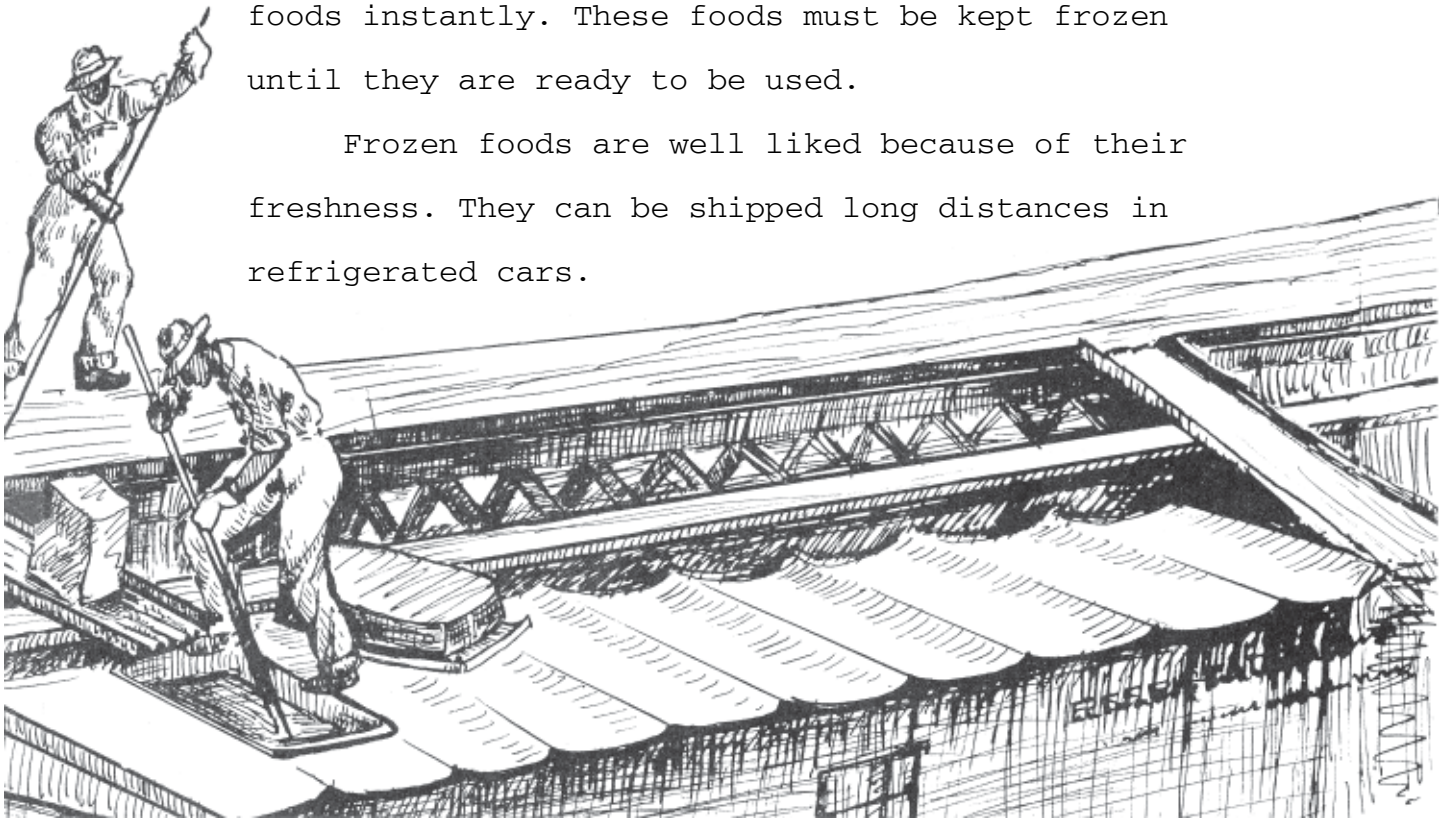
WHERE FOODS ARE FROZEN

You remember that Weber and Utah Counties raise many GREEN TREASURES. To quick-freeze these fruits and vegetables, they are taken to places called frozen food plants. They are located near where the food is raised.

Some vegetables that are usually frozen are peas, corn, and green beans. When fruits are frozen, only the firm, ripe fruits are used. Most fruits must be packed in a liquid syrup. This helps to preserve them. For this reason they are packed in liquid-proof packages or tin cans.

The packages filled with fruits or vegetables are put into machines which freeze the foods instantly. These foods must be kept frozen until they are ready to be used.

Frozen foods are well liked because of their freshness. They can be shipped long distances in refrigerated cars.



ANOTHER WAY TO PROTECT GREEN TREASURE

Nicholas Appert, a candy maker who lived in Paris many years ago, discovered another way to protect foods. He won a prize for this discovery from his government in 1809. He preserved some food in jars that he sealed. Some of this food kept for a long time. But some of the food spoiled and then the jars burst. He did not know what caused the food to spoil. He did not know that there were bacteria in the air. No one knew the influence of bacteria until years later when Louis Pasteur discovered it. Air containing bacteria leaked into the containers that Appert sealed. This caused the food to spoil.

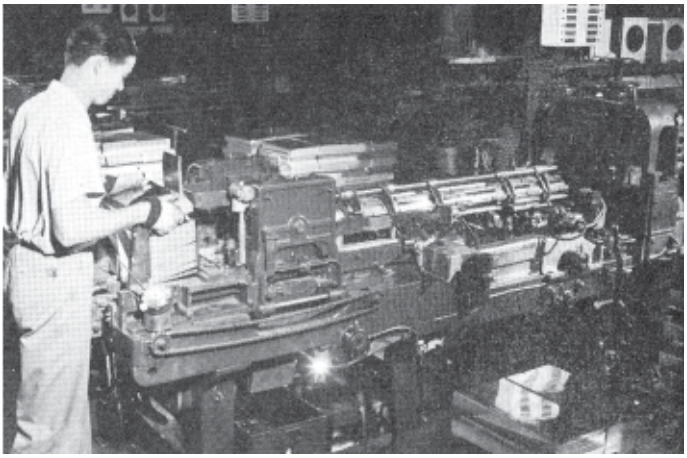
A year later a man living in England named Peter Durand made the first tin can. This started the tin can industry in England. In 1819 people living in America started to make tin cans. But it was not until years later that cans could be made in large numbers.

THE STORY OF CANS

At first it took many hours for a can to be made. About sixty cans were all that could be made by one man in one day. Each can was made by hand. The man in the first picture is closing the top of a can by soldering it.

Today with the help of modern machinery cans are being made at the rate of 300 to 400 a minute. Think of the number of cans that can be made in one day.

A can looks as if it would be very easy to make. But it really takes many machines to put it together. It must be made so it is airtight and remains airtight until it is opened. The machine in the second picture is a body-maker. It makes the body of the can.



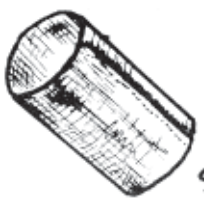
TIN PLATE CUT INTO BODIES AND ENDS .... ROLLED ... HOOKED ..

Did you know that a tin can actually isn't a tin can at all? It is really a steel can. There is just a very thin layer of tin coated on the inside and the outside of the steel can, and often this is covered by a layer of enamel.

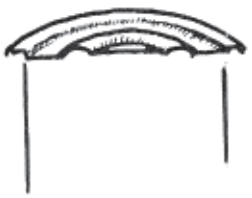
These two layers of tin are only eighty millionths of an inch thick. It would take 12,000 layers that thin to add up to one inch. It is difficult for us to think how very, very thin this layer of tin really is.

Tin is expensive and difficult to get. It must travel a long way before it reaches the factory where cans are made. Our tin comes from Bolivia, Malaya, and Africa. Look at a world map to see how far Utah is from these places. This is one of the reasons why tin is so expensive.

Since tin is so expensive and there is so little of it, scientists have made very careful studies so it will not be wasted. They have learned exactly how much tin is needed to make a good tin can.



SOLDERED .... ONE END ATTACHED



You may be wondering why we cover a steel can with tin. Tin protects the steel. The acids and moisture in the food cannot rust tin.

If you should examine a can, you may not be able to tell where the tin is. But you can find out what the tin looks like by scraping some shavings from a can. Put the shavings in a glass of water. Let it stand overnight.

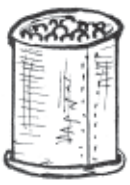
Now see what has happened to the tin. What happened to the steel? You can very easily tell which are the steel shavings and which are the tin. The steel shavings are the ones that rusted. Tin will not rust.

The can parts are cut from sheets of tin plate. Tin plate is a sheet of steel with a thin coating of tin. Machines stamp out these can parts very accurately.

Then the body of the can is formed. Examine a tin can. Do you see the seam up the side of the can? This seam is called a lock seam. It is soldered on the outside of the can. Air cannot get through it. The ends of the can are also made

LABELED AND

READY TO BE FILLED

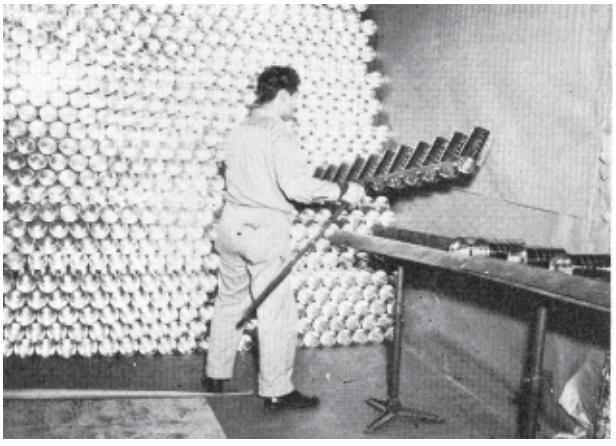


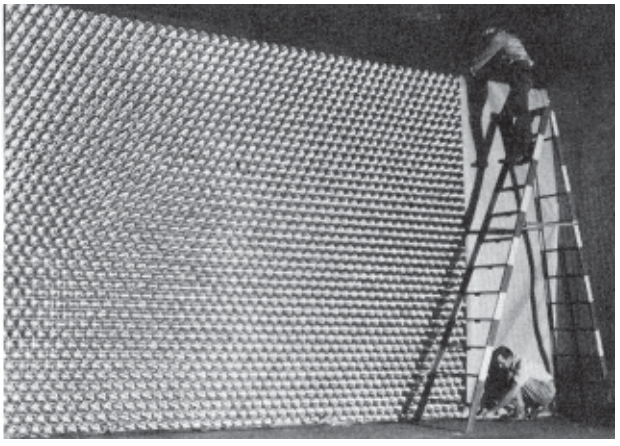
SEALED

so air cannot possibly leak through. The cans have the bottom ends only applied. The cans and the top ends of the cans are sent to the buyers. After the food has been put into the cans, special machines seal the tops on the cans.

You may have noticed that some cans are lined with gold-colored enamel. See if the can that you examined has this kind of lining. This is an enamel lining. This is used as a lining on some cans to keep certain foods from discoloring. Some enamels are used to make the can last longer when the foods contain acid. Enamel also helps in conserving tin.

Cans that are lined with enamel are made in the same way as other cans. The enamel is coated on the tin plate before it is pressed into cans. The plate is sent through a drying oven. Here the enamel is baked upon the tin plate.





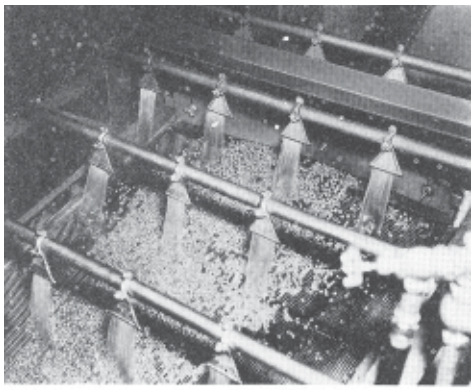
Cans are made very cheaply because so many of them can be made in a short time by machinery. We call this mass production. Mass production means making things in great numbers. The workers divide the jobs and each worker has a certain job to do. The cans move along the line of machinery. Each machine does its job and no more. The workers keep the machines in precise adjustment. Perhaps you can think of other things that are made by mass production.

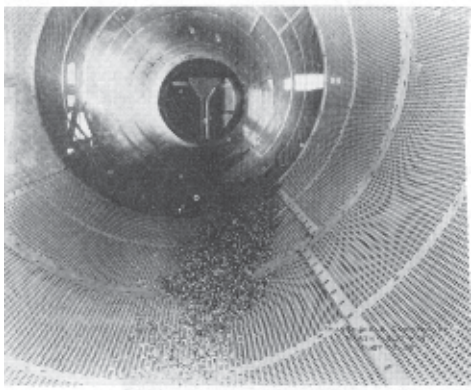
THE CAN, A COOKER

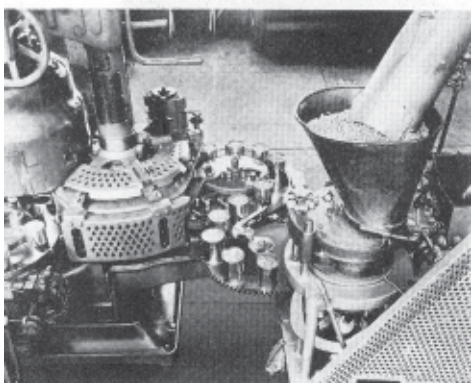
The modern can that you see in the picture is really a pressure cooker. After the food is put into it, it is sealed by machine. Then it is put into a closed kettle where the food is cooked under pressure. Fruits and vegetables are cooked in this way. Foods that are cooked in cans are safe because they are sterilized, and bacteria cannot get into them.

PROCESSING GREEN TREASURE

VISITING A CANNERY







Look at the pictures on this page. They show you how peas are canned in a cannery. First the peas are shelled. As they travel along a moving belt they are washed. Fine sprays of water wash the peas very clean.

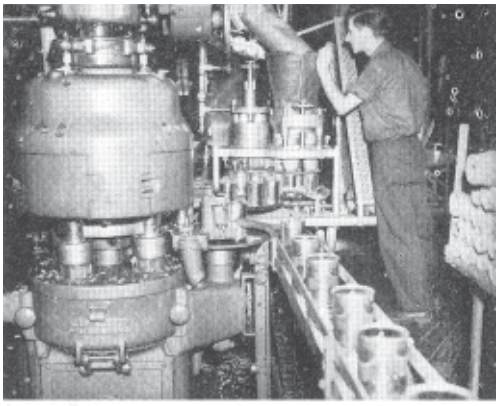
Then the peas are rolled over a metal screen. This sorts the peas. The holes in the screen are different sizes. Each size of pea drops through the screen at a different place.

The label on a can of peas will tell you the size of peas that are inside the can. Some people like large peas. Others like small peas.

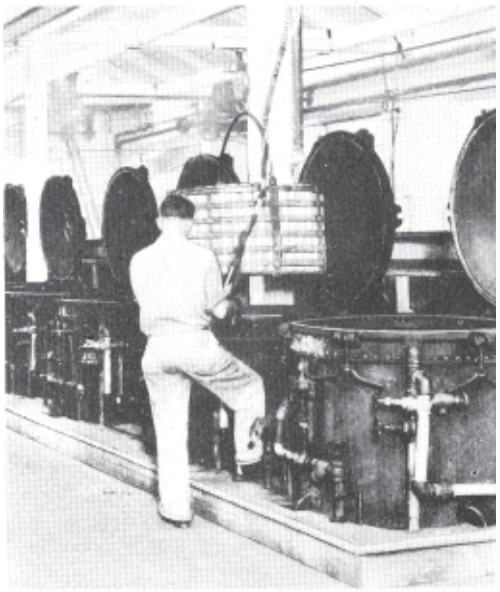
After the peas are sorted, they are sent through a bath of hot water and partly cooked. Then they are cooled with fresh clean water and placed in a filling machine. A can moves along until it reaches an opening at the

bottom of the filler. Then the right amount of peas is dropped into each can. A little salt, sugar, and water are added.

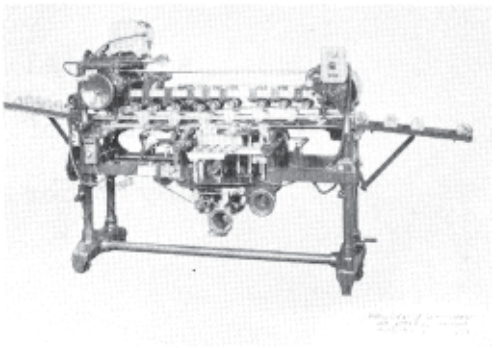
After the cans have been filled, the top is sealed on. Now the can is airtight. Bacteria cannot leak into cans that are sealed properly. The tops are put on each can very quickly by machine.



After the cans are sealed, they are put into big kettles to cook. Each of these big kettles will cook 6,070 number two cans at one time. In the five kettles that are shown in the picture, how many cans would that be?



After the peas are cooked, the cans are cooled and dried. Labels are glued on the cans. The machine which you see in the picture can put several hundred labels on cans in a minute. Labels are important because they tell us what is inside the can.



INSIDE A POULTRY PROCESSING PLANT

Cackle! Cackle! What a noise these chickens make as they poke their heads from wire cages. The truck seems filled with hundreds of cackling chickens. They are on their way to a processing plant.

Chickens are brought from farms to the processing plants when they are about eleven weeks old. Turkeys must be seven or eight months old.

The chickens and turkeys are usually taken by truck from the farm to the plant. They are weighed as soon as they arrive. Then they are taken to a large room where they are fed from one to three days. This feeding is necessary because the chickens lose weight as they travel. Another reason for giving them a special diet is to make their meat taste better.

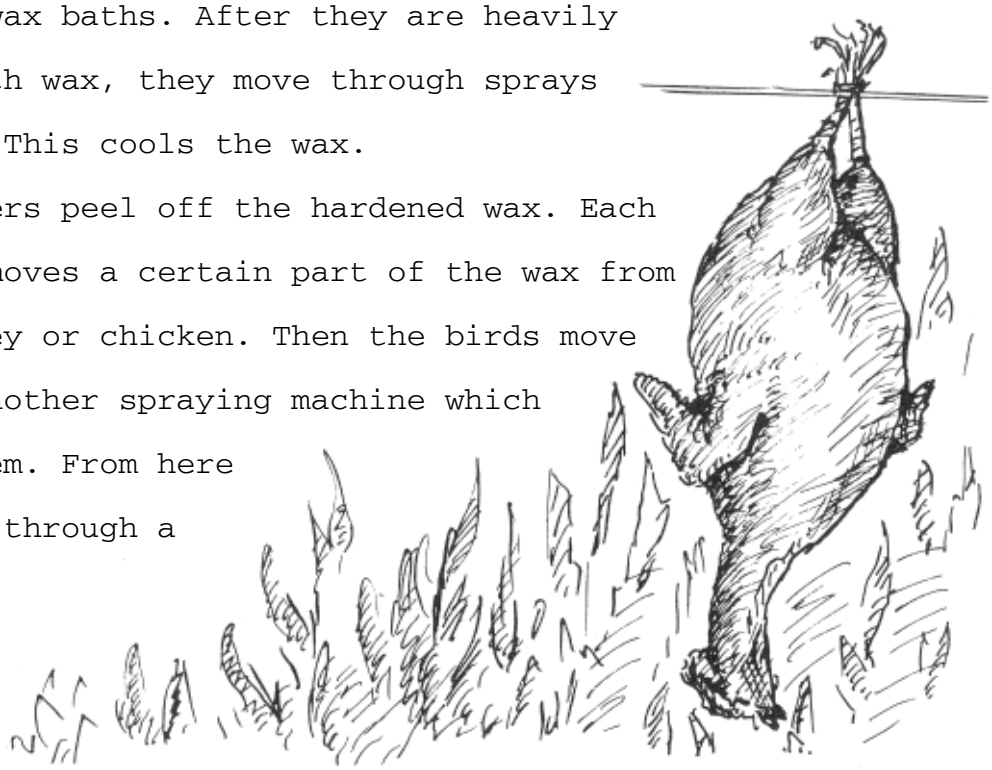
The food given to the chickens or turkeys is a special mixture of grains. It contains a large amount of water. This is the only way they get any water. They are fed about every forty minutes.

When the chickens or turkeys are ready to be killed, they are weighed again. This is to see if they have gained enough weight. If they are heavy enough for market they are hung by their feet and clamped to a slow moving belt.

They are killed by an electric knife. This happens so fast that they don't feel anything. Then they are scalded with hot water.

A machine takes off their feathers very easily. It does this by automatic fingers that pull the feathers off as the birds move slowly by. Some of the small feathers and the pin feathers do not come off, so they are dipped into two wax baths. After they are heavily coated with wax, they move through sprays of water. This cools the wax.

Workers peel off the hardened wax. Each worker removes a certain part of the wax from each turkey or chicken. Then the birds move through another spraying machine which washes them. From here they move through a gas flame.



The fire singes all the fine hairs that are left on the chickens or turkeys. Then they are washed again.

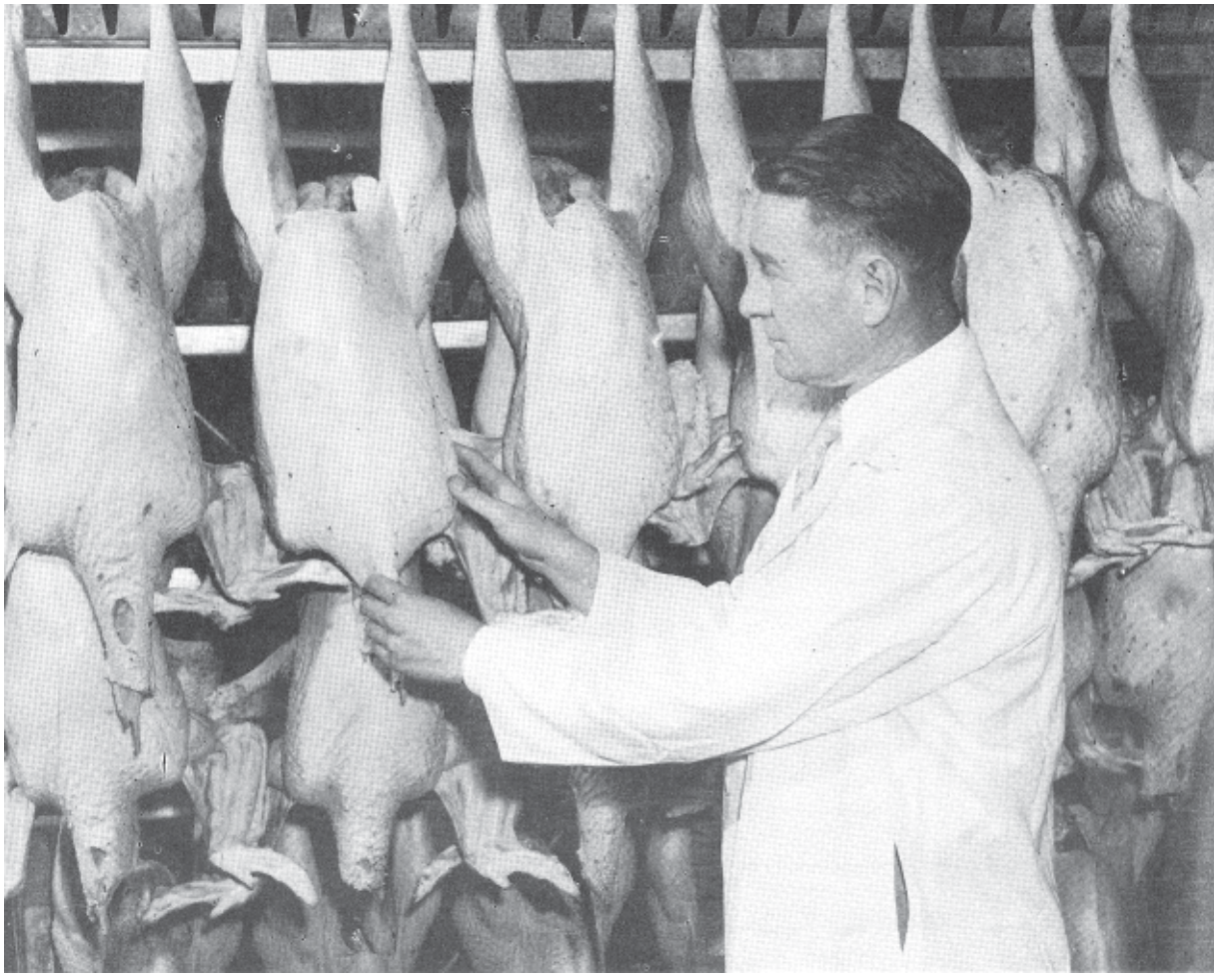
Only the hens are hung on racks to cool. The roosters are packed in iced tanks to cool. Ice that is packed around them cools the birds quickly. Some of the chickens and turkeys are then sent to market.

If the chickens are to be cut up, they are taken to another room. Here they are hung up again. Their hearts, lungs, and other organs are taken out. As they move along the belt, a government inspector looks at every bird. He can tell just by looking at the chickens or turkeys whether or not they were healthy.

The chickens are cut into pieces. They are put into cartons that are covered with cellophane. Then they are kept in a cool storeroom until they are sent to market. Some chickens are put in other cartons and quick-frozen. These chickens can be kept much longer than the others.

Turkeys are usually not cut up. After their organs are removed, they are put into a plastic bag. Then they are quick-frozen. They are kept in a very cool room until they are needed. We can buy frozen turkeys throughout the year.

The man in this picture is inspecting the turkeys. This is always done before they are sent to market. You may have seen the small tag that is put on the wing of a turkey. This tells you that it has been inspected.



INSIDE A MILK PLANT

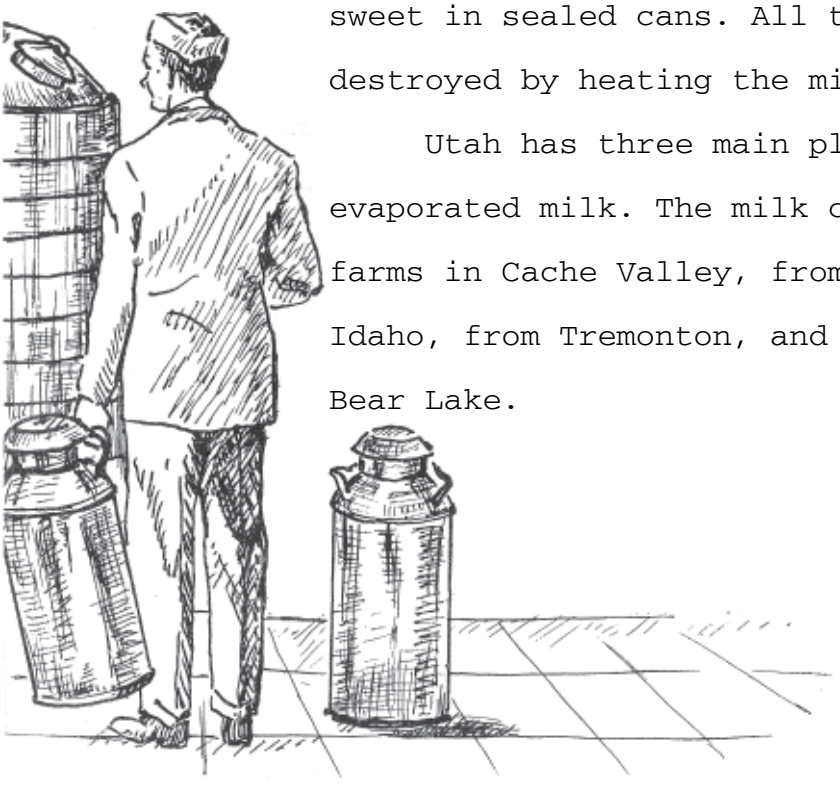
Milk is one of our most valuable foods. We drink it to keep strong and well. It must be kept clean and safe for us to use.

Our dairy farms in Utah supply us with milk to drink. There is also enough to make other products that we eat every day. Butter, cheese, and ice cream all come from milk. These products are made in plants called dairies.

When the milk was first put into cans and sealed, people knew only that they could keep it from turning sour by heating it and sealing it into the cans.

We know too that milk keeps nutritious and sweet in sealed cans. All the bacteria are destroyed by heating the milk in the cans.

Utah has three main plants that process evaporated milk. The milk comes from the dairy farms in Cache Valley, from nearby towns in Idaho, from Tremonton, and from farms around Bear Lake.



The milk is picked up from the dairy farmer each morning in ten-gallon cans. Then it is taken to a plant for processing. When it reaches the plant, it is tested. This is done to see whether the milk is clean, fresh, and sweet. If it is, it is weighed. A sample of the milk is taken to a room where the workers can find out how much butterfat is in it. The milk is heated. This kills harmful bacteria.

Evaporated milk means milk with the water taken out of it. When milk comes from the cow, it contains a great amount of water. Only one-eighth of it is actually solid food. The water is taken out of the milk by a special machine called an evaporator.

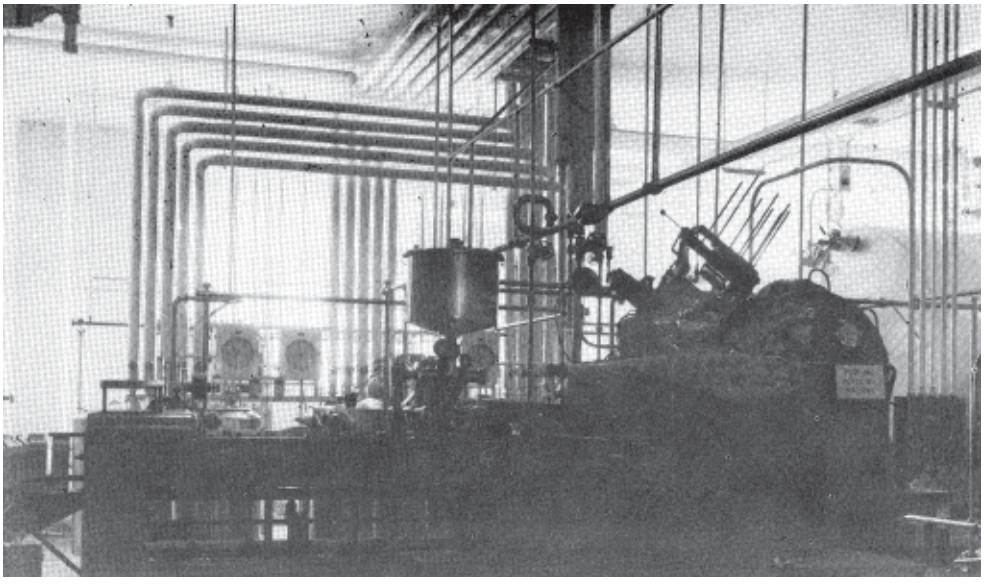
After the water is taken out of the milk, it goes through a homogenizer. This machine breaks the particles of fat found in the milk into very tiny pieces. When the fat is in such tiny pieces, it will not rise to the top. If you buy homogenized milk, you know that you cannot see the fat particles which we call cream.

After the milk leaves the homogenizer, it is cooled. Then it is pumped into tanks where vitamin D is added. This makes the milk more healthful for us to drink.

The picture below shows the inside of one of the rooms in a milk plant. Notice the tubes that carry the milk from one machine to another. The milk goes from tanks through tubes to another machine. Here it is put into cans. The sealing machine closes the filling hole on the top of the milk can and makes it airtight. Examine a can of milk to see where it has been sealed.

Then the cans move along to large sterilizers or boilers. Steam heats the milk inside the cans. Heat destroys any bacteria that might be in the milk.

Then the cans are cooled, dried, labeled, and packed. They are ready to be sent to market.



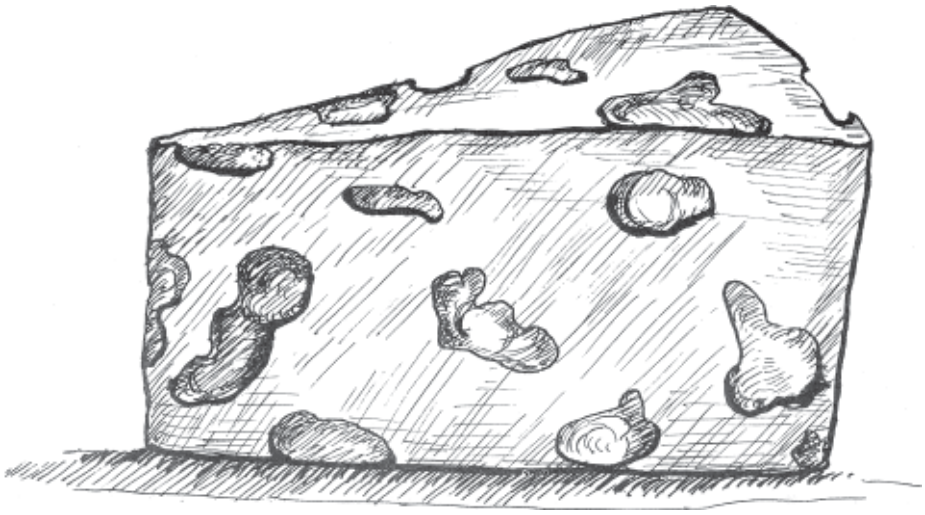
INSIDE A CHEESE PLANT

Swiss cheese is one of the dairy products made in Utah. You may not know that Utah has one of the largest Swiss cheese factories in the world. It is in Smithfield, Utah.

One hundred wheels of cheese are made each day. Each wheel weighs two hundred pounds. Swiss cheese is sent to markets all over our country from this factory.

Special kinds of bacteria are used in making the cheese. In fact the many holes or "eyes," as they are really called, are formed by bacteria that have been planted in the milk. This is done after the harmful bacteria in the milk have been killed. Do you know that the size of the "eye" determines how good the cheese is? The larger the eye, the better the cheese.

Other kinds of cheeses are also made in Utah. Cheddar, or American cheese, is made in several



cheese plants. Some of these factories make cheese only. Butter and other dairy products are made in other factories. Many pounds of butter are made in Utah every day.

WHAT WE LEARNED

Now you know some of the ways that are used to preserve and store GREEN TREASURES that are raised in Utah. You also know that tiny organisms like bacteria, and plants like yeasts and molds cause food to spoil. There are many ways to protect GREEN TREASURES from being spoiled by these tiny forms of life. Some of these ways, such as drying, have been used for many years. Other ways, such as quick-freezing, are new ways of protecting foods.

You have learned that some of the GREEN TREASURES we raise are prepared for markets in processing plants. They are located near farms where the foods they process are raised. These plants process the foods properly and put them in containers that keep them clean and safe for us to eat.

DISCOVERING NEW THINGS

1. Make cottage cheese in your classroom. To do this get some fresh, clean milk. Put it in a covered bowl and let it stand in a warm place until it sours. Then pour it into a pan and heat it. If you have a thermometer to use, heat the milk to a temperature of seventy or seventy-five degrees Fahrenheit. Keep the milk at this temperature until it forms a firm curd. Then put it into a clean cloth bag over a pan and let the watery part drip into the pan. The part that stays in the bag will be solid. This is cottage cheese.

2. Find out where the food products that are raised near you are taken to be prepared for market. Learn which ways are used to keep these foods safe to eat.

3. Visit a processing plant or a cannery near you. Tell another class about your trip.

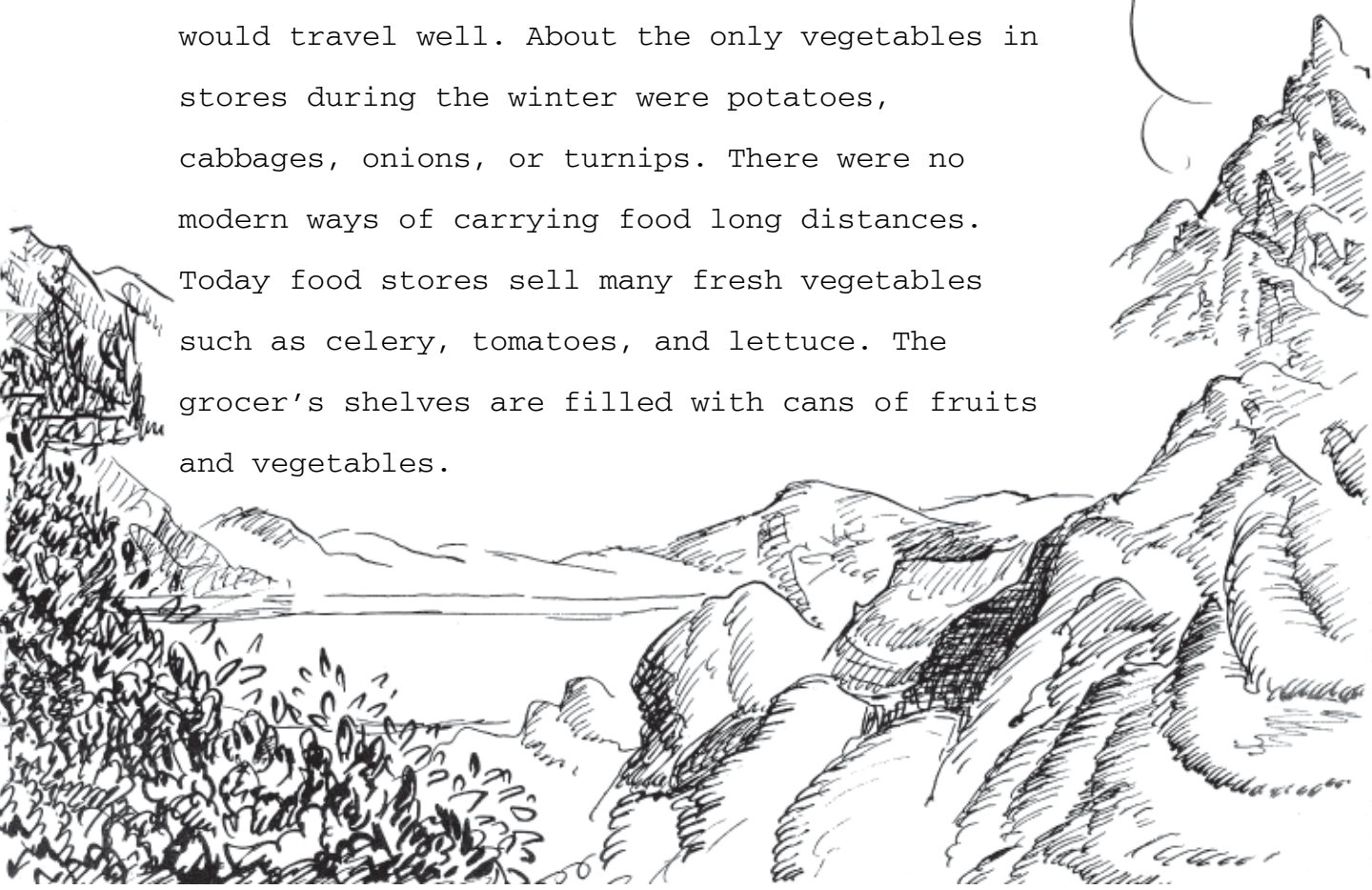
4. Make a movie showing how a certain food is processed. You might choose how butter is made, how a vegetable is canned, how meat is packed, or how sugar is refined.


MARKETING
GREEN
TREASURE

GREEN TREASURE – YESTERDAY – TODAY

Every day we eat GREEN TREASURES. Vegetables, fruits, meats, and milk products travel many, many miles from the farm to market. You may like to make a list of foods that you eat every day that come from some far away places. Can you find out how these foods reached the market where your mother buys them?

There was a time when farmers living in some parts of Utah could not send their food crops very far away. In those days the farmers didn't know how to pack GREEN TREASURES so they would travel well. About the only vegetables in stores during the winter were potatoes, cabbages, onions, or turnips. There were no modern ways of carrying food long distances. Today food stores sell many fresh vegetables such as celery, tomatoes, and lettuce. The grocer's shelves are filled with cans of fruits and vegetables.



Oranges were once a special treat. Now some stores have entire windows full of oranges, lemons, and grapefruit. The juice of these fruits is also found frozen in cans in the frozen food compartment of most stores. These foods can be found in the small towns in Utah as well as in the supermarkets in the cities.

Today we get all these foods in our grocery stores throughout the year. Some come from different parts of Utah. Then, of course, we get many from other states.

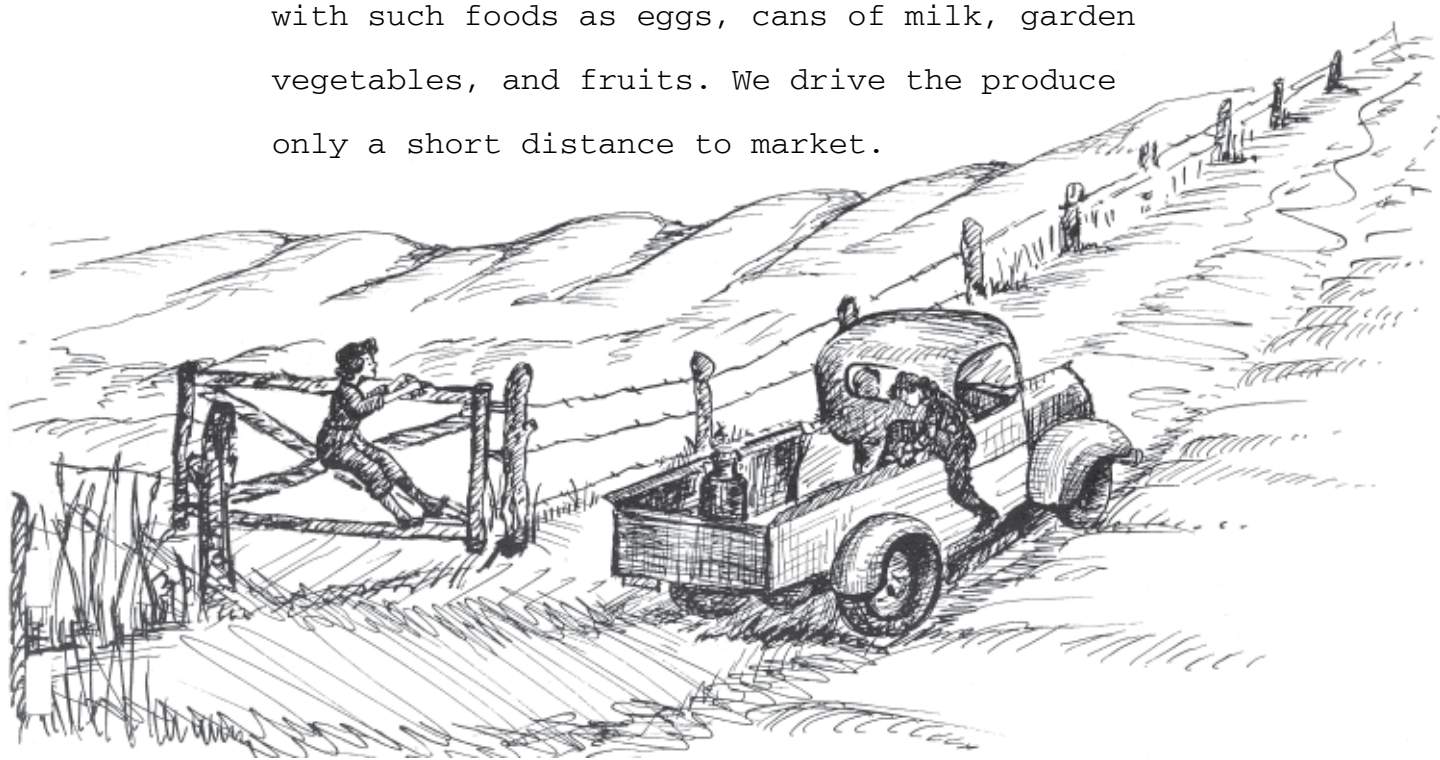
People in Utah find markets for their food crops in other states. Some of our GREEN TREASURES even travel to other countries. Foods raised in Utah travel to all of these other places by truck, train, or airplane. These different means of transportation carry food quickly and safely from the farm to market.

TRAVELING WITH GREEN TREASURE

Let’s suppose that we could take a trip with a load of GREEN TREASURES from the southern part of Utah to Salt Lake City.

A good time to take this trip is in early May. Along with many boxes of canned foods there are also such fresh vegetables as radishes, tender bunch carrots, and small green onions ready for market. Fresh foods are not ready to be marketed in the northern part of our state. The growing season in the southern part of our state starts earlier. So early fruits and vegetables are in demand.

Let’s start at a farm near St. George. We help the farmer load his small pickup truck with such foods as eggs, cans of milk, garden vegetables, and fruits. We drive the produce only a short distance to market.



When we arrive in St. George, we stop at a place where the farmers who live in this area unload their GREEN TREASURES. Here fresh vegetables are quickly loaded into a larger truck. This truck is already partly loaded with boxes of GREEN TREASURES packed in cans. Some of these boxes have traveled already long distances.

Let’s look at the inside of the truck while the men are loading the vegetables into it. How cool the air feels! The large compartments that hold ice keep the food cool. A fan circulates the air and keeps it moving around the food. Men that are loading the vegetables tell us that some trucks use dry ice to keep foods cool while others use plain ice. The men are going to put ice chips around the radishes and lettuce just before they close the door. This will keep these vegetables extra cool.

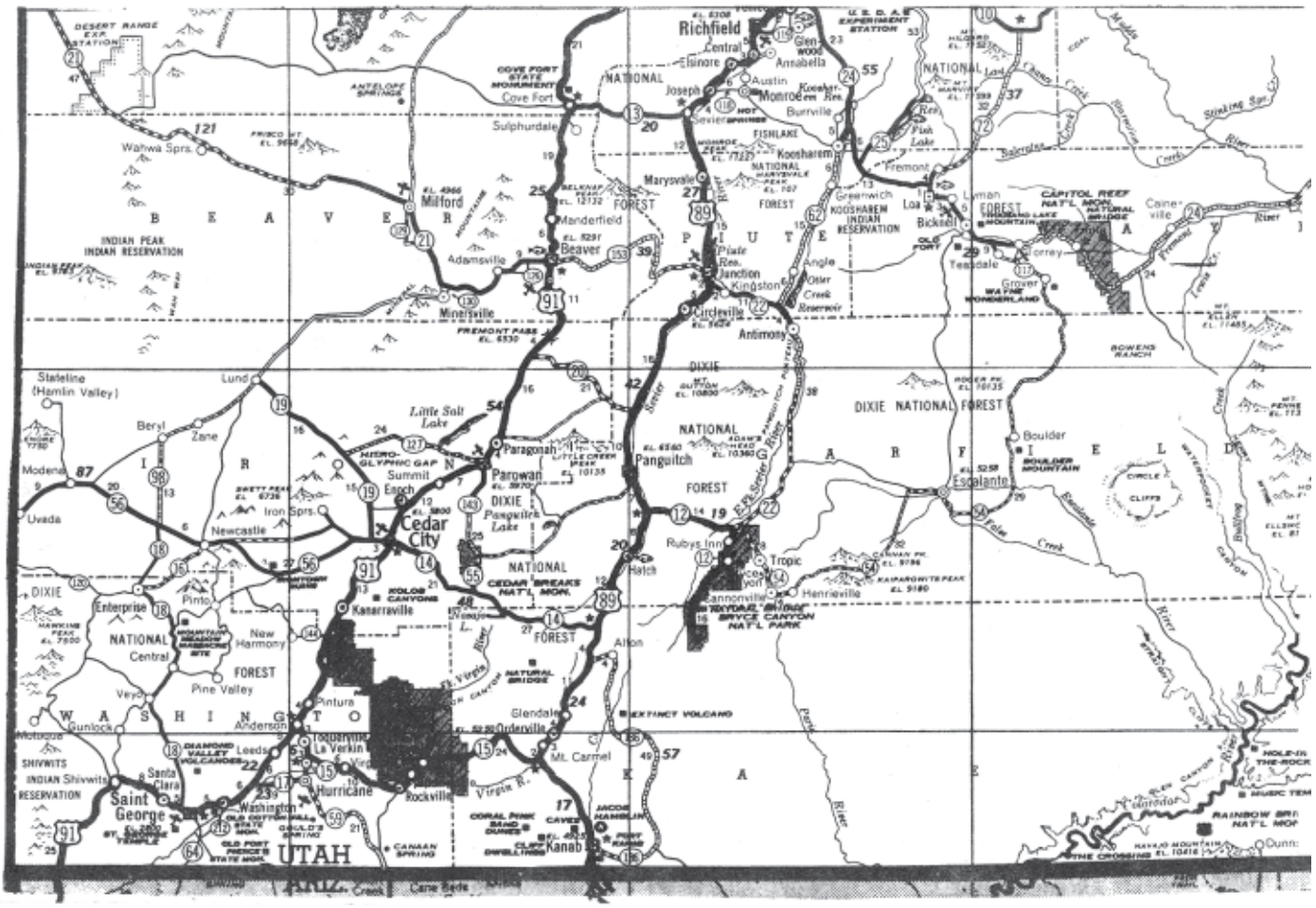
While the truck is being loaded, let's go over and talk with one of the truck drivers. There are two drivers. Each man drives for six to eight hour shifts through the night and day until they reach a certain truck terminal. The only stops they make are to pick up more boxes of GREEN TREASURE or to get something to eat at the stops where the trucks get their gas or oil.

The driver tells us that the bunk behind the seat in the cab is a place where one of them can sleep while the other one drives. We like the idea of a bed in the truck because we know that we might be sleepy before our trip is over. We are hoping that if we do, the driver will let us nap there.

ON OUR WAY

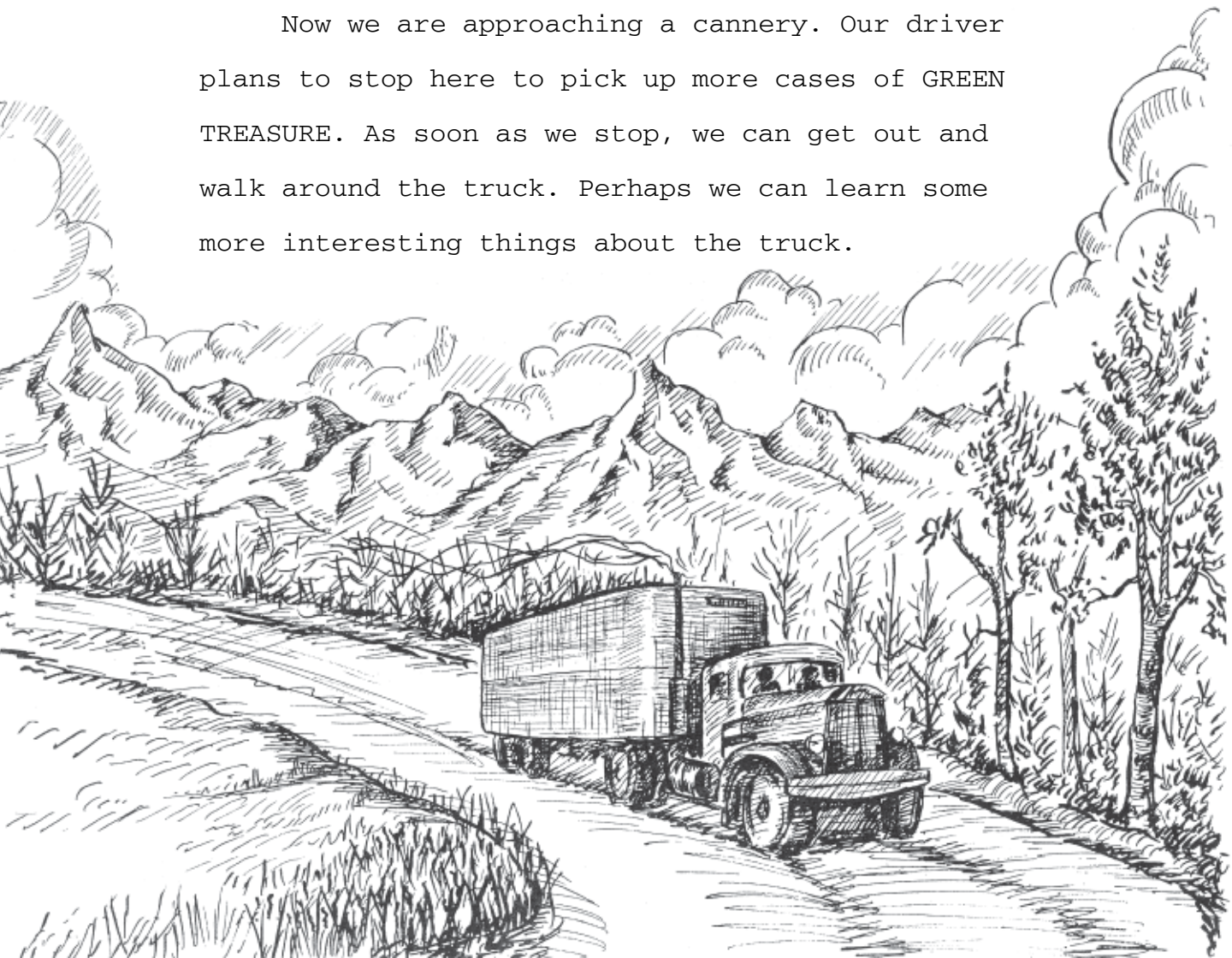
The truck is loaded and ready for us to continue on our trip. Let's look at our road map and follow the route as we travel. The map on this page looks much like the one that we are following.

Now that we are traveling along the main highway our truck is running very smoothly. The driver is very careful to signal properly. We see that he is signaling to the car behind us. He is telling the driver in the car that it is safe for him to pass us.



There are many other trucks that are traveling on this same highway. We notice that the truck in front of us has more than one license plate. Our driver tells us that all trucks must have a license plate for each state through which they travel. These trucks we see probably are also carrying GREEN TREASURES. GREEN TREASURES pass through many states on their way to market.

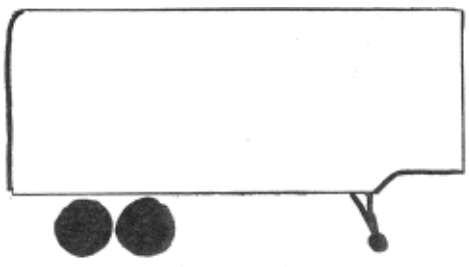
Now we are approaching a cannery. Our driver plans to stop here to pick up more cases of GREEN TREASURE. As soon as we stop, we can get out and walk around the truck. Perhaps we can learn some more interesting things about the truck.

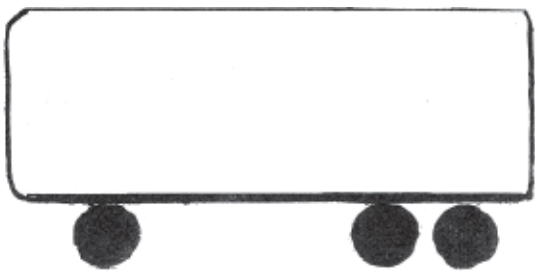


LEARNING ABOUT OUR TRUCK

One driver isn't busy at the moment so he explains some things to us. He tells us to look more closely at the truck we are traveling in. He says that it is not really a truck. It is made of two parts. One is a tractor, which is the pulling part. The other part is a trailer which carries the cargo. He also tells us that the drivers usually like to keep the same tractors. They just attach the tractor that they like to drive to the trailer that pulls the cargo they are to carry.

Now we are on our way again. As we travel along, our driver tells us to look very closely at the trucks that we pass on the highway. He tells us to look for two types of trailers. One kind is a full trailer that has tires and wheels under both ends. The other kind is a semi-trailer. It has two tires under the rear end but is supported by the tractor on the front. When we stop again, the driver draws us a sketch of



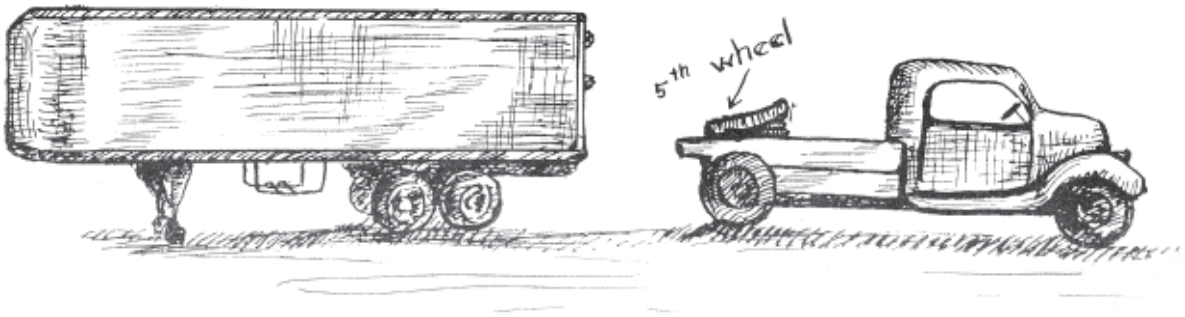


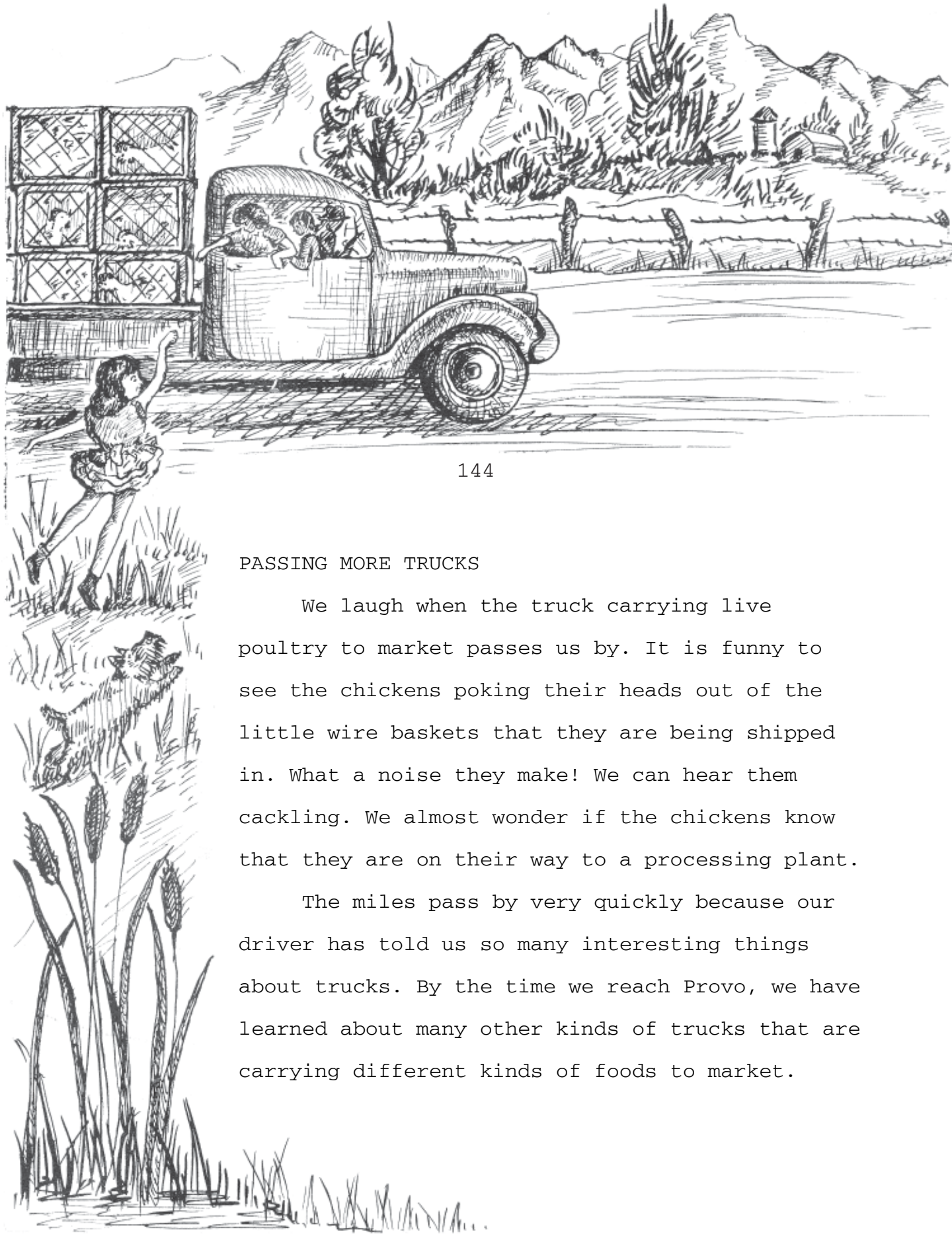
these. His sketch was much like the ones you see on this page. This helped us to see the difference between a trailer and a semi-trailer.

We wonder how a semi-trailer can stand alone when it is parked. The driver tells us that the two small wheels which hold the body up can be raised or lowered. These wheels are called dollies.

A fifth wheel joins the trailer and the tractor. Do you find it in the sketch below? It is a large metal plate on top of the tractor. It fits underneath the trailer and holds it tightly in place.

The truck in which we are riding is a semi-trailer. When we reach the truck terminal in Salt Lake City, the tractor will be taken away from the trailer. Then we can see just how the tractor is attached.





PASSING MORE TRUCKS

We laugh when the truck carrying live poultry to market passes us by. It is funny to see the chickens poking their heads out of the little wire baskets that they are being shipped in. What a noise they make! We can hear them cackling. We almost wonder if the chickens know that they are on their way to a processing plant.

The miles pass by very quickly because our driver has told us so many interesting things about trucks. By the time we reach Provo, we have learned about many other kinds of trucks that are carrying different kinds of foods to market.

After we leave Provo, we see many more cars and trucks on the highway. In fact, there are so many trucks that we think we shall just look for the ones that are carrying GREEN TREASURES. Let's see if we can tell what they are carrying.

There is a bread truck. It must be taking bread from a bakery in Salt Lake City to the stores in the little towns we have passed. The big yellow truck we are passing is an ice cream truck. There are more and more smaller trucks carrying food to market.

It will not be very long before we reach Salt Lake City. This is the main distribution center for most GREEN TREASURES that travel in and out of Utah. Farmers who live around Salt Lake City bring their GREEN TREASURES to markets so they can be sent to other places.

DISTRIBUTING GREEN TREASURE

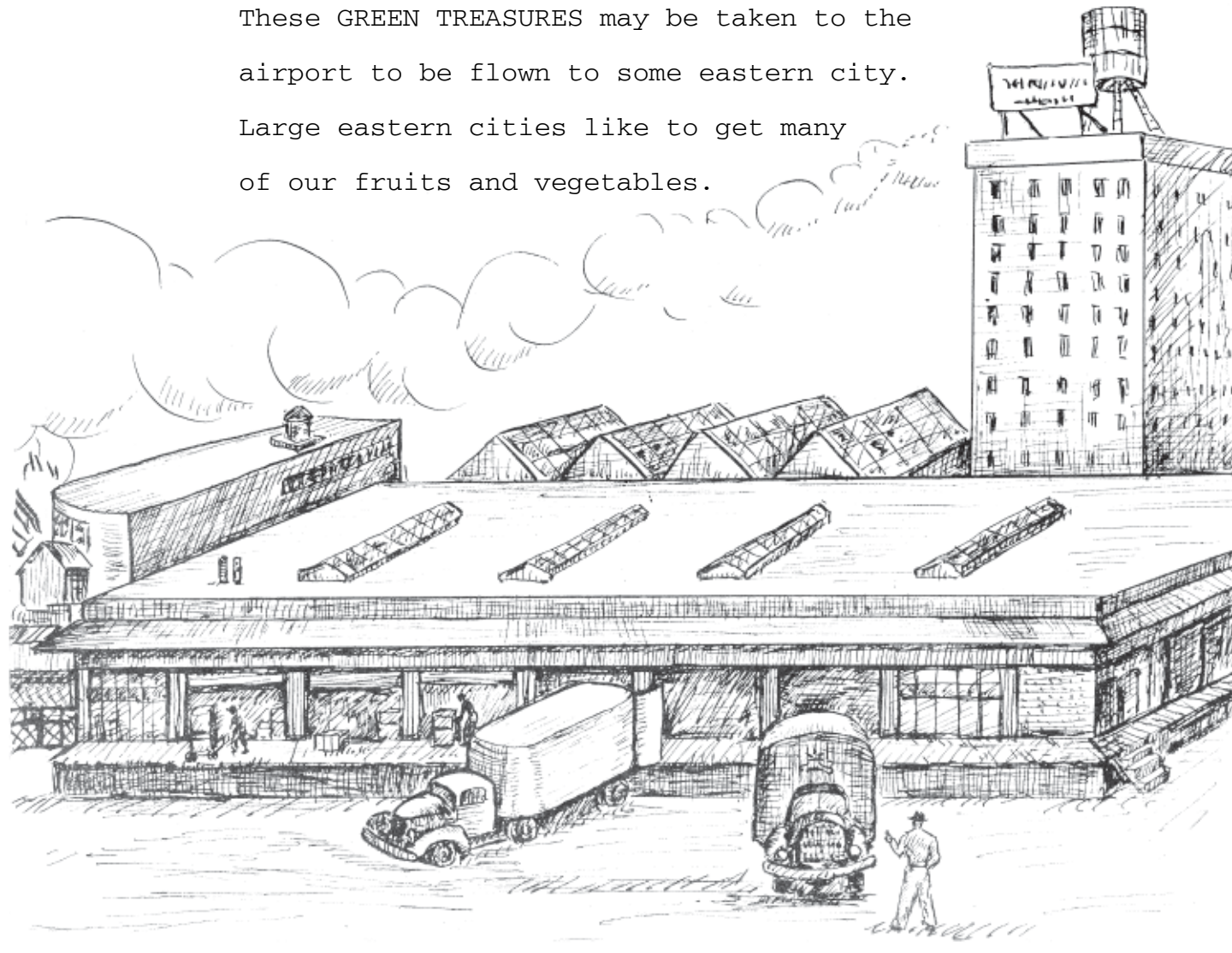
A TRUCK TERMINAL

As we drive into Salt Lake City, we look for the truck terminal. Here our driver will unload his truckload of GREEN TREASURES.

We are surprised to see so many trucks coming and going out of the truck terminal. Our driver backs up to one of the large loading docks. These long platforms extend from the main building. There are other trucks on both sides of us. We see many boxes of canned foods being loaded and unloaded. On one side of the platform a row of smaller trucks is being loaded with some GREEN TREASURES that the big trucks are bringing in. They will take these to markets and stores around the city.

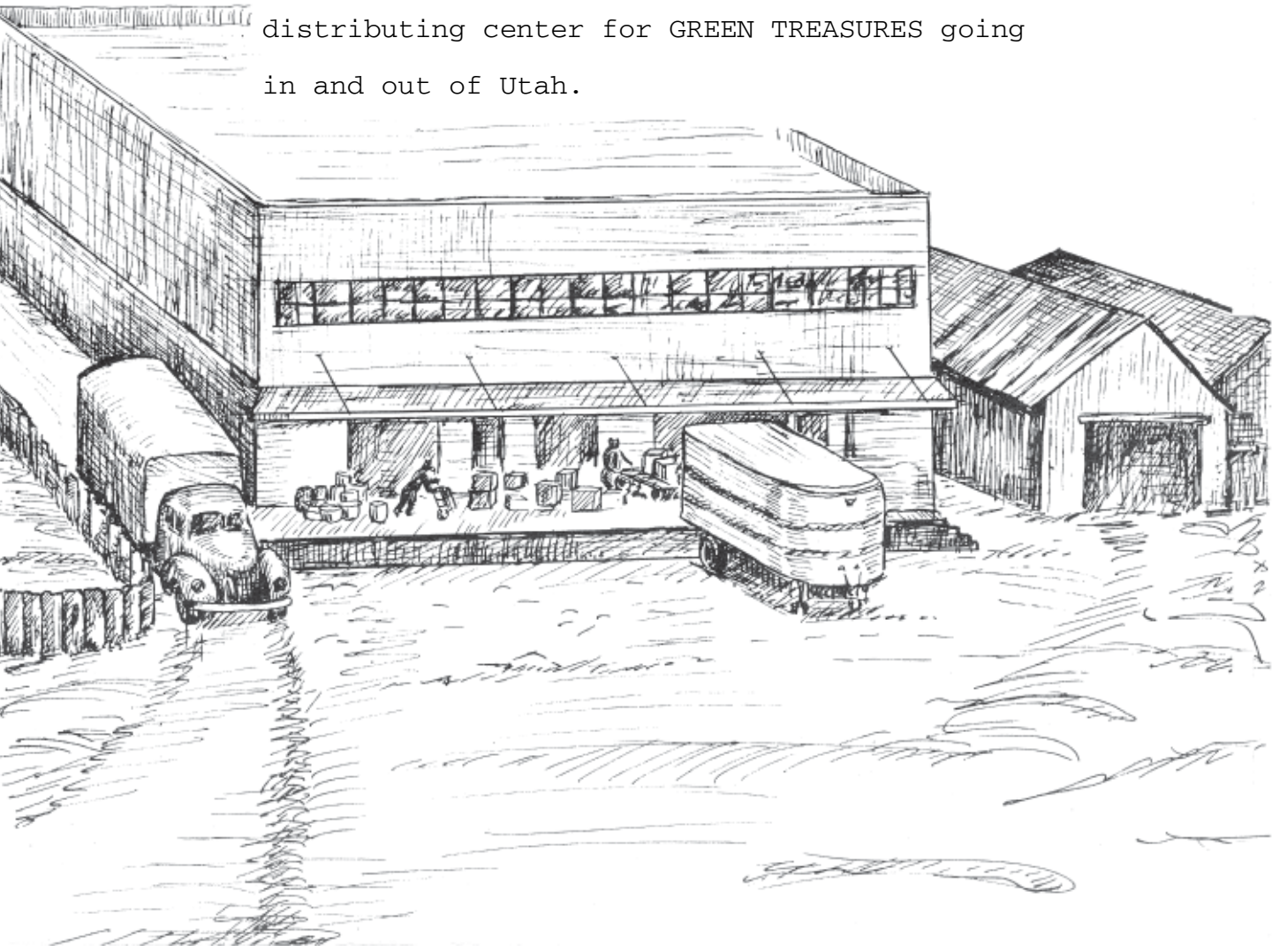
Let’s get out of the truck and watch the men release the tractor from the trailer. Remember that the driver told us that we could see the little dollies or wheels come down and hold the semi-trailer up. Now we can see the fifth wheel on the tractor.

Perhaps we can see where the GREEN TREASURES carried in our truck will be sent. They are taking some others to a pickup truck. These GREEN TREASURES may be taken to the airport to be flown to some eastern city. Large eastern cities like to get many of our fruits and vegetables.



They are unloading the vegetables so fast that it is hard for us to see where all of them are going. Some are going into other refrigerated trucks. These GREEN TREASURES will be sent out of the state. A small panel truck is driving away with boxes of canned foods.

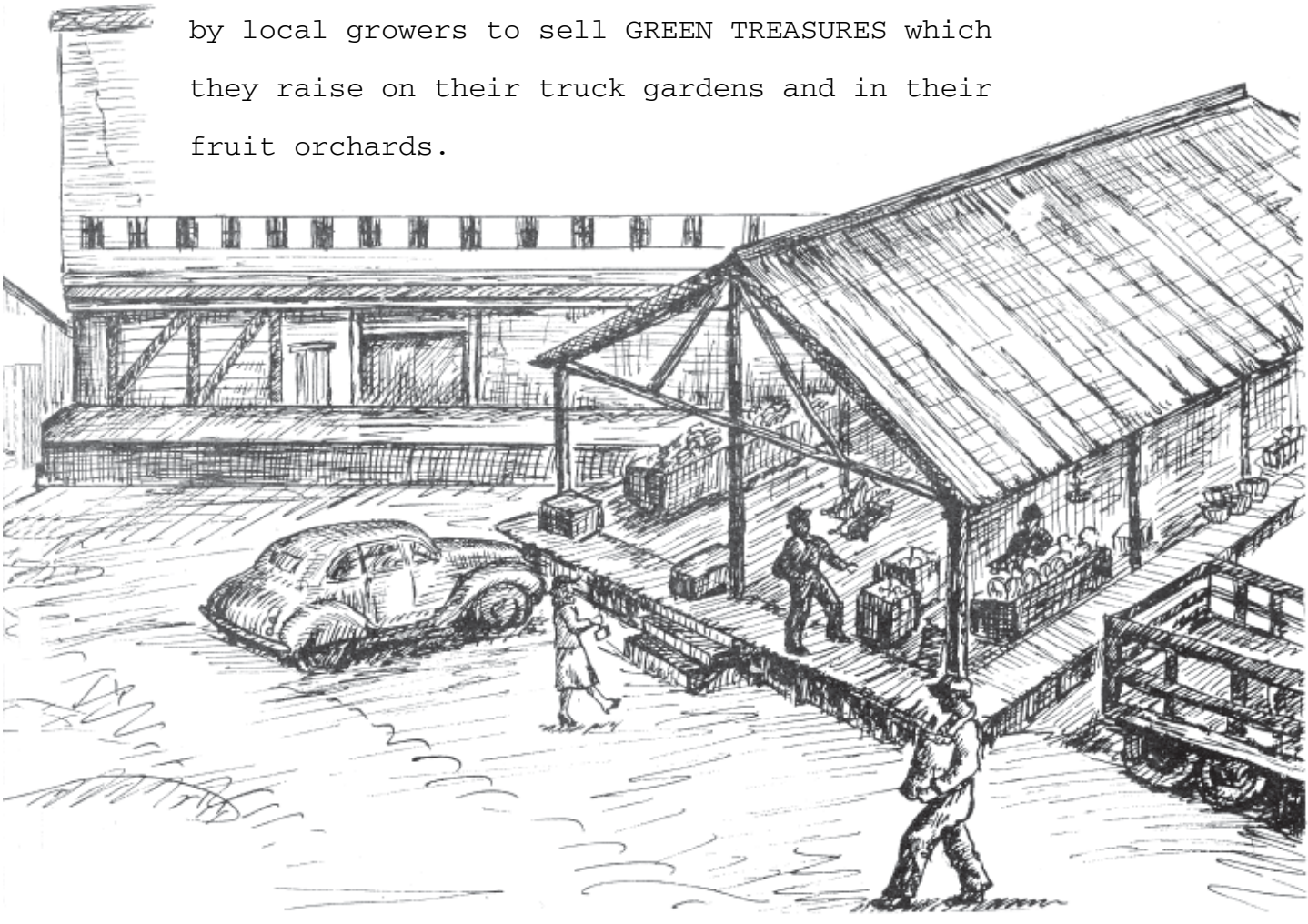
We hear one driver say that he is going to a wholesaler. Another driver is going to the Growers' Market. Now we know what our driver meant when he told us that Salt Lake City was a distributing center for GREEN TREASURES going in and out of Utah.



THE GROWERS' MARKET

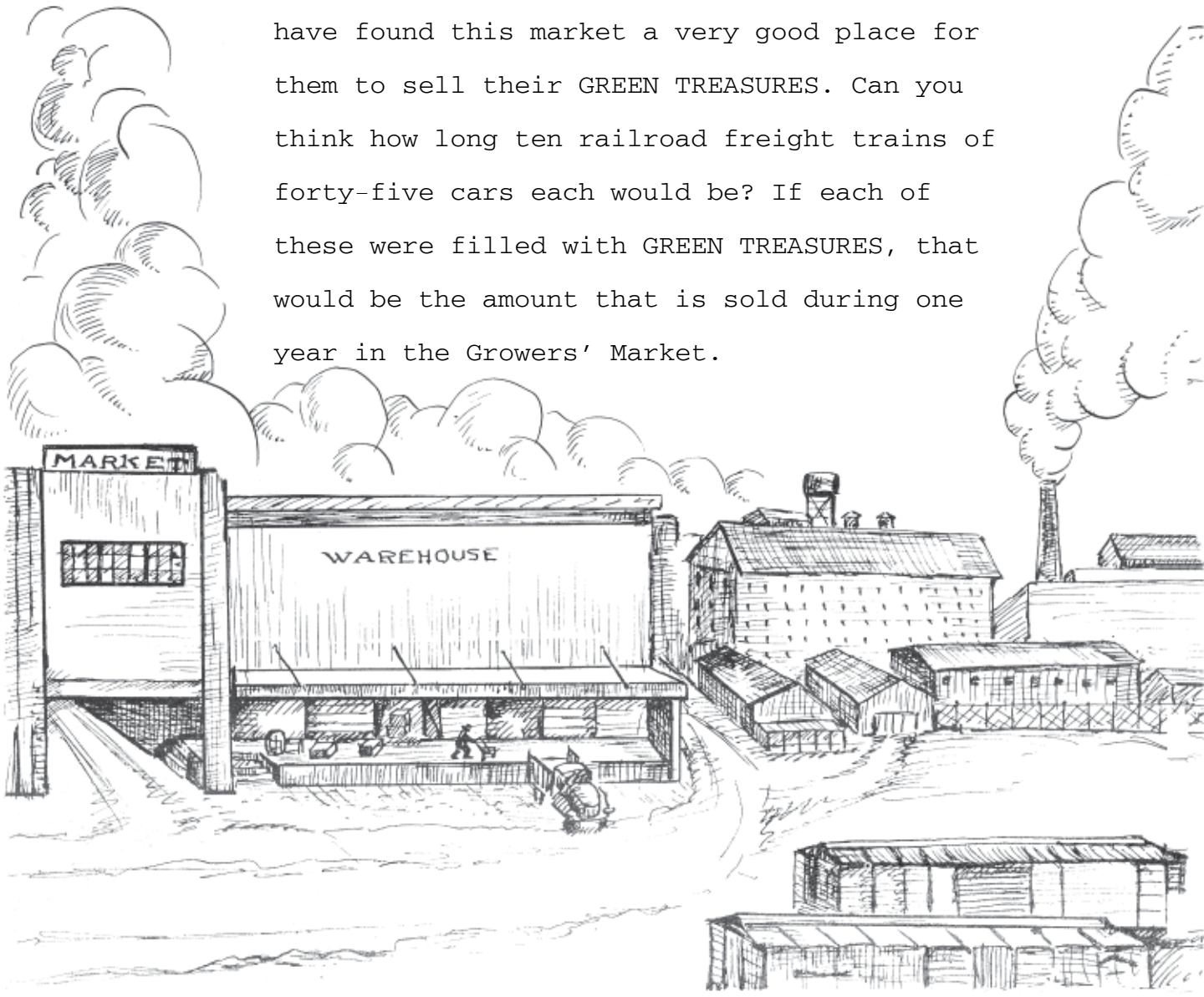
What a busy place this is! While the rest of the community is still sleeping, farmers and growers begin to arrive at the Growers' Market. Before six o'clock in the morning many trucks roll into the market. These trucks are well loaded with different kinds of GREEN TREASURES.

The Growers' Market is one of the largest markets in Salt Lake City. Down the center of the market area are two long loading platforms. These extend for a whole block. They are used by local growers to sell GREEN TREASURES which they raise on their truck gardens and in their fruit orchards.



On one side of these platforms are wholesale houses. Trucks from Nevada, Colorado, Wyoming, California, and Idaho bring food products from these places to sell. In turn, they take back canned foods and fresh vegetables that are available here and are needed in their states.

The growers in and around Salt Lake City have found this market a very good place for them to sell their GREEN TREASURES. Can you think how long ten railroad freight trains of forty-five cars each would be? If each of these were filled with GREEN TREASURES, that would be the amount that is sold during one year in the Growers' Market.



SHIPPING FRUIT AND CANNED VEGETABLES

Some fruits and vegetables leave Salt Lake City in a freight car. Freight cars come into Salt Lake on railroad tracks that run close to the wholesale houses. Here some are loaded with cans of GREEN TREASURES to take to other states.

Other cars have big letters that say REFRIGERATOR on them. These are carrying frozen or fresh fruits and vegetables.

The refrigerator freight car looks like the other box cars. But its floor, walls, and roof are thicker than those of the other freight cars. We might think of a refrigerator car as being much like a huge thermos bottle. It keeps out the cold or heat. It keeps the foods inside just the right temperature.

Ice is put into the refrigerator freight cars through openings in the roof called hatches. During the wintertime it is sometimes necessary to heat the cars so the food will not freeze. Then heaters are put in the compartments. There are little openings on the hatches that can be opened or closed to regulate the temperature.

The refrigerator cars that carry meat have steel bars on which meat hangs. Cool air moves around the meat to keep it from spoiling. Large pieces of meat are hung with hooks from the steel bars. The smaller pieces are wrapped and then put into boxes. Sometimes butter, eggs, or dressed poultry are shipped with the meat.

Some freight cars carry many boxes of canned foods. It is not necessary to keep these cool. They are carried in regular freight cars. They do not have to have any special care while they are traveling.

Railroad terminals are busy places. Here GREEN TREASURES are sent to all parts of the world.

SHIPPING LIVESTOCK

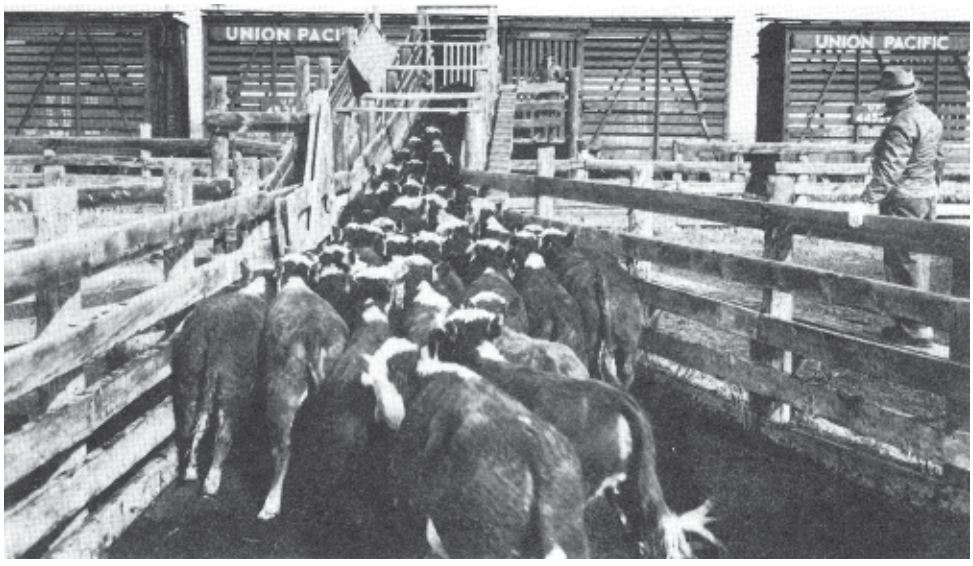
Some freight cars are built so they can carry live cattle, sheep, and hogs to the livestock markets. These cars look something like the other cars except the side walls. These are made of slats that are spaced two or three inches apart so the animals can get plenty of fresh air. Some of the cars that carry hogs and sheep have two stories so that more animals can be carried. The floors of livestock cars are covered with sand and straw so the animals will be more comfortable while they are traveling.

Most of the large cities have meat packing centers. Utah has two important centers. One is located at Ogden, Utah. The other is just outside of Salt Lake City.

At these centers there are stockyards which are made of acres and acres of stockpens. The livestock is kept here until it is time for it to be taken to the packing plants or shipped to other packing centers in other states.

Livestock cannot travel for too long a time without resting. The trains that carry them run on faster schedules than the other freight trains. If the journey is too long, the animals are unloaded on the way at resting pens. Then they are fed and given some water to drink. The animals are not started on their way until they have rested for at least five hours.

The cattle below are being loaded into a freight car. They have been fed and watered in the pens.

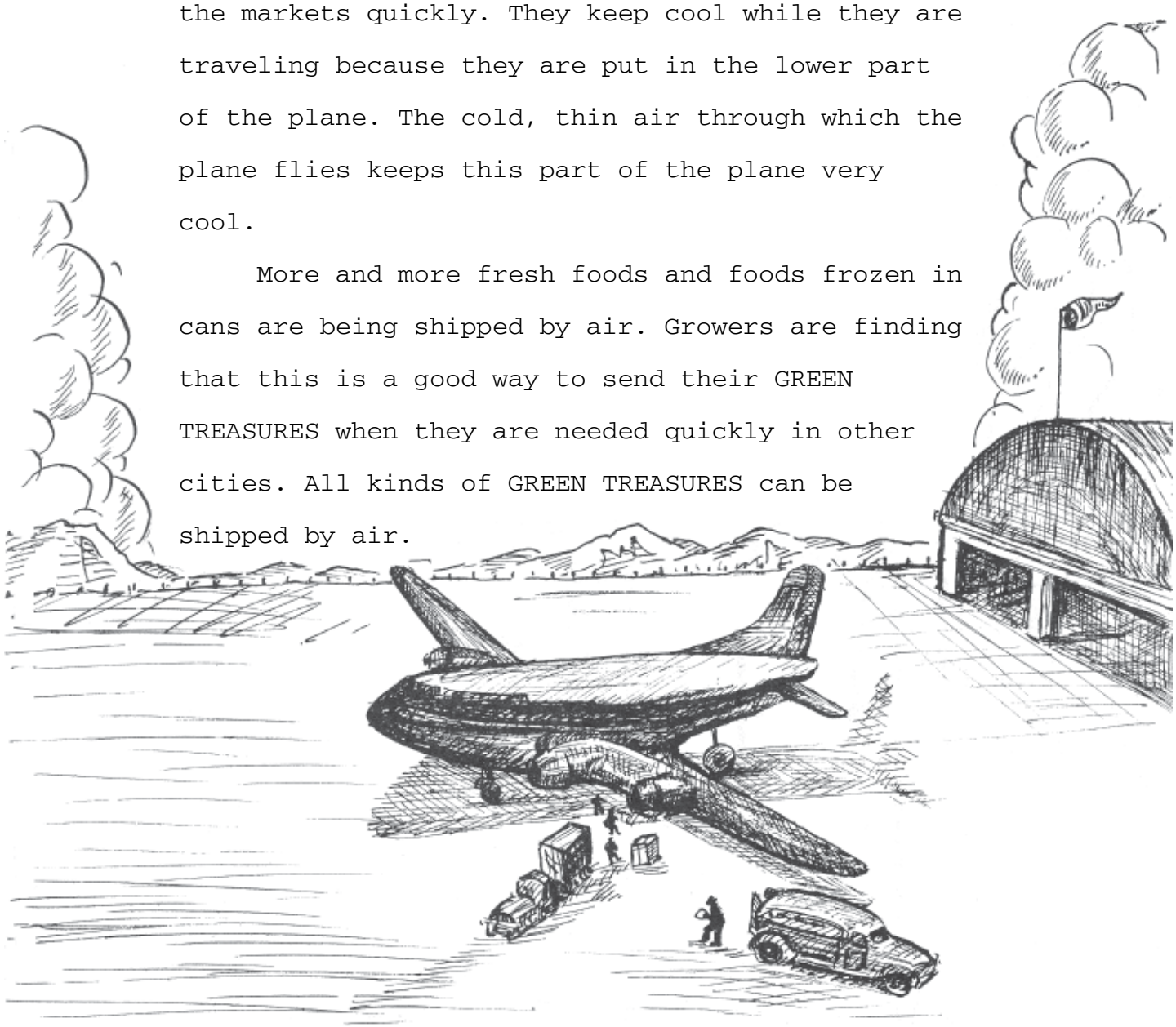


GREEN TREASURES TRAVEL BY AIR

Some GREEN TREASURES that come and go out of our state travel by air. From Utah, we send peaches, pears, tomatoes, celery, strawberries, and small shipments of other fruits and vegetables to markets where they are needed.

Foods travel well by air because they reach the markets quickly. They keep cool while they are traveling because they are put in the lower part of the plane. The cold, thin air through which the plane flies keeps this part of the plane very cool.

More and more fresh foods and foods frozen in cans are being shipped by air. Growers are finding that this is a good way to send their GREEN TREASURES when they are needed quickly in other cities. All kinds of GREEN TREASURES can be shipped by air.



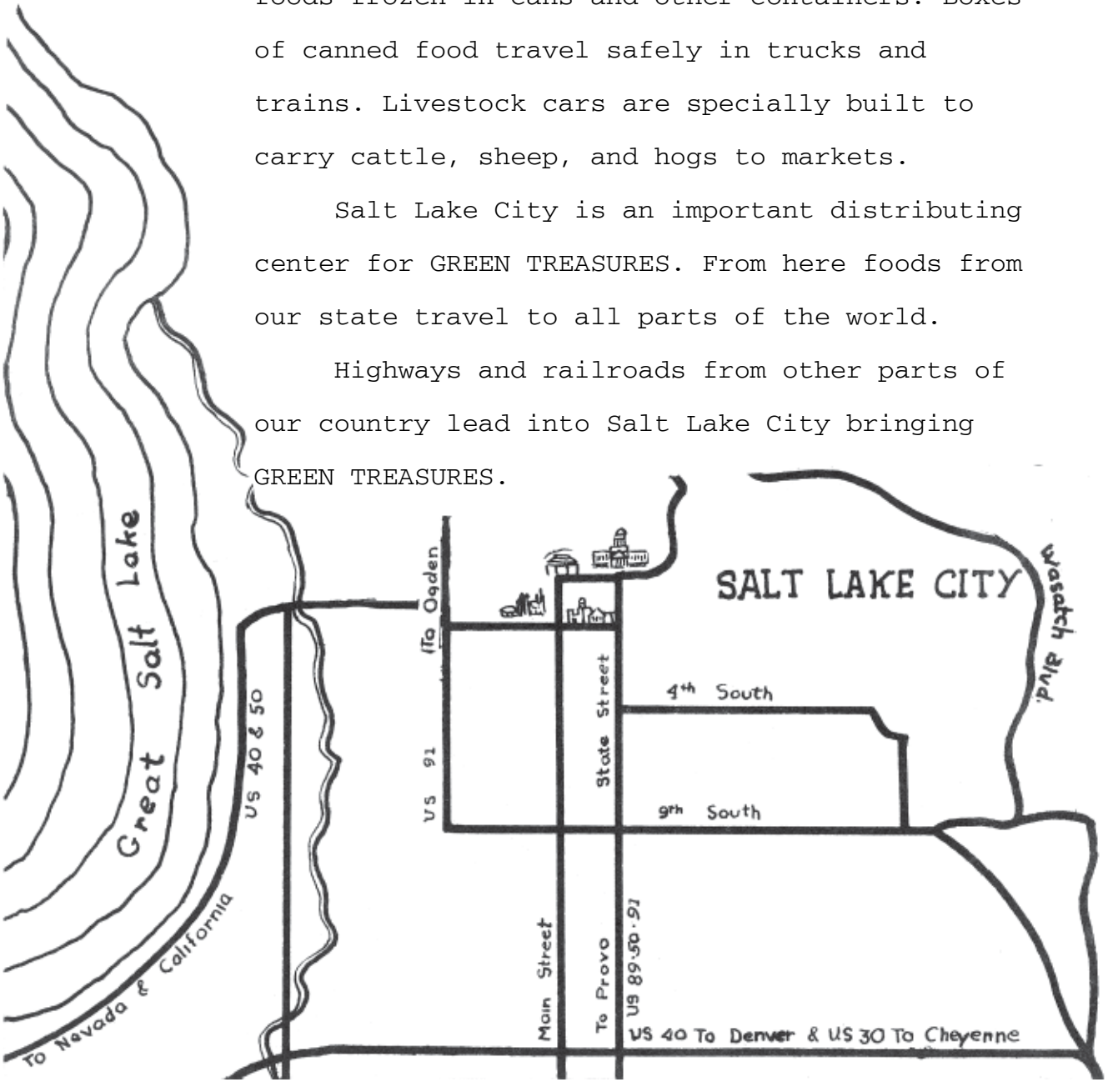
GREEN TREASURE TRAVELS EVERYWHERE

Trucks, trains, and planes make it possible for us to have a variety of GREEN TREASURES throughout the year.

Trucks and trains are built to carry all types of GREEN TREASURES. Refrigerator cars keep foods frozen in cans and other containers. Boxes of canned food travel safely in trucks and trains. Livestock cars are specially built to carry cattle, sheep, and hogs to markets.

Salt Lake City is an important distributing center for GREEN TREASURES. From here foods from our state travel to all parts of the world.

Highways and railroads from other parts of our country lead into Salt Lake City bringing GREEN TREASURES.



DISCOVERING NEW THINGS

1. Ask a truck driver to let you look inside his truck to see what special equipment the truck has for taking care of the GREEN TREASURES it carries.

2. Find out from your milkman how much milk he carries each day. How many stops does he make? Find out the same things about a bakery truck or a truck that delivers canned foods to the stores in your neighborhood.

3. Visit a wholesale market that distributes fruits and vegetables. Find out how they keep food from spoiling. Ask them where they buy and sell their GREEN TREASURES. If you do not live near a wholesale market, write a letter to one asking for this information.

4. Learn what food products are brought to your town by railroad or truck. Find out what GREEN TREASURES raised near you are shipped away by railroad or truck.