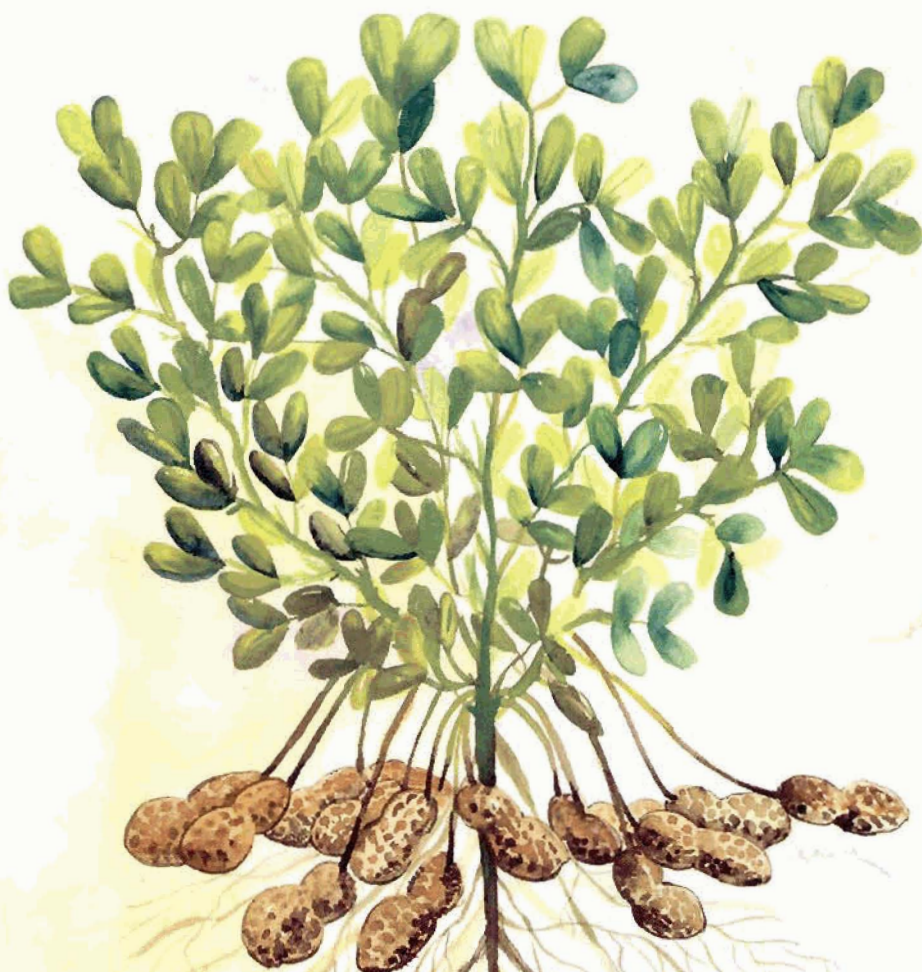


The Great American Peanut

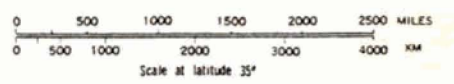
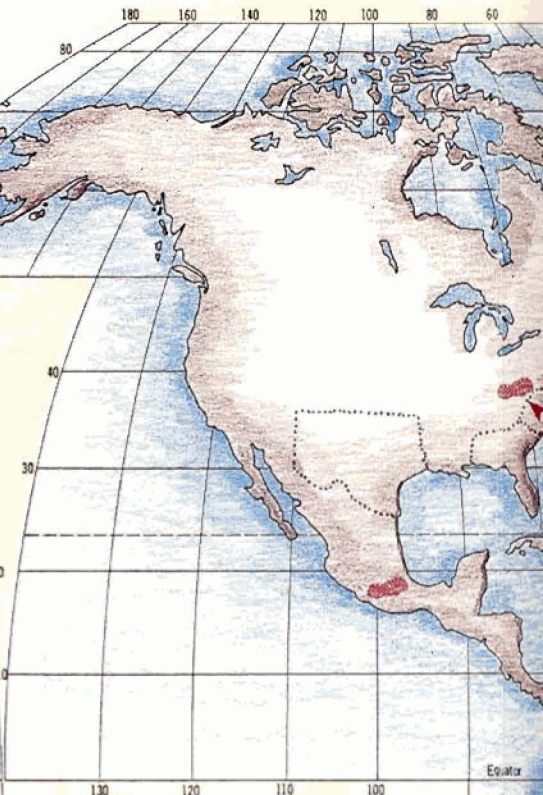
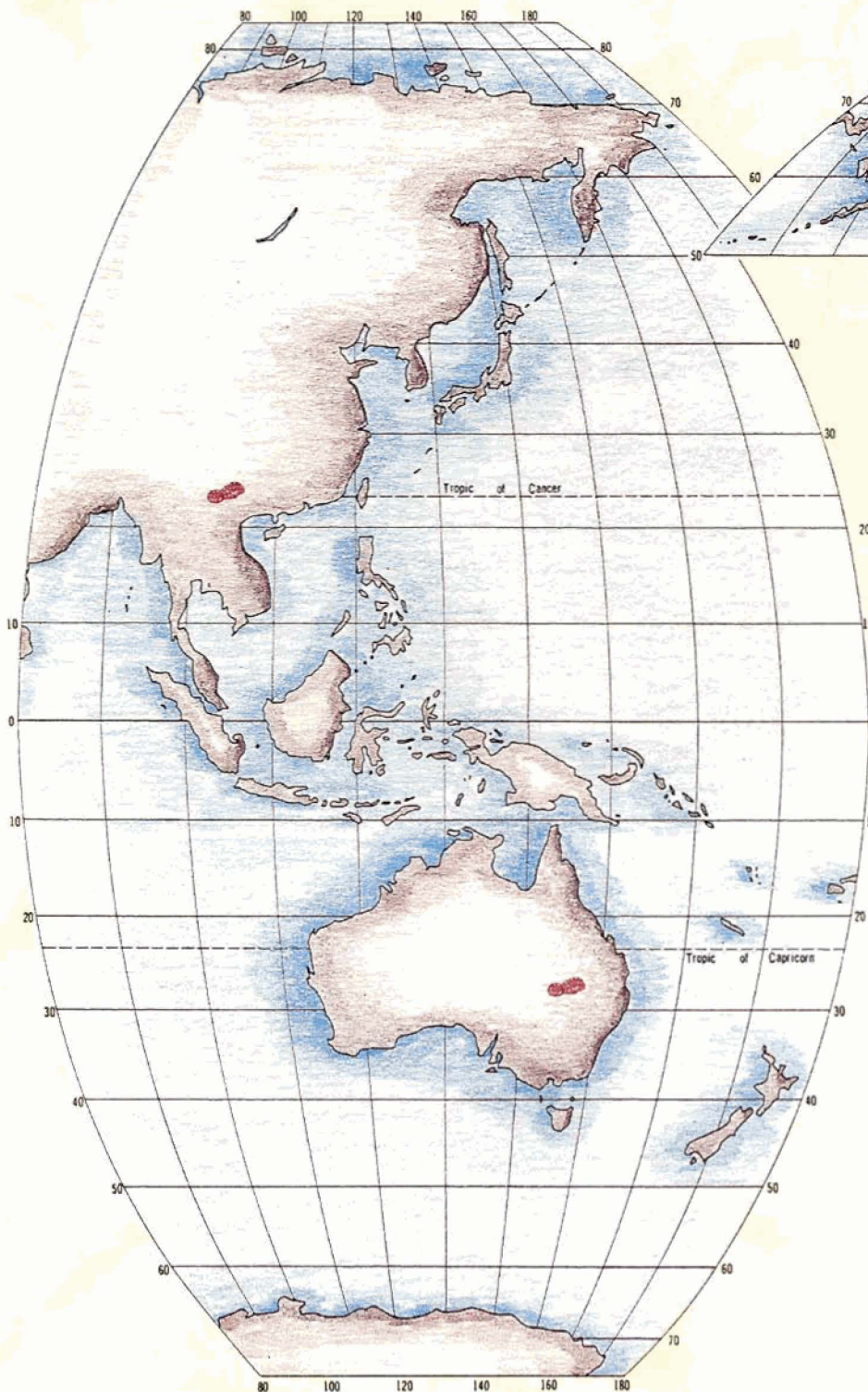
Marcia Eames-Sheavly

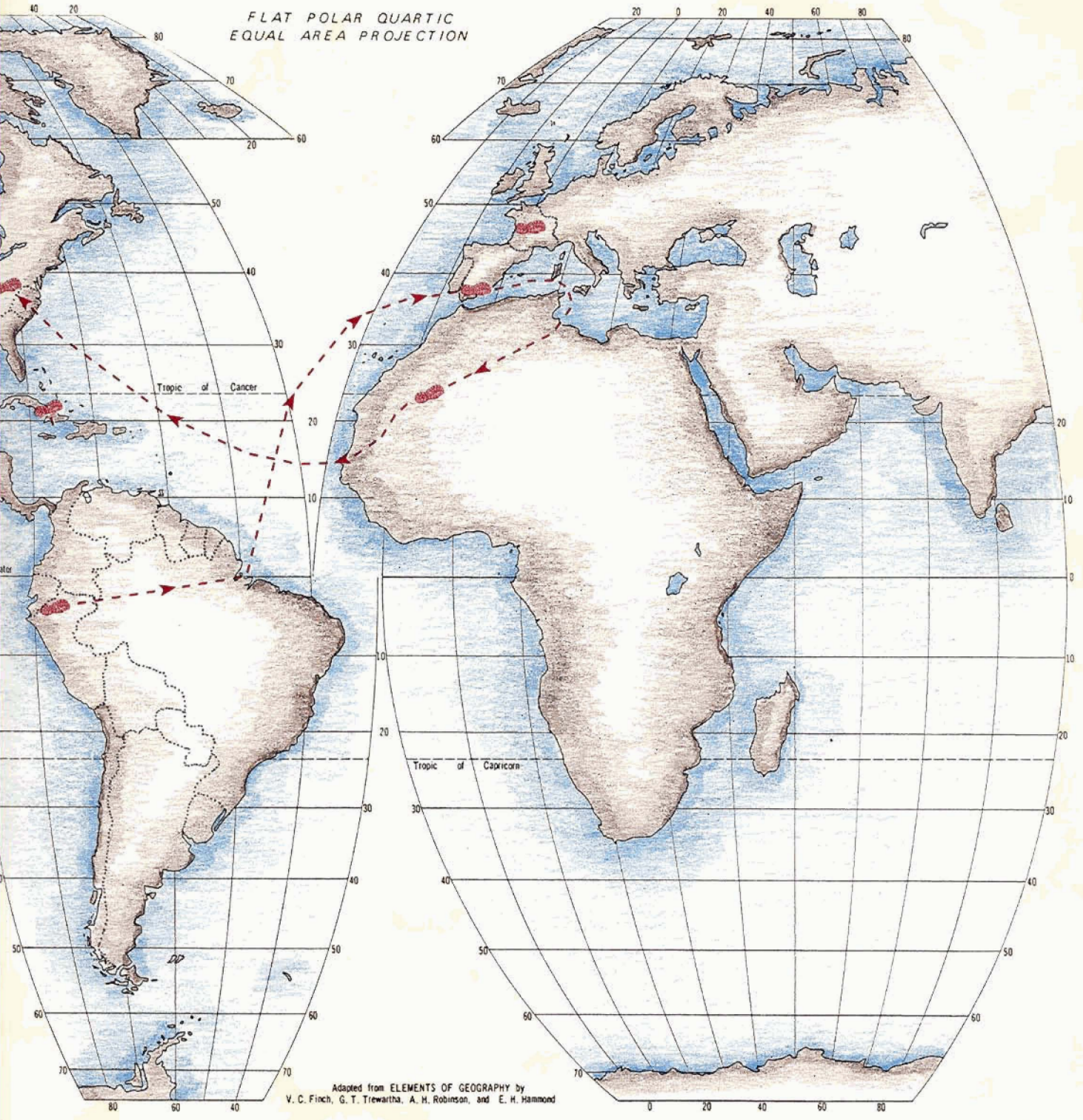


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4-H Leader's/Member's Guide 142LM16

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FLAT POLAR QUARTIC
EQUAL AREA PROJECTION

Adapted from ELEMENTS OF GEOGRAPHY by
V. C. Finch, G. T. Trewartha, A. H. Robinson, and E. H. Hammond

Can you find southwestern Brazil, Argentina, Paraguay, Peru, and Bolivia?
Native American people may have grown peanuts in all those places.

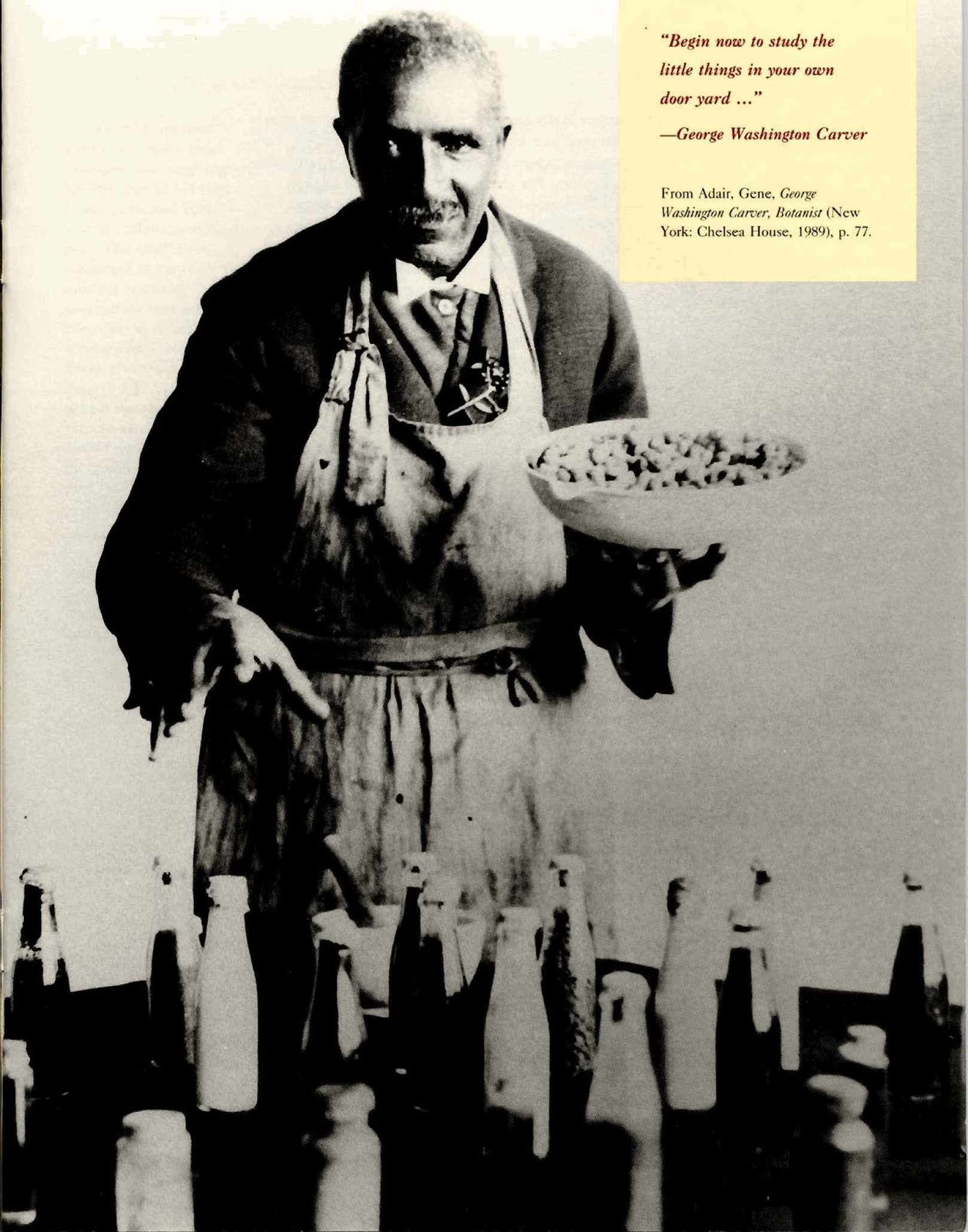
Outline map courtesy of Cartographic Centre, University of Waterloo, Ontario, Canada

Photo courtesy of Tuskegee University

*"Begin now to study the
little things in your own
door yard ..."*

—George Washington Carver

From Adair, Gene, *George
Washington Carver, Botanist* (New
York: Chelsea House, 1989), p. 77.



A Note to the Leader

You are about to set out on an exciting journey with our imaginary traveler Samuel Purvis to learn about an important world crop—the peanut. Seeing life in 1851 through the eyes of Samuel Purvis, you will sense his fears and hopes. While learning about how peanuts grow and the people who grew them, you will discover that the peanut traveled a long way before coming to this country. You also will learn about the challenges of growing warm-weather crops in northern climates.

This project is designed for a 4-H or other informal group. It can be used in a more structured setting, however, such as a classroom, where it would fit well into an interdisciplinary curriculum. For example, students could explore George Washington Carver's contributions in a social studies lesson, examine the botany of the peanut and follow the plant-oriented activities in a science class, and read the story of Samuel Purvis as a literature exercise.

Many of the activities and experiments are open-ended, allowing young people to interpret the material in their own way. Some youths will feel very comfortable with this approach, while others may need suggestions or encouragement.

For example, in the seed storage activity young people devise their own experiment but are given hints about variables to consider, such as temperature and moisture. You may need to help them think this through. (Where are there places in your home that have cold temperatures? Hot temperatures? Are some places more moist, or humid, than others?)

Another example is the peanut-growing exercise at the end of the project. Some young people may have many ideas for protecting the peanuts from frost, while others may need some hints.

Many activity materials are readily available for purchase, including plastics and row covers. There are numerous homemade options, too. Some young people may try to grow peanuts on black plastic, while others may attempt container gardening. Encourage their ingenuity in a brainstorming session to see what methods they come up with.

Some groups may choose to focus more on the sociocultural aspects of the project. If that is the case, you may want to check out materials from your library on slavery, the events leading up to the Civil War, the Underground Railroad, or the history of agriculture in the Andes or Africa as well as biographies of George Washington Carver or Harriet Tubman. There is so much to discover!

Finally, it is important to keep in mind that the main objective of *The Great American Peanut* is not to grow bushels of peanuts. That would likely be too discouraging for the participants. Rather, it is to explore an interesting crop and the people who have grown it and discover the challenges of growing peanuts in the northern United States.

The Voyage of Samuel Purvis

It was 1851. Samuel Purvis was cold, tired, cramped, and very hungry. During part of his long journey, he had been buried under straw on a cart. The chaff that scratched at his neck was a nagging reminder. Now he was curled into a box, bouncing in a hearse over a rutted back road through Pennsylvania on his way to New York. Samuel had heard that the North was an important place for antislavery activity. When he reached the end of his long trek, he would help others become free, too!

Samuel thought back to that night in Alabama when he decided that he would rather be dead than work any more as a slave on that dreadful plantation. He thought of how he'd planned his escape, the

long days of waiting, the thrill of escaping, the nights of slipping past towns, and the fear that came with rumors of slave catchers who had been spotted near where he had been hiding just two days before. He considered his own boldness and the courage of the thousands of others who were silently moving to where they could be free. To fight fear and loneliness, he thought of a song his mother had shared with her grandmother in Ghana.

Afe ko mayi do (Home must I go)

Aɔo dzinyelawo dome (To sojourn with my parents)

Hafi dzinye gbo na fa ee. (Before I can have comfort in my heart.)'

He thought of his long-dead mother and of the father he hadn't seen since



childhood. As he tried to straighten his back, hunger made him reach into his pocket. The groundnuts felt warm and dry there, but Samuel shook away the thought of eating them. He had come too far to eat the seeds he was carrying to plant at his new home—wherever that might be!



Ponder This

Suppose you were hungry like Samuel Purvis. Would you eat the groundnuts?

All about the Groundnut

You have read that Samuel Purvis carried groundnuts in his pocket. Today we call those nuts peanuts, although they are still referred to as groundnuts in other parts of the world. Scientists call peanuts *Arachis hypogaea* L. (uh-RAK-us high-po-GEE-uh). This name comes from the Latin words for “weed under the earth.” Soon you will discover why.

The peanut is a world traveler. Like the potato, it originated in South America more than 5,000 years ago. Researchers know that ancient Inca people honored the plant, because peanut designs have been found on early pottery, and peanuts themselves have been discovered buried

with Incas in sealed containers. In fact, some of those peanuts have survived into the twentieth century, perfectly intact after thousands of years!

Inca people called the peanut the *ynchic* (EEN-cheeh). Later, Quechua people referred to it as the *inchis* (EEN-chees). Two common names for peanut in the Spanish-speaking countries of South America were *cacahuate* and *mani*. The peanut is called *mani* in Spanish-speaking countries today. In other places it is called African nut, Chinese nut, Manila nut, kipper nut, hawk nut, jar nut, jur nut, earth chestnut, monkey nut, ground pea, and ground bean.² Now do

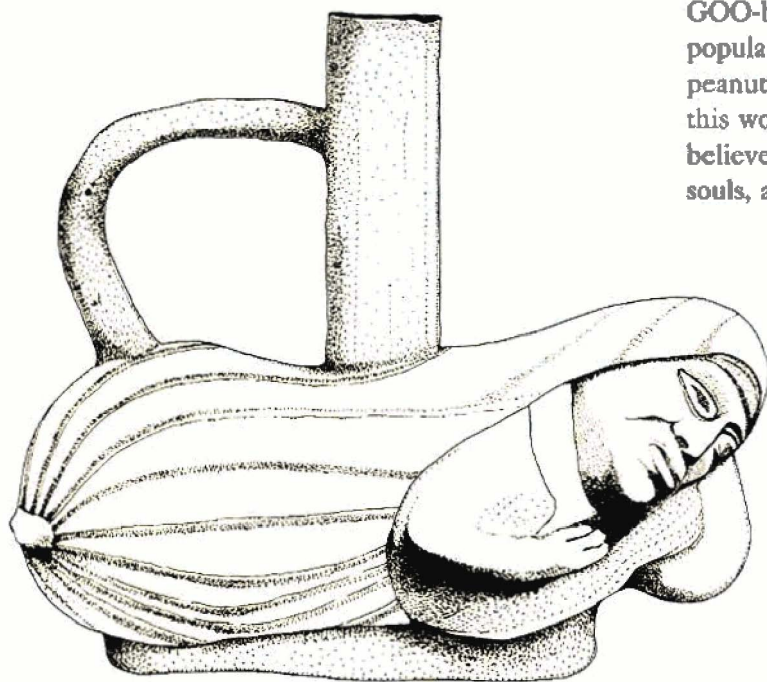
you know why people who study plants have agreed on one scientific name?

Sixteenth century Spanish conquistadors, while looking for gold in South America, came upon the peanut. Imagine them tasting a peanut for the first time. They were very interested in new crops unknown to Europeans, such as the peanut and potato. They brought the peanut back with them to Portugal and Spain. Although not a popular crop right away, peanuts soon were being traded for African spices.

When peanuts were transported from Europe to Africa, the people there enjoyed them greatly. They called them by the African Lingala word *nguba* (ung-GOO-bah). Goober, a popular name for the peanut today, comes from this word. West Africans believed that *ngubas* had souls, and they respected

them, perhaps similar to the way the Incas honored the *ynchic*. The plant flourished so well in Africa that soon some people believed that it was native to that continent.

So how did the peanut come to North America? We know from the work of people who explore ancient plant life that the peanut grew in Mexico and Central America long ago. If you look at the map on the inside front cover, you can see that this area of the Western Hemisphere is not far from the United States. Yet, the peanut is believed to have first come to our country in the slave ships from Africa. Peanuts stored well and were a good food to take on the long voyage across the Atlantic Ocean. They also were probably a comforting token of native culture for the captives who had been so cruelly removed from their homeland.

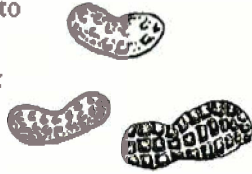


An ancient Peruvian ceramic in the shape of a peanut

Refer to the map on the inside front cover. Can you find southwestern Brazil, Argentina, Paraguay, Peru, and Bolivia? Native American people may have grown peanuts in all those places.

Activity: Store Seeds

Samuel Purvis is keeping the groundnuts in his pocket until he can plant them. In effect, he is storing them, just as farmers do until the time for planting is right. When people store seeds, they want to be sure to provide conditions that allow the seeds to stay alive. In addition to keeping seeds alive, they also want to be sure the seeds don't begin to sprout and grow before they are planted in soil.



Set up an experiment to find out for yourself the best conditions for seed storage. Think about light, moisture, and temperature. Find five different places in your home or classroom with very different levels of light, moisture, and temperature.

Place 1/2 cup of raw peanuts in each of those places. Check them each week to see if they sprout. Do you see any changes? Do you notice any differences based on where they are stored? Make a drawing to show what happens to the seeds in each place.

Based on your experiment, where is the best place in your home or classroom to store seeds?

Other Crops from the New World

What other foods came from the New World? The peanut is just one of many important contributions. You can thank Native Americans whenever you enjoy the tomato sauce on your pizza, the crispy crunch of potato chips, or a delicious corn enchilada! Tomatoes, potatoes, corn, pumpkins, blueberries, and peanuts are all native to this hemisphere.

Peanuts around the World

Many historians agree that the first planting of peanuts in the United States took place in Virginia at slave quarters near the edges of large plantations. The crops could have been planted by the slaves as an African tradition, linking them to distant, more pleasant times. European Americans did not take an instant liking to these so-called groundnuts. At first, they were raised primarily as feed for animals. It was many years before the peanut became a national favorite.

Just think of all the ways peanuts have made their way into our lives today. What would a circus or a baseball game be without peanuts? Although the expression "just peanuts" implies that something is trifling, peanuts have become important to both children and adults.

The acceptance of peanuts as a major crop plant came slowly. Before the development of the peanut oil industry, the world trade of peanuts was, well, ...just peanuts.

Can you find these countries, continents, and states on the map on the inside front cover?

★ France began crushing imported peanuts as an industry just 100 years ago.

★ Today, peanuts are raised commercially in

North America, South America, Asia, Africa, and Australia.

★ Farmers in Africa and Asia raise about 85 percent of the world's peanuts. Most are processed into peanut oil.

★ Commercial peanut production in the United States did not increase until after the Civil War. Labor-saving machinery for planting and harvesting was necessary for peanuts to become a money-making crop. Without these machines, the peanut would not have been widely grown.

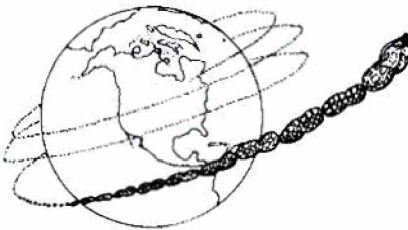
★ The three major peanut-growing areas in the United States are the Virginia-Carolina area, the Southeast (Georgia, Alabama, and Florida), and the Southwest (Texas, New Mexico, and Oklahoma).

In a short period of our history, we have gone nuts over peanuts. As a nation, we consume roughly 11 billion peanut butter sandwiches a year!

More than 2 million acres of peanuts are now grown. Nearly 5 billion pounds are raised by thousands of farmers in this country, and the world production of this crop exceeds 22,670,000 metric tons (1992 USDA Agricultural Statistics).

A Champion of the Peanut

To give you a better idea of how large the number 5 billion is, think about this: If you were to lay 5 billion, one-inch-long peanuts end to end, they would cover roughly 78,000 miles! That's around the world more than three times!



Five billion *pounds* of peanuts would make an even longer chain! You can make this calculation yourself. Purchase one pound of unshelled peanuts. Count the number of peanuts in a pound. Multiply this number by 78,000 miles. This is how far 5 billion pounds of one-inch-long peanuts, laid end to end, would go. Considering that the moon is 239,000 miles away, how many cycles would the peanut chain make to the moon?

Did you know that March is National Peanut Month?

Can you name a song with "peanuts" or "goobers" in it?

Just what is the "peanut gallery," anyway?

When do you ask, "Are you nuts?"

An important person in the history of the peanut was George Washington Carver. He helped people with ailing plants and taught young people to apply the rules of science to problems with farming. As director and instructor in scientific agriculture and dairy science at Tuskegee Institute in Alabama, this African-American professor became one of the greatest agricultural scientists of the early twentieth century.

While Carver was a young man, the chief crop of the South was cotton, which required a lot of work to grow and harvest. In earlier years this labor had been provided by slaves. In Carver's day mostly poor people worked the land for a share of the crop. These people were called sharecroppers. Cotton was grown so widely with the help of this cheap labor that it began to wear out the soil.



Before other crops such as the peanut were planted on a wider scale, "King Cotton" ruled the South.



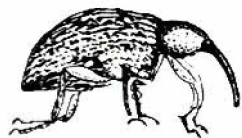
George Washington Carver

Adapted from a photograph of George Washington Carver in Johnson, F. Roy, *The Peanut Story* (Murfreesboro, N.C.: Johnson Publishing Co., 1964), p. 156.

Carver could see the unfavorable effects that growing cotton season after season was having on the land. He worried about the heavy fertilizer use that cotton required and the loss of valuable topsoil. Many farms were losing topsoil at alarming rates, and good topsoil was necessary for plant growth. He warned people about the dangers of one-crop systems, both for farmers earning a living and for the land.

The cotton boll weevil, a destructive insect that ruined cotton, threatened to destroy both the crops and the farmers' livelihoods. This chewing insect crept

from Mexico to Texas around 1904 and quickly to the rest of the South. Carver turned this potential disaster into an opportunity.



Boll weevil

Carver urged farmers to plant peanuts instead of cotton. Because peanuts were easy to grow and harvest and could survive the long dry periods common to the South, Carver saw the crop as a solution to the problems presented by the boll weevil and by repeated plantings of cotton.

As you will read in the coming pages, peanuts help add an important nutrient to the soil. With significant amounts of all three energy nutrients—protein, carbohydrates, and fat—they are a nutritious food for people as well. Carver's biggest challenge was to overcome the notion that peanuts were only a snack food, and he faced this challenge with delight.

Working with a home economics class, Carver examined the nutritional components of the peanut. Together they created a number of exciting new recipes, including soup, mock chicken, salad, bread, candy, cookies, ice cream, and coffee.³ He found that the peanut could even be

used in products such as margarine. He began to experiment with other ways to use the peanut and to invent new uses for the waste.

With many ideas in his mind, he thoroughly explored the uses of this plant in beverages, pickles, sauces, meal, instant and dry coffee, salve, bleach, tan remover, wood filler, washing powder, metal polish, paper, ink, plastics, shaving cream, rubbing oil, linoleum, shampoo, face cream, axle grease, synthetic rubber and more.⁴ When finished, Carver had come up with more than 300 uses for the peanut! Today, much of Carver's work on the peanut is on display at the Carver Museum at Tuskegee University in Alabama.

There is a monument in the town of Enterprise in Coffee County, Alabama, that acknowledges the opportunity created by the boll weevil's destruction of the cotton crop. It reads: "In profound appreciation of the boll weevil and what it has done. As the herald of prosperity, this monument was erected by the citizens of Enterprise, Coffee County, Alabama."

During Carver's lifetime this county was the most prosperous county in the state because of the peanut industry. By 1934 Coffee County held the world record for peanut production.

Ponder This

Why did the people put up a monument saying thank you to the boll weevil?

Why do you think George Washington Carver was so interested in peanuts?

Is there a use for peanuts not mentioned in Carver's long list of accomplishments? (Hint: You will find it in the last account of Samuel Purvis's travels on page 16. It is a recipe that Africans are credited with for bringing to this country. A similar food is also enjoyed in South America.)

Activity: Make a Peanut Advertisement

Imagine you are George Washington Carver. How would you go about finding new ways to use the peanut? How would you make the peanut so tempting that more people would want to grow and eat the peanut?

Design an advertisement to convince someone who has never tasted the peanut that it is delicious! Use colorful markers to grab their attention. What words would you use to describe it? Which of your favorite peanut foods would you mention?

Foods that Feature Peanuts

As George Washington Carver showed us, many delicious dishes can be created using the peanut. You have probably tasted peanut butter cookies, peanut candies, and peanut brittle, but the recipes below may be new. Try them to appreciate the peanut fully!

Always use fresh peanuts, and throw away any that are moldy or discolored. Store peanuts in the refrigerator. If you plan on keeping them for more than three months, you should store them in the freezer. You can find fresh peanuts in the bulk food section of many grocery stores. Or, grow your own!



★ Homemade Peanut Butter ★


Makes about 2 cups

Preparation time: 20 minutes

Fresh peanut butter is different from store-bought peanut butters, which contain sugar, salt, and hydrogenated vegetable oil (which keeps the peanut butter from separating). Try making your own and compare it to purchased products.

- 1 pound unsalted, blanched, roasted peanuts
- 2 tablespoons peanut oil (or more for a creamier butter)
- salt to taste
- optional: 1 to 2 teaspoons sugar

Put the peanuts in a blender or food processor with the peanut oil and a little salt to taste. Blend at low speed until the nuts are coarsely ground. As the nuts become more finely ground, increase the speed until the butter reaches the smoothness that you want. Add more oil for a creamier product. Store in the refrigerator for up to two weeks. Do not be alarmed when the oil separates; this is normal! Simply stir up the peanut butter before using it, or store it upside down.

Use this peanut butter in the following recipes. 



★ West African Peanut Stew ★

Serves 4

Preparation time: 40 minutes

Cooking time: 10 to 15 minutes

- 3 tablespoons peanut oil
- 2 medium onions, chopped finely
- 4 cloves of garlic, chopped finely or pressed
- 1 head of cauliflower, cut into pieces
- 1 cup cubed, cooked sweet potato
- 6 diced tomatoes
- 1/2 cup freshly ground peanut butter
- 1/2 cup water
- 3/4 teaspoon chili powder
- 1/4 teaspoon cayenne pepper (or more if you like it hotter)
- fresh cilantro leaves (optional)

Heat the oil in a frying pan and saute the onions and garlic over medium heat until tender. Add the cauliflower and cook for 3 minutes. Add the sweet potatoes and tomatoes and simmer for 1 minute. Add the remaining ingredients and cook about 5 minutes more. Add salt to taste and serve with cooked rice or millet. Garnish with cilantro leaves.



★ Peanut Salad Dressing ★

Makes about 2 1/4 cups

Preparation time: 10 minutes

Cooking time: 10 minutes

- 1 clove garlic, chopped finely
- 2 scallions, chopped
- 1/2-inch piece of ginger root (peeled), minced
- 1/4 teaspoon cayenne pepper
- 3/4 to 1 tablespoon peanut oil
- 3 to 4 tablespoons chunky homemade peanut butter
- 1 cup water
- 3/4 to 1 tablespoon brown sugar
- juice of 1 lime

Pound the chopped garlic, chopped scallions, minced ginger root, and pepper into a fine paste with a mortar and pestle or a food processor. Heat the oil in a heavy pan and fry the paste over medium heat until the sharp tang of garlic mellows, about 1 minute. Stir in the peanut butter and blend well. Gradually pour in the water, stirring until the mixture is well blended. Add the sugar, increase the heat to medium high, and bring the mixture to a boil, stirring constantly. Remove the pan from the heat and pour the dressing into a bowl. Stir in the lime juice and let the dressing cool.

Adapted from Brennan, Jennifer, The Cuisines of Asia (New York: St. Martin's Press, 1984).



★ Szechuan Noodles ★

Serves 4

Preparation time: 15 minutes

Cooking time: 5 to 8 minutes for pasta

- 1/2 pound linguini, cooked
- 1/4 cup peanut butter
- 1/4 cup warm water
- 3 tablespoons soy sauce
- 2 tablespoons wine vinegar
- 1 tablespoon dark sesame oil
- 1 teaspoon hot chili oil (or one dash cayenne pepper)

Cook the pasta. Mix the rest of the ingredients for the sauce, add to the noodles, and toss. You can also add chopped scallions, cucumber cubes, sesame seeds, or sunflower seeds.

Activity: Create a New Recipe

Make a new recipe using roasted or raw peanuts or peanut butter. It could be simple or complicated, cooked or uncooked. After you test it on friends and family, submit it to your local paper to include in the food section. You may become famous!

The Reflections of Samuel Purvis

Samuel dozed and his thoughts tumbled as the hearse bounced toward its destination of Carlisle, Pennsylvania. He felt safer than he had in weeks. Two years earlier, the Pennsylvania Anti-Slavery Society had been organized. Knowing that people were interested in slaves' concerns made Samuel feel a little better. Before Pennsylvania and New York were declared "free" states, many slaves had lived there. But unfriendly people were still more common than the kind "conductors" he had met along the Underground Railroad.

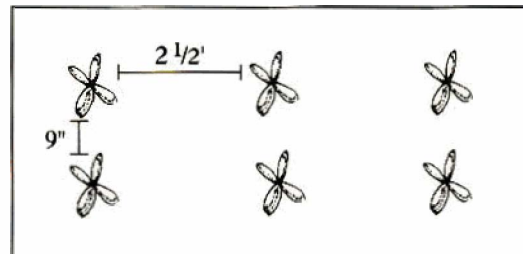
Samuel thought of his mother, Anna, and the tales she had told him, which had been passed along from her grandmother. She had shared these stories quietly with him, and they had helped him get through the days of hard work as a slave, which often had continued into the night. Anna had been cautious when she told him of his ancestors and the heritage he cherished, because their master had not allowed talk of Africa. Samuel had learned from Anna how to tend the groundnuts in his pocket, with their oily, nutty flavor and life-giving qualities.

When Samuel was a child, he and Anna planted groundnuts in a plot behind the cabin they shared with his two sisters, a sunny spot that was hidden from view. Anna showed Samuel how to work up a rich patch of sandy loam and how to avoid the clay soils that would not be as good. She taught him about the two types of groundnut: bunch and runner. The runner, more common in West Africa, was shorter and ran 1 or 2 feet along the

ground. The bunch type that Anna grew was more bushlike, growing about 1 foot to 18 inches tall. This type was easier to harvest than the runner, yet it yielded less. When she was able to cook, Anna used the leaves of the plants in soups, just as her grandmother had, and they ate the seeds, or "nuts," raw.

★★ Describe two types of peanut.
Describe a garden site that peanuts like to grow in.

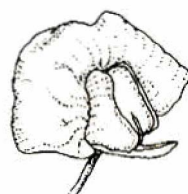
As a child, Samuel had helped Anna plant the seeds, always after a rain in the spring. They placed the seeds about 2 1/2 feet by 9 inches apart. Anna was fussy about this, saying that at a wider spacing, room was wasted. Samuel notched the days on a stick from the time the seeds were planted to the time they began to flower—45 to 55 days on average.



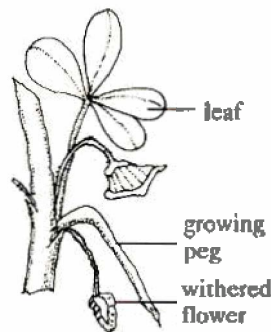
Small yellow flowers grew low on the plant and looked like the flowers of the sweet pea that bobbed in the breezes along the path to the fields. Flowering lasted for two full moons, although each flower only bloomed for a day. Samuel enjoyed



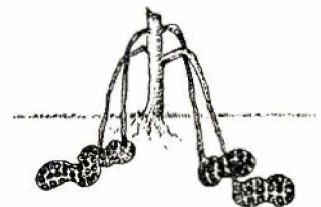
Peanut plant in full bloom



Peanut flower



A stalklike peg extends from the withering flower and grows toward the soil.



The tips of the pegs penetrate the soil and grow into mature peanut pods.

watching the flowers wither, for it meant that soon the fruit would enlarge. The shriveling flower extended into a stalklike peg. The tip of this peg carried the immature groundnut. As the peg began to swell, it grew toward the soil and penetrated the rich, loamy surface.

★★ Suppose you are trying to describe to someone how a peanut plant grows. Draw a cartoon of a peanut flower as it withers and bends to the ground as a peg.

Anna scolded Samuel about disturbing the soil after the groundnut entered the earth, but he couldn't help himself. He knew from past investigations that the groundnut could push itself into the soil about 1 to 3 inches deep. The tips of the pegs would begin to grow larger. Then the tips would develop into mature groundnut pods. Having notched a stick to count the days, he knew that it would be about 70 days, give or take 10, from the time the pegs disappeared to when the groundnuts were mature.

Samuel was always amazed by how groundnuts withstood the hottest weather. Even after a drought, the plant would perk up with a rain. He noticed that the hotter the season, the shorter the period of ripening.

★★ Add up the time it takes the peanut to flower, how long flowering lasts, and how many days there are until harvest. Think about our growing season in the North, which is roughly three to three and one-half months. Peanut plants are very sensitive to frost. What does this tell you about growing peanuts in the northern United States?

When the seeds inside the pod showed a deep, rich pink color on the seed coat and when the inside of the pod turned dark and sported tiny veins, Samuel knew that harvest had come. It frustrated him that the seeds did not ripen at the same time.

Someday he would devise a way to shorten the period of harvest. He knew that pulling plants up too soon would provide a poor crop. Yet a late gathering of groundnuts would be a waste of work, because most would break off from their pegs and remain in the soil. He tried to harvest at an "in-between" stage to get as many ripe groundnuts as he could.

Anna and Samuel pulled up the groundnuts at night to make sure that the crop was theirs to keep. They loosened the soil around the plants and gently pulled up entire plants. After shaking the plants to brush off the sandy loam, they chose a place near the cabin where the sun would dry the pods. The freshly harvested groundnuts were made up of almost 50 percent water, and this needed to be reduced if the seeds were to store well.

For four long days, the seeds dried in the sun—four nervous days for Samuel. On the fifth night he and his sisters and mother hand-picked the pods, spreading them for their final drying. During a bumper crop one year, this activity had taken until morning. After the groundnuts were thoroughly dry, Samuel carefully stored them in the cabin. His next worry was protecting them from rats and mice.

★★ Why do you suppose the four days of waiting were nervous ones for Samuel? Name all the animals (and people) that might love the taste of peanuts.

Although Samuel's family loved the groundnuts dearly, they did not grow them in this ideal, sunny location each year. Anna insisted on letting the soil "rest" every third year. If she found vegetable seeds or some grain, she threw a little onto the soil, saying that another crop helped keep the life in their groundnut planting. Samuel vowed that if he could make groundnuts grow at his new home, he would try to figure out whether his mother was right, and if she was, why.

Ponder This

Samuel couldn't have spent all his time growing peanuts for his family. What do you think Samuel's other work was like?

Do you think that men and women did different work?

How do you suppose the work of African Americans in the North differed from those living in the South?

Activity: The Peanut—A Nut or Not?

Actually, the peanut or groundnut is not a nut at all! The peanut is a member of the pea family, or Fabaceae (fab-AY-say-ee). The part we refer to as the “nut” is really a seed enclosed in a pod. It is made up of 30 percent protein, more than 12 percent carbohydrates, and a generous amount of fat. One-half cup of raw nuts contains a whopping 414 calories.

The peanut plant is an annual. That means the plant dies at the end of the season when fall frosts come.

Peanuts are divided into two types: Virginia and Spanish. Virginia peanuts do not flower on the main stem, require a lot of water to grow, and tend to mature later. They also are large seeded. They include the runner type of peanuts that Anna taught Samuel about, which have branches that spread 2 feet or more.



Virginia-type peanut plants send out branches, mature late, do not flower on the main stem, and have large seeds.

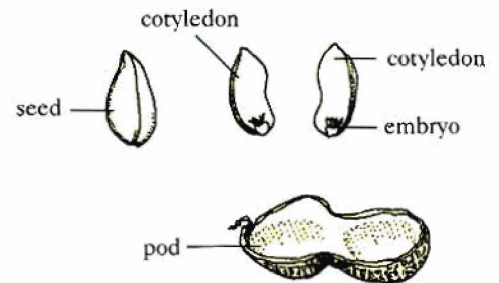
Spanish peanuts flower only on the main stem, have a shorter season, and are better suited to the more northern peanut-growing areas. The Spanish types have a more upright habit of growth, are smaller seeded, and require less water. These are the bunch types that Anna told Samuel about.



Spanish-type peanut plants are erect, mature early, and flower only on the main stem.

Look at an unshelled peanut. Split open the shell, or pod. How many seeds are there per pod? The skins of the seeds may be white, purple, red, pink, peach, light brown, rose, or bicolored. What color is yours? What is the shape of the seed? Crush a peanut seed between your fingers, or mash it with a spoon. Can you see why the peanut contains so many calories?

The *embryo* (EM-bree-oh) of the seed is located between two large seed leaves. Split the peanut seed apart. The two halves are called *cotyledons* (cort-ill-EE-dons). The meaty cotyledons provide nutrition for growing. The part of the peanut that we eat is actually stored food for the embryo.



A peanut is really a seed enclosed in a pod.

Place several peanut seeds on moist paper towels. Keep the towels moist. Check the peanuts each day. Where does the sprout form? What happens to the two cotyledons?

Activity: Comparing Members of the Pea Family

Members of the pea family are commonly called *legumes* (LAY-gewms), or *leguminous plants*. These include alfalfa, lentil, sweet clover, peas, sweet peas, common bean, crown vetch, peanut, and soybean. Trees can be legumes, too. Black locust, cassia and redbud are common leguminous trees. If you live in the city, different types of clover can be found in almost any vacant lot, and sweet peas and redbud are common garden plantings.

Legumes are very valuable to people. This exercise will help you learn their names and see how they are alike.

Make a list of all the legumes that you can find growing in your neighbor-

hood and another list of those planted by farmers.

As a group, collect as many leaves, blossoms, and seed pods of legumes as you can find. Dig up some roots, and save them for the activity "The Peanut as a Nutrient Grabber" on page 15. Bring all the specimens to a table where you can examine them.

Look at the leaves. How are they arranged? Are the leaves simple (all in one piece), or compound (divided into several leaflets)? How do the leaves compare? Draw several leaves and identify the legume plant they belong to.

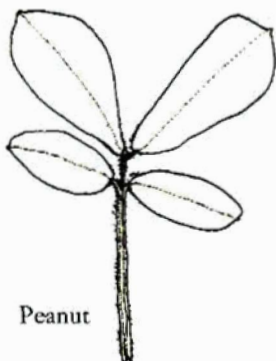
Are the leaves alternate (no two leaves are at the same level along the stem) or opposite (the leaves are at the same level)?

What do the flowers look like? Make a drawing of the blossoms.

Split a peanut, pea pod, bean pod, or locust pod open. How does it open? What is inside?

Think of the leaves, flowers, and seed pods that you have compared. Which of these are more alike among the plants? Which are different or unique? What are the common traits of all the plants?

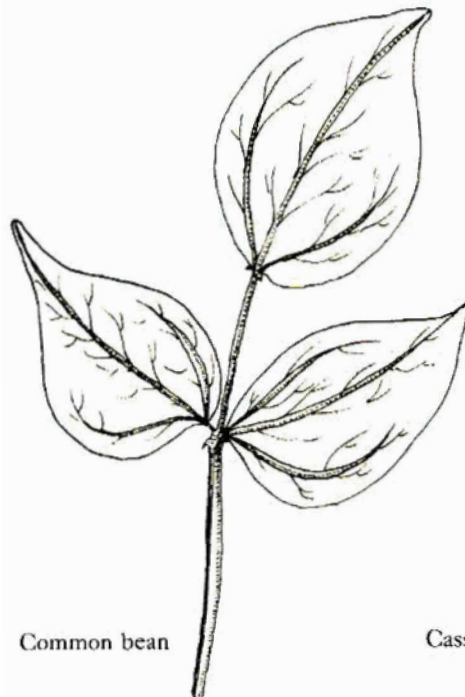
If you found a strange plant, which parts would you study to decide if it was a legume?



Peanut



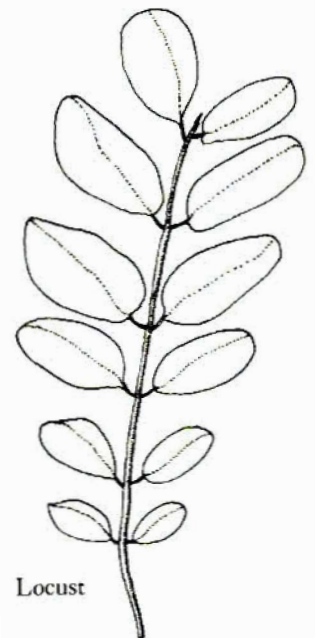
Lentil



Common bean



Cassia



Locust

Leaves of leguminous plants

Activity: Starting Peanut Plants from Seed

Peanut seeds can be ordered through a seed catalog or from the companies listed on this page. Many natural food stores sell raw peanuts, and gardeners may have good luck growing them. The drawback of using these seeds is that you will not know which variety you are planting.

The Spanish or bunch type of peanuts are better suited to growing in pots than peanuts of the Virginia or runner type. Some commercial peanut seeds are treated with fungicide, so don't eat them!

Before you plant your peanuts, soak half of them in water at room temperature for several hours (but no more than eight hours). When you plant the seeds, label the containers "soaked seed" and "unsoaked seed."

Fill the planting containers with damp soil or soil-less mix. Place three or four seeds in each pot, about 3/4 inch below the soil surface. Water the pots well, and be sure that the soil in the pots remains moist but not wet. The soil should almost dry out between waterings. Put the pots in the sunniest window you can find.

How many days pass before you can see the plant coming through the soil? Is there a difference in time between the soaked and unsoaked seeds?

Materials Needed

Potting media—soil or soil-less mix
Peanut seeds—at least 15
Several 10-inch pots with drainage holes

Peanut seeds are available from

DeGiorgi Seed Company, 6011 N Street,
Omaha, NE 68117-1634

Henry Field's Seed and Nursery Co., 415
North Burnett, Shenandoah, IA 51602

Gurney's Seed and Nursery Co., 110
Capital Street, Yankton, SD 57079



Look at the plants as they emerge. Do they look like other plants you know?

Show them to friends and neighbors and ask them to identify the plants. How many of them are right? What do your friends think the plants are?

When the plants are about 3 inches high, remove all but one of the seedlings. This is called thinning. You have invested time in growing the plants and may be tempted to let all the plants live. But thinning is important. Do you know why? What is the purpose of planting three or four seeds if you end up removing all but one plant? What happens if you don't thin? What happens if you only plant a single seed?

Now that you have plants growing in the pots, save them for the growing exercise "Help Samuel Grow Peanuts" on page 17.



Peanut plants are very easy to start from seed.

Activity: The Peanut as a Nutrient Grabber

Peanuts have particular growing requirements, and if you meet these, they are easy to grow.

After years of trial and error, Anna had the system down pat. Most cultures pass knowledge through families and share their experiences through the generations. Young people often learn a great deal from their grandparents or older relatives. This ensures that what works well will continue, and this is how Samuel learned how to grow and care for peanut plants.

Anna knew the importance of looking for the best site possible: one that received full sun and had a light-textured or sandy loam soil and no standing water. Peanut plants benefit from the addition of organic

matter to the soil. Organic matter comes from decomposing plant or animal material, such as animal manure, compost, or decayed leaves. Nitrogen is a very important plant nutrient as well.

Peanuts, like other members of the pea family, are known for their ability to “fix” nitrogen. All plants can take nitrogen from compounds in the soil. Legumes are unique in that they can get this nutrient in two ways. They can get nitrogen from the soil, and they can take nitrogen from the air and make it into a form that plants can use.

A common error is to assume that because legumes can get nitrogen from the air, they do not need much of it in the soil or from soil fertilizer.

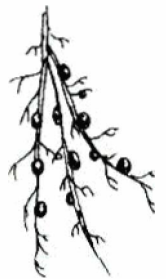
Although they can thrive in nutrient-poor soil, nearly all legumes grow better in soil that has adequate nutrients.

Collect the roots that you have saved for this exercise from the activity “Comparing Members of the Pea Family” on page 13. Lay them out on a table where you can examine them.

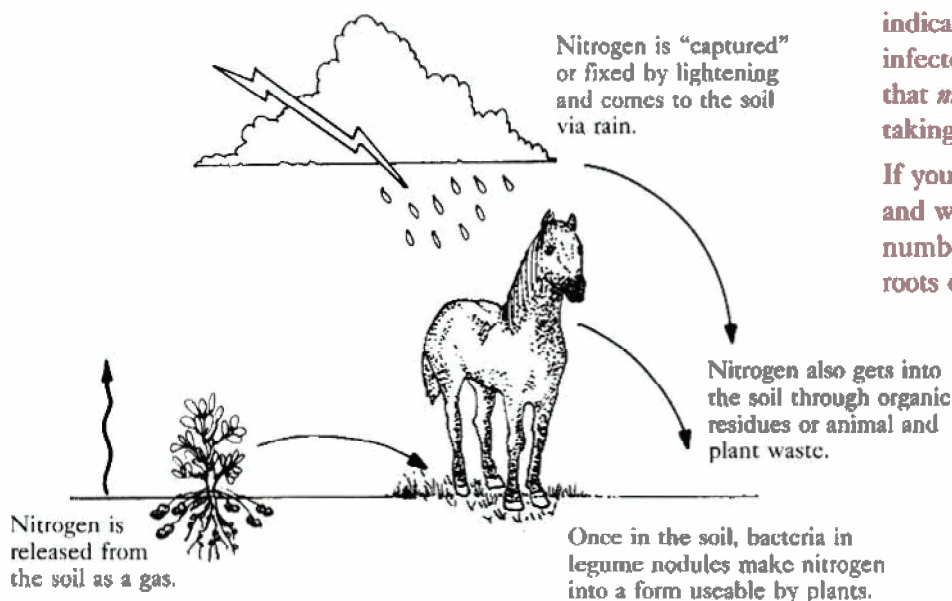
Is there anything unusual about the roots? Do you notice small growths on the roots that you may not have seen before? It is likely that you will see little lumps, or nodules (NODGE-you-ulls). These are an infection of the roots caused by a special bacteria. This is one infection, unlike a cold or the flu, that growers are glad to see!

Working as a team, the bacteria and roots “fix” nitrogen from the air to a form that plants can use. The nodules that you see indicate that the roots are infected by the bacteria and that *nitrogen fixation* is taking place.

If you have both cultivated and wild plants, are the numbers of nodules on the roots of each different?



Nodulation on roots



The nitrogen cycle

Samuel Purvis Arrives in Carlisle, Pennsylvania

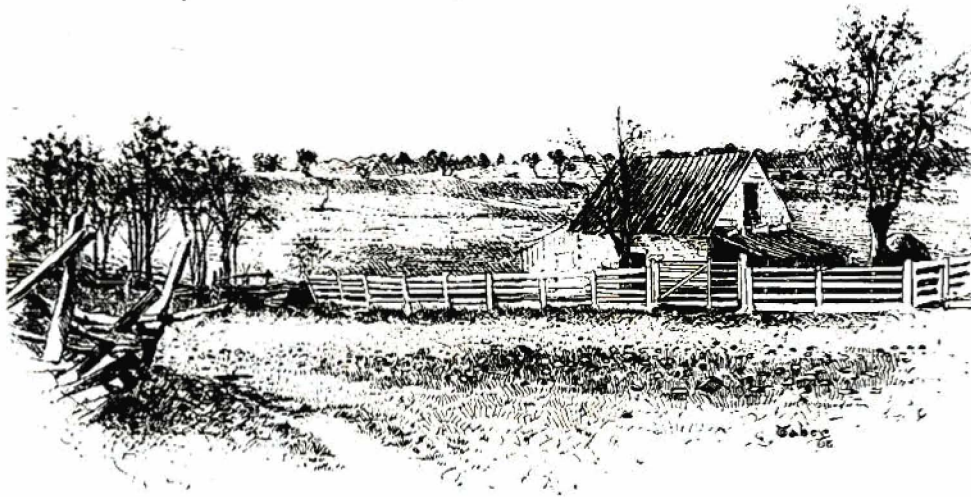
Samuel heard the distant sounds of dawn. The roosters announced the coming of sunrise, and activity in the valley began to increase as horses and people slowly made their way to markets in Carlisle. Too exhausted to stay alert any longer, Samuel slipped into a deep sleep and began to dream.

In his dream he was in Africa, preparing nguba butter for the evening meal with his extended family. They sang as they mixed the raw ngubas in their shells with clean sand. They baked this mixture, then removed the ngubas

from the sand and shelled them. Many people joined in to grind the nguba seeds with oil to create a delicious paste. That night there would be much feasting and dancing....

The road took a sharp turn, and the box that carried Samuel shifted sharply. As it did, his dream launched him ahead to the turn of the twenty-first century. He saw a nation that loved groundnuts, due in part to the vision of an African American man named George Washington Carver, who was wise enough to see the potential of the crop.

The hearse that held Samuel Purvis finally reached its destination. The horses whinnied a greeting to their friends in Carlisle, and the sound nudged Samuel from sleep. His back was sore, and he was drowsy with slumber. As he struggled to wake, kind hands reached in to help him climb from the box that he had lain in for nearly 18 hours. He reflected on his dream and the message that he was sure was meant for him: that his beloved groundnut—and people—would thrive!



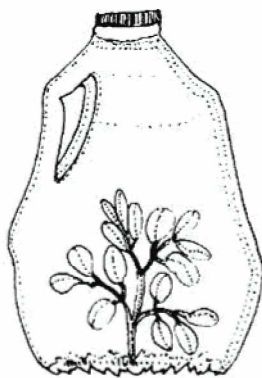
Activity: Help Samuel Grow Peanuts

Gardeners in the North have to be creative! Late spring frosts limit the number of plants that can go into the ground much before June, especially sensitive plants such as the peanut. Just as a gardener is harvesting the fruits of his or her labor, early fall frosts come along to shorten the growing season. It can get pretty frustrating.

Fortunately, gardeners throughout the centuries have always managed to work with their surroundings, even in the frosty North. French gardeners used bell jars, or cloches (CLOSH-ez), which they placed over their plants to get early produce. Cloches worked well, but they were troublesome to manage. A major problem was the need for constant attention. Temperatures in the cloches could rise so quickly that the plants would die if the covers were not lifted during the day.

There are two types of protective plant covers: those that cover single plants and those that cover an entire row of plants. Hot caps or tents are small paper covers that shelter individual plants. Easy to use, they are placed over the plant and secured by mounding soil at the base of the cover.

You can make a simple hot cap out of materials that you have at home, such as by removing the bottom of a plastic milk or cider jug. Another single plant cover can be made by wrapping a tomato cage with a sheet of plastic to form a cylinder around the plant. The cap or tent must be large enough so that leaves do not touch it and suffer heat damage.



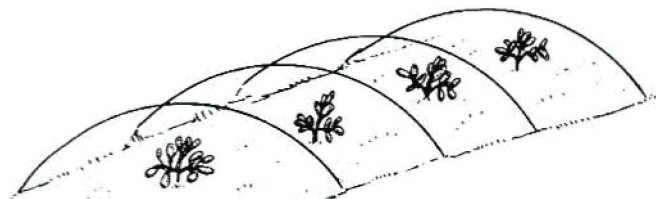
You can make your own protective plant cover.

Cloches, hot caps, and other plant covers work because they act as a mini-greenhouse to trap heat next to the plants. No matter how a plant is protected, the cover must be ventilated. When gardeners use caps, they listen to the weather forecast each morning. If a warm day is expected, they prop the cap up slightly so that air can get in, and then they remove the prop at night. Cutting slits in the sides of hot caps or removing the lids from plastic jugs are other ways to ventilate plant covers.



Hot caps or tents shelter individual plants. They act as a mini greenhouse, trapping heat from the sun.

To cover a row of plants, gardeners and farmers make tunnels by unrolling a plastic material over a series of hoops made from wire cut into 3 1/2-foot lengths. Several types of tunnel materials are available.



Row cover made with plastic material and hoops

With frost-sensitive crops like the peanut, smart gardeners often use frost protection both in the spring and in the fall to stretch the growing season as long as they can.

Here's a special challenge for you. How can you help Samuel Purvis realize his dream of growing peanuts in the northern United States? He is new to the long winters. Coming from an area with a long growing season, he cannot believe how short the summer is in the North! He has only a handful of his beloved groundnuts, so your advice is important.

Design a way to grow peanuts that fits into a May to September gardening season. No methods are "right," but some may work better than others. Use your creativity to think of ways to protect the plants with materials that you may have at home. Bear in mind that you may need to protect them from both late spring and early fall frosts.

Based on your growing plan for Samuel, experiment with a planting of your own. You can use the transplants that you started earlier. You can also use large containers.

How do you plant and space peanuts? Perhaps you can remember Samuel's reflections and follow Anna's advice.



A successful harvest in upstate New York!

Peanuts respond well to loose, well-drained soil, and they thrive in sunshine. Some gardeners plant their peanuts in black plastic, which is spread across the ground and secured before planting. Black plastic is a type of mulch. It warms the soil quickly and gives the plants a head start on the growing season. Other mulches, such as wood chips, grass clippings, and straw, can cool the soil and slow the peanut's growth and are not recommended. If you use black plastic, you may want to remove it at pegging time.

Dig up one plant in September to see if the "nuts" are mature. If they are soft, pale, and spongy, they are not ready. The shells will dry, darken, and harden as they ripen, and the skins will turn a deeper color.

When your peanut plants are mature, harvest the whole plant and let the peanuts dry on the plants for several days in the sun (or in a dry room if the weather doesn't cooperate). Then remove the peanuts and roast them in their shells in the oven (325 degrees for 15 to 20 minutes) and enjoy them in peanut butter and other recipes, or cook them raw as you would peas and beans.

Try saving some dry, unroasted peanuts to plant next year. Be sure to select from your best plants and keep the seeds in the shells.

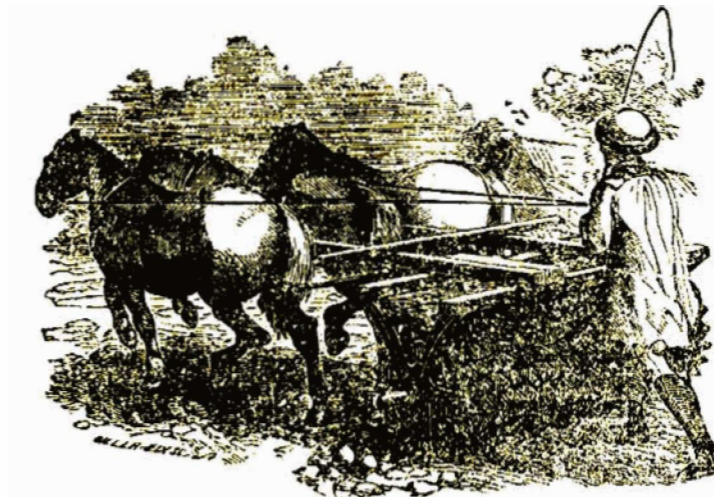
What Have You Learned?

By now you have learned a lot about peanuts. You have learned the history of an important crop, you have followed the route of that crop around the world, and you know how to make that crop grow. You have learned why the peanut, along with other members of its family, is a good crop for the soil and for people to eat. You have even started your own plants.

You have become acquainted with Samuel Purvis, a fictional character, as well as a man named George Washington Carver,

who had a tremendous impact on agriculture in the southern United States and on the food preferences of our nation.

By attempting to grow the peanut at home, you have been introduced to a major concern about plant production in the North: the short growing season. Even if you haven't grown bushels of peanuts, you have helped Samuel Purvis fulfill his dream of growing peanuts in the northern United States!



Notes

1. Adapted from Atta Annan Mensah, *Folk Songs for Schools* (Acera-Tema: Ghana Publishing Corporation, 1971), p. 29.
2. F. Roy Johnson, *The Peanut Story* (Murfreesboro, N.C.: Johnson Publishing Co. 1964), p. 3.
3. Rackham Holt, *George Washington Carver, An American Biography* (Garden City, N.Y.: Doubleday, Doran, and Company, Inc., 1943), p. 224.
4. *Ibid.*, p. 228.

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