

LESSON 7

PEOPLE AND THEIR ENVIRONMENT



Students will hear accounts of the river environment during different time periods; visualize and depict, through drawing, each time period and record and discuss the potential impact people had on the environment of the Santa Cruz Valley.



LESSON OVERVIEW

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Subjects

Social Studies, Art, Science

Standards

Science as Inquiry
History and Nature of Science
Science in Personal and Social Perspectives
Life Science

Objectives

Students will:

1. Read essays from three different time periods.
2. Use critical thinking skills to answer questions related to assigned readings.
3. Write or depict, through drawing, a hypothesis for future events.

Preparation

Copy *Master Page 7.10* for each student; Have available *Master Pages 7.4 - 7.9* (or optionally make copies for students to work in groups.)

Vocabulary

aquifer, *cienea*, culture, depleted, endangered, extinct, meandering, monsoon, *presidio*, population

PEOPLE AND THEIR ENVIRONMENT

TEACHER BACKGROUND INFORMATION

The environment of the Santa Cruz River Valley has changed significantly over time. Evolving from a prehistoric Hohokam site, it was home to the O’odham at the time of historical contact.

As no written record exists before Father Kino’s arrival we can only attempt to imagine what the area looked like.

The Santa Cruz was subject to drought and flooding with

weather dictating how much surface water flowed. Primary tree species like cottonwood,

willow, mesquite and Mexican elder were probably much the same as we see today. Smaller shrubs and plants may have been displaced, however, by introduced or exotic species. The impact the Native Americans had on the environment was probably

minimal due to their small populations, but it did exist. Living off the land meant utilization of natural resources needed for food, construction materials and heat.

With Father Kino’s arrival in 1691, environmental impact increased minimally, given the fact that for the first forty years the priests only occasionally visited most sites. As more European settlers arrived, the



advent of townships meant higher population and more impact. Introduced foods and

species began to change the lifestyle and environment of the native people. Introduced livestock helped to spread some native plants like mesquite while native grasses were displaced by introduced or “exotic” species like Johnson Grass.

LESSON 7 - PEOPLE AND THEIR ENVIRONMENT

Impacts around settlements like Tubac were great as a result of large herds of livestock and other human activity while the surrounding rural areas were relatively unchanged. Environmental impact was greatest with the Americans in the 1880s. With the advent of the train, coupled with increased human population, mass-scale agriculture and ranching, the land and its resources were compromised. Exotic species were introduced, fields were cleared, forestry resources removed and animals extirpated. Water, too, was affected, and, by 1971, surface flow in the Santa Cruz essentially stopped except during the rainy seasons.



Today we are again able to enjoy the environment of the Santa Cruz River and get a feel for the area where the O'odham once lived. The river now flows year-round between Rio Rico and Tubac thanks to treated water from the Nogales International Wastewater Treatment Plant. Many groups like Friends of the Santa Cruz River, the Anza Trail Coalition, Arizona State Parks, US Fish and Wildlife and the National Park Service work together to maintain a healthy environment and insure a future for the river.

What does our future look like?

What do our youth think?

Hopefully, participating in the following activity will encourage students to think, formulating ideas - a small step towards conserving our heritage.

Part 1

1. Read aloud the description and quote *The River Valley Before 1752* on **Master Page 7.4**. Have the students try to imagine, painting a picture in their minds of who lived there and what it might have looked like.
2. Show students the artist's depiction of Tubac on **Master Page 7.5** and discuss whether or not it matched their vision of what they thought it looked like. Emphasize that this is one artist's depiction and is not meant to be a "photo" of what it actually looked like.
3. Based on their impressions of "The River Valley before 1752," have students answer the questions on **Master Page 7.10** as best they can, either individually, in small groups, or together as a class.
4. Repeat steps 1 through 3 for each of the following periods, completing **Master Page 7.10** for each time period:

The River Valley Before 1752:

The O'odham people hunt, gather and farm the Santa Cruz River valley.

Master Pages 7.4-7.5

The River Valley After 1752:

The Spanish settlers brought new ideas, technologies and lifestyle to Tubac.

Master Pages 7.6-7.7

The River Valley in the 1900s

Many changes occur with the coming of the Americans, railroad, industry and technology.

Master Pages 7.8-7.9

Part 2

1. Discuss the following questions and compare with your students' answers written on *Master Page 7.10* for each time period.

Who lived in Tubac?

Was there more than one culture?

What effect, if any, did these people or their culture have on the environment?

Did the number of people (population) have any effect on the environment?

Was anything threatened, drastically changed, endangered, or made extinct?

If you could live in Tubac during any one of the three time periods, which one would you pick? Why?

Which time period would you least like to live in? Why?

2. Hypothesize possible outcomes should Tubac become the size of Green Valley, Nogales, or even Tucson. What are the pros and cons?

3. Ask students to complete the fourth column, "After 2025," on *Master Page 7.10*.

4. Assign students to make a sketch or written description about what they think the river valley might look like in the future, say in the year 2025.



Enrichment

- Instead of reading aloud to the class, make copies of selected readings and have students read in groups.
- Ask students to redraw a picture of Tubac in 2025 that reflects the following question: "If you were in charge of developing the town, what would you do to make it a great place to live?"
- Invite a local developer or real estate agent to talk with them about present or potential development projects in the area.
- Take a field trip to the river or the cienega at Meadow Hills Housing area in Nogales to get a feel for what the river looks like today.

The River Valley Before 1752

Before 1752, the overall Santa Cruz Valley looked different than it does today. The river was *meandering* and surrounded by *ciénegas* (swamps or wetlands). Rainfall was probably not much different from today. However, when it did rain, the *ciénegas* temporarily held the water until it had time to soak into the ground, in drought years returning it to its natural underground storage, or *aquifer*.

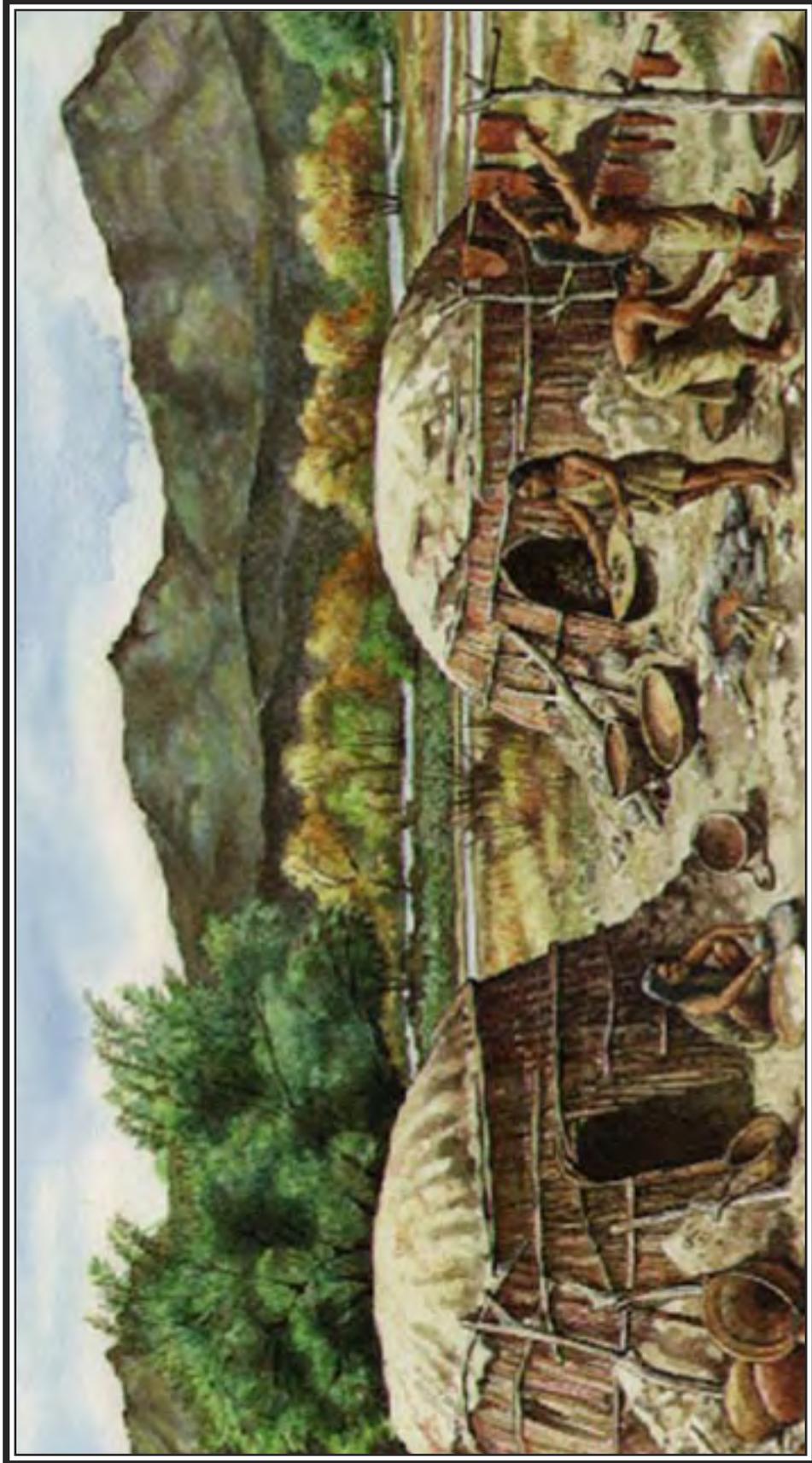
The *ciénegas* or wetlands also offered water, food and homes for wildlife such as jaguar, beaver, otter, wild turkey, grey wolf and bighorn sheep. None of these are found in the Santa Cruz Valley today.

The river (*riparian*) and forest (*mesquite-bosque*) environments were possibly dense with similar trees, but different plants and grasses. The main human inhabitants were the O'odham who lived in simple mud and stick homes, and did small-scale farming and hunting along the river.

During the twenty years following Kino, what he accomplished appeared to be in danger of being lost entirely, principally because Indian enemies constantly attacked the frontier settlement. The O'odham gathered in pueblos were without adequate means of protection. Enemy Indians began their raids upon the Spanish frontier before Kino's time. As early as 1703 Kino made the following entry in his memoirs:

The early explorers found several thousand people whom they called Sobaipuris (a branch of the northern Pimans) residing in more than a dozen small villages scattered along the perennial reaches of the river, often near 'ciénegas' (marshes). The populations of these kin-based 'rancherías' (encampments) varied from 80 to 900 persons. Their houses were constructed of poles and woven mats. Vaulted roofs covered by several layers of matting could withstand precipitation. Supplied by vast networks of irrigation canals, extensive fields produced a surplus of corn, beans, squash, melons, cotton, and tobacco. On seasonal gathering trips to the surrounding desert, the river-dwelling villagers supplemented their diet with agave, cactus fruits, desert "greens," and saguaro fruit for making wine ... The villagers kept wild fowl, including 'guacamayas' (Macaws or possibly Thick-billed Parrots), whose feathers they valued for decoration. Wearing garments of 'gamuza' (expertly tanned antelope or deer skin) or woven cotton cloth, they greeted the missionaries with dancing, shouting, and banquets, and showered them with so many gifts of food, including fish from the river ... Early descriptions of Sobaipuri villages on the Santa Cruz depict a people living in a balanced relationship with their environment.

From Diana Hadley, Arizona State Museum



From *Las Capas*, by Michael Hamshire

The River Valley After 1752

Because of the Pima Revolt of 1751, the settlers in the Santa Cruz Valley asked Spain for a presidio (a garrison for soldiers and their families) to be built at Tubac. It was completed about 1752. The nearby Jesuit, black-robed missionaries decided that a church was needed close enough to the presidio for protection, but far enough away for independence. They chose the spot where Tumacácori is now located. The first church, now only an adobe foundation, was built sometime between 1752 and 1757. The introduction of the presidio at Tubac and the church at Tumacácori established the first permanent non-native settlement in present-day Arizona.

The Tubac Presidio housed fifty soldiers, their wives and children. With them came new farming techniques, guns to make hunting easier, and imported cattle and other livestock. Within two years 300 people were living in Tubac and the population grew to 500 by 1767. Areas were cleared for the Presidio and for farming.

During the next hundred years changes to the environment were greater compared to that of the Native Americans, but remained minimal. Apache attacks kept the population small and no significant development occurred. The human population varied, but remained low.

A few adventurous pioneers grew crops, raised stock, or operated small gold and silver mines in the outlying areas such as Arivaca and the San Pedro Valley, but most Spaniards continued to live along the Santa Cruz. The rest of Arizona remained in Native American hands.

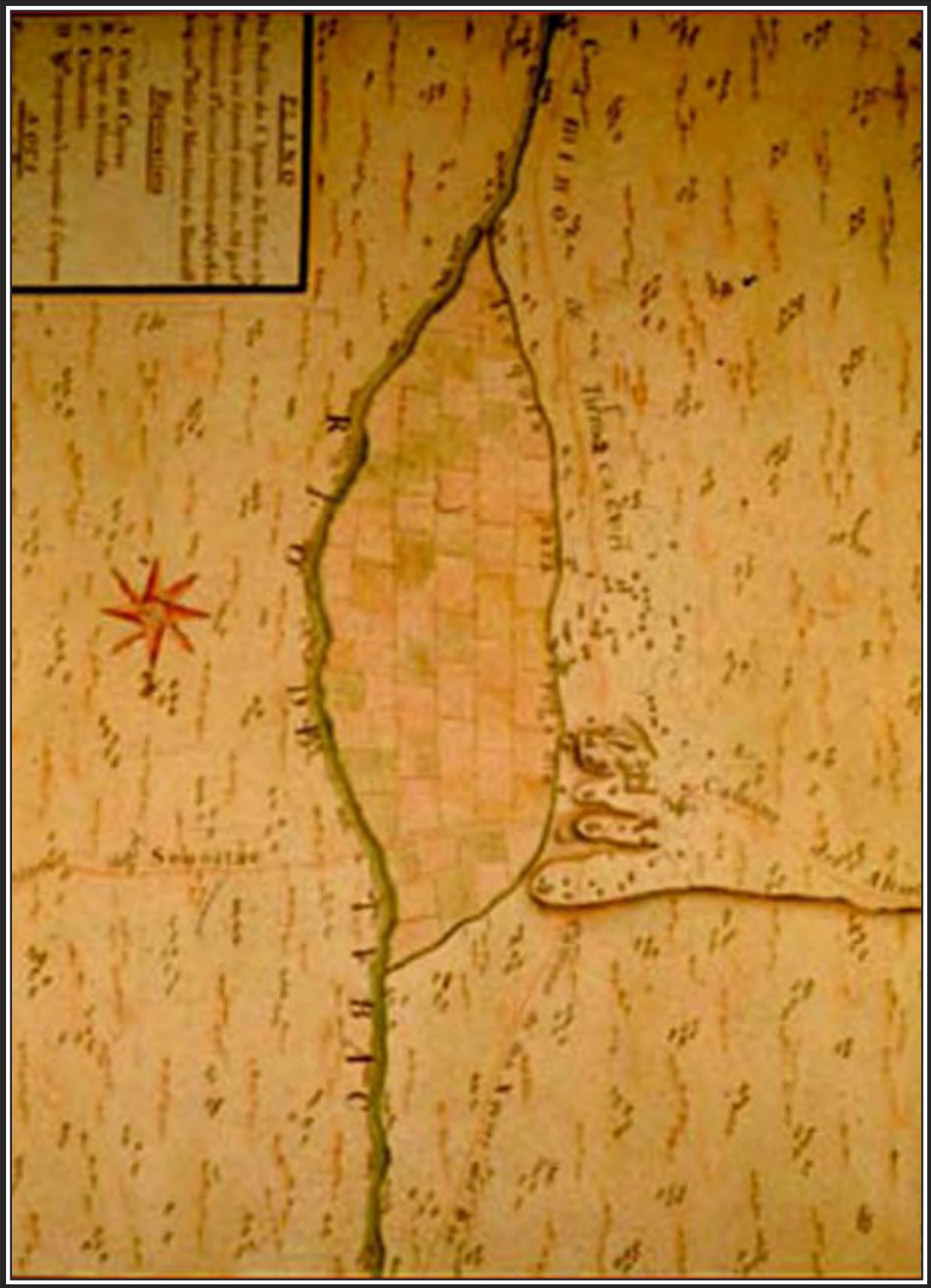
Despite their small size, communities like Tucson and Tubac were . . . not impressive: flat-roofed adobe buildings clustered beside a ragged patchwork of fields. As Tucson's Captain José de Zúñiga noted in 1804, "We have no gold, silver, lead, tin, quicksilver, copper mines or marble quarries." He went on to say, "The only public work here that is truly worthy of this report is the church at San Xavier del Bac."

Spanish frontiersmen were as tough as any pioneers on the North American continent. They knew the desert and they knew the Indians—fighting, sleeping, and dying with Tohono O'odham from the western deserts, Pimas from the San Pedro Valley, Apaches from the eastern mountain ranges, and even Yaquis from southern Sonora and Yumans from the Colorado River.

The most important crop was wheat, followed by corn, beans and squash. The most important animals were cattle and horses, although a herd of 5,000 sheep at Tubac produced enough wool for 600 blankets in 1804. During times of relative peace, farming and ranching expanded along the Santa Cruz and spilled over into watersheds. But whenever Apache raiding intensified, herds dwindled, fields were abandoned, and families took refuge behind presidio walls.

It was a harsh way of life. One that swung like a pendulum between flood and drought, peace and war. Nonetheless, it endured. The people of Hispanic Arizona may not have been able to extend the empire, but they held on to their little piece of it in the face of great odds. Like rawhide, the sinews of their culture bound them together and bound them to the land.

1767 - From Thomas E. Sheridan, Arizona



The River Valley in the 1900s

Between the 1880s and the 1970s the results of the Industrial Revolution took its toll on the environment along the Santa Cruz River. After Geronimo surrendered in 1886, Tubac resettled and was never again abandoned. The population steadily increased and started to have an impact on the environment and its resources. New technology also brought changes to the area never seen before, mainly the railroad and big cattle operations. The railroad allowed products and crops to be easily transported. This resulted in an increase in large-scale agriculture and cattle ranching. *Cienegas* and *mesquite-bosques* were made into cotton fields. Thousands of cattle grazed and trampled the native plants while other imported species were introduced. Hunting and the killing off of “desirable” (beaver and otter for furs) and “undesirable” (wolf and bear) wildlife increased. Introduced plant species replaced many native species.

The invention of new, more efficient water pumps and well-drilling equipment allowed people to remove water from the underground aquifer easily. The disappearance of many *cienegas* also caused the river to swell and flood during the monsoon rains, threatening land owners.

By 1970 the water in the Santa Cruz River did not flow as it had before, a result of drought and agriculture. Things then changed for the better in 1972. With a combination of increased rainfall, large farm operations closing down and the added water from the new Nogales International Wastewater Treatment Plant, the river between Rio Rico and Tubac flows above historical levels whereas the area between Kino Springs and Rio Rico is still subject to drought and human use. Sometimes it flows and sometimes it doesn't.

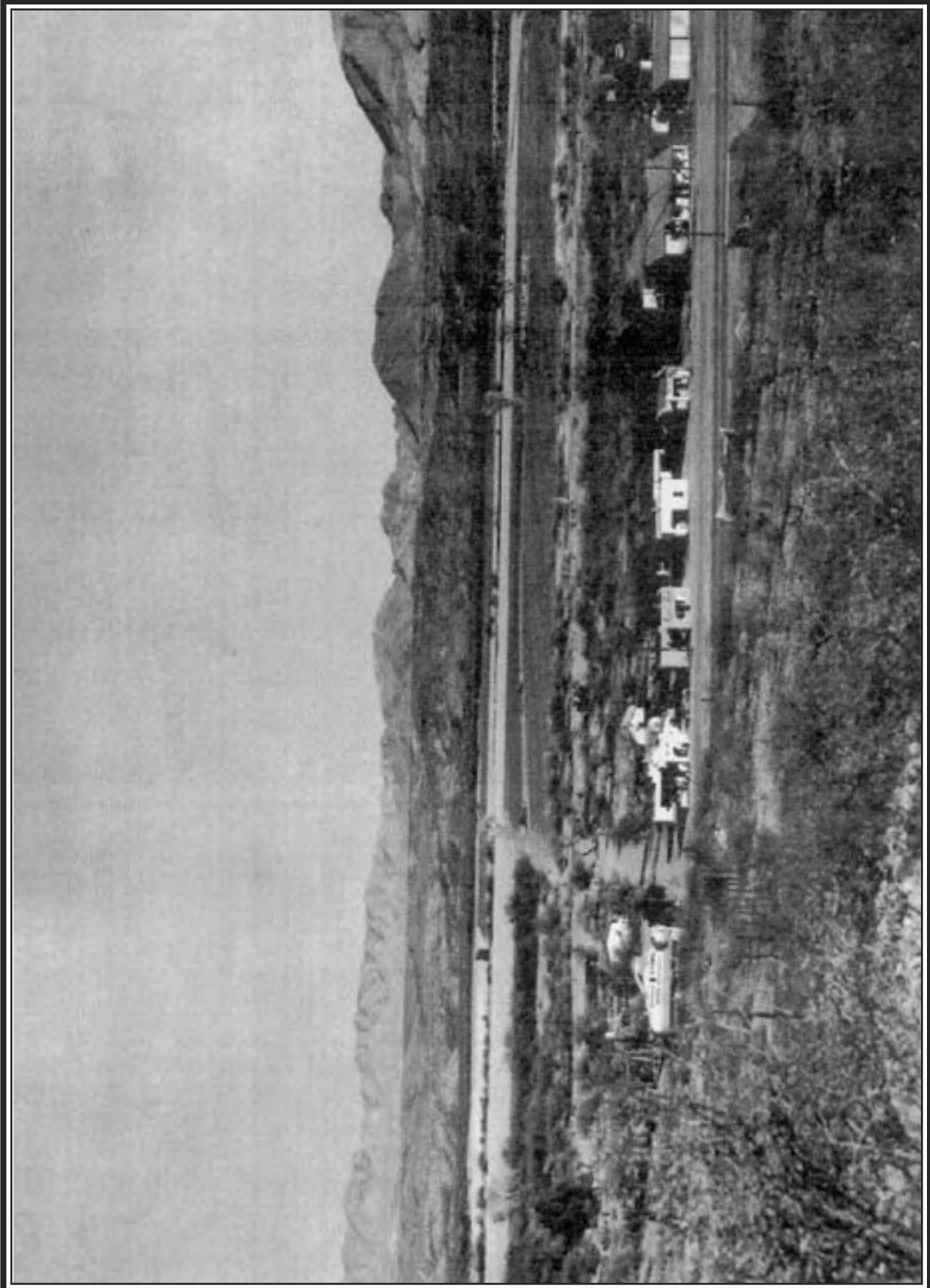
“The [biggest] changes have to do with buildings and cultivated land. Carmen . . . and its cotton fields are new . . . The mesquite bosque across the valley is no [larger] today than before, and the many large trees present there today attest to its great age. Any changes that may have occurred on the hills across the valley, [thickly] covered with white thorn today, aren't easily seen, but the small area or the hillside shows an increase in shrubs. . . No cottonwoods appear along the present channel.

From James Hastings and Raymond Turner, *The Changing Mile*

The land lying along the Santa Cruz River, between Tucson and the [Mexican border] contains . . . valley land, all of which is [good] for alfalfa, sugar, beets, grains, fruits and vegetables of all kinds.

These lands, located on both sides of the river, can be reclaimed by different systems of irrigation . . . to be filled by the waters of the Santa Cruz River during the flood season from July to October, or by the construction of a dam at Guevavi . . . where the bed rock comes near the surface.

From J. George Hilzinger, *Treasure Land: A Story*



Do People Affect Their Environment?

Answer the questions below for each time period:

	Before 1725	After 1725	1900s	2025
What cultures lived in Tubac?				
What animals were found around Tubac? Were any endangered or extirpated?				
What did the river look like? Where did people get their water? Was there enough?				
How many people lived in Tubac? Did the number of people affect the environment? Why?				