Name _____ Date _____

CHAPTER 6

GUIDED READING *The Expansion of Industry*

Section 1

After the Civil War, the United States was still a mostly rural nation. By the 1920s, it had become the leading industrial nation of the world. This immense change was caused by three major factors. Answer the questions for two of the factors.

➔ Factor 1: Abundant Natural Resources

1. Which resources played crucial roles in industrialization?	2. How did Edwin L. Drake help industry to acquire larger quantities of oil?	3. How did the Bessemer process allow better use of iron ore?	4. What new uses for steel were developed at this time?

➔ Factor 2: Increasing Number of Inventions

5. How did Thomas Alva Edison contribute to this development?	6. How did George Westinghouse contribute to it?	7. How did Christopher Sholes contribute?	8. How did Alexander Graham Bell contribute?

➔ Factor 3: Expanding Urban Population

Provided markets for new inventions and industrial goods	Provided a ready supply of labor for industry

Name _____ Date _____

CHAPTER 6

Section 1

RETEACHING ACTIVITY

The Expansion of Industry

Matching

A. Match the following persons with their inventions or innovations.

_____ 1. William Le Baron Jenney	a. telephone
_____ 2. William Kelly	b. mass produced electricity
_____ 3. Thomas Alva Edison	c. steam engine oil drill
_____ 4. Alexander Graham Bell	d. typewriter
_____ 5. Christopher Sholes	e. steel-framed skyscraper
_____ 6. Edwin L. Drake	f. Bessemer process

Evaluating

B. Write *T* in the blank if the statement is true. If the statement is false, write *F* in the blank and then write the corrected statement on the line below.

_____ 1. The major factors of the nation's industrial boom were a wealth of natural resources, government support for business, and an abundance of farmland.

_____

_____ 2. Removing the carbon from iron produces a lighter, more flexible, and rust-resistant metal known as steel.

_____

_____ 3. Railroad companies, which sought to build thousands of miles of track, became the biggest customers for steel.

_____

____ 4. By 1910, women made up only 5 percent of the nation's clerical workforce.

_____

____ 5. The popularity of the automobile prompted entrepreneurs to transform more oil into kerosene.

_____

Name _____ Date _____

CHAPTER 6

Section 1

GEOGRAPHY APPLICATION: HUMAN–ENVIRONMENT INTERACTION

The Changing Labor Force

Directions: Read the paragraphs below and study the charts carefully. Then answer the questions that follow.

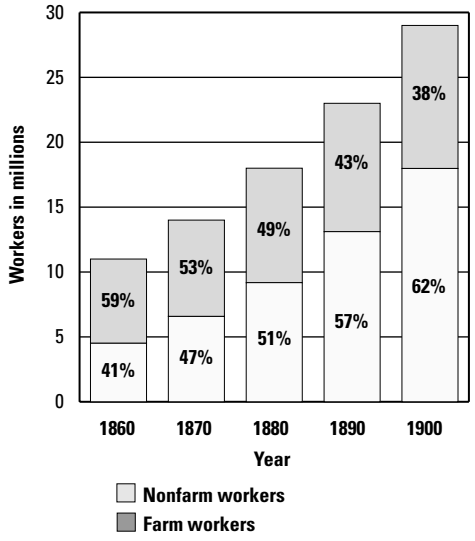
In 1859, the annual value of U.S. industrial production exceeded that of agricultural production for the first time. A shifting toward a predominantly urban population was occurring at the same time. This led to profound changes in occupations and income.

During the Civil War and immediately afterward, a broad spectrum of industries in the United States experienced incredible growth while fulfilling the product demands of the war and the expanding urban population. The increasing industrialization, though, brought grim working conditions. Employees often worked up to 12 hours a day, 6 days a week—with pay often less than $3 a day. Soon after 1870, industry over-expanded and over-produced, and wages fell.

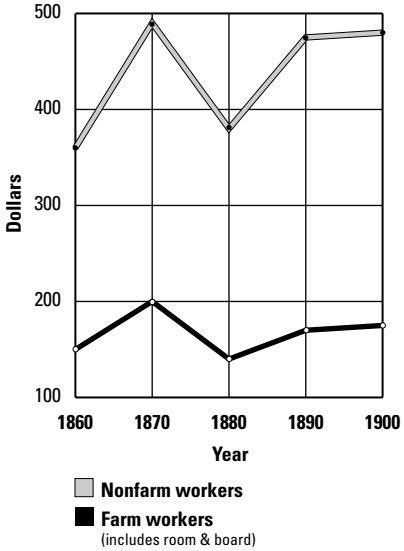
Those still working on farms also had their problems. New farm machinery reduced the number of farm workers needed, even though the number of farms increased during the period. Then, after farm production greatly increased, prices for crops such as cotton and corn dropped in the 1870s when output exceeded demand.

The graphs below show how these changes affected those who worked on farms and those who did not.

U.S. Farm and Nonfarm Workers, 1860–1900



Average Annual Income for Farm and Nonfarm Workers, 1860–1900



Interpreting Text and Visuals

1. About how many workers were there in the United States in 1860?

_____

2. What percentage of the American labor force were farm workers in 1860?

_____

3. About how many more farm workers were there in 1900 than in 1860? _____

Explain why the percentage was less in 1900. _____

_____

_____

4. In what decade did the percentage of nonfarm workers first exceed the percentage of farm workers? _____

What was the trend for the rest of the century? _____

_____

5. About how much did the average farm worker earn in 1860? _____

6. How much did the average nonfarm worker earn in 1860? _____

How much did he or she earn in 1900? _____

7. Explain what happened to wages during the 1870s. _____

_____

_____

_____

8. Contrast the trend in number of workers between 1890 and 1900 with the trend for the same time period in workers' income. _____

_____

_____

_____

Name _____ Date _____

CHAPTER 6
Section 1

PRIMARY SOURCE

The Birth of the Telephone

While conducting telegraph experiments, Alexander Graham Bell and his assistant, Thomas A. Watson, made an important discovery—the telephone. As you read Watson's account, consider the inspiration that led to the birth of the telephone.

On the afternoon of June 2, 1875, we were hard at work on the same old job, testing some modification of the instruments. Things were badly out of tune that afternoon in the hot garret, not only the instruments, but, I fancy, my enthusiasm and my temper, though Bell was as energetic as ever. I had charge of the transmitters as usual, setting them squealing one after the other, while Bell was retuning the receiver springs one by one, pressing them against his ear as I have described. One of the transmitter springs I was attending to stopped vibrating and I plucked it to start it again.

It didn't start and I kept on plucking it, when suddenly I heard a shout from Bell in the next room, and then out he came with a rush, demanding, "What did you do then? Don't change anything. Let me see!" I showed him. It was very simple. The make-and-break points of the transmitter spring I was trying to start had become welded together, so that when I snapped the spring the circuit had remained unbroken while that strip of magnetized steel by its vibration over the pole of its magnet, was generating that marvelous conception of Bell's—a current of electricity that varied in density within hearing distance of that spring.

That undulatory current had passed through the connecting wire to the distant receiver which, fortunately, was a mechanism that could transform the current back into an extremely faint echo of the sound of the vibrating spring that had generated it, but what was still more fortunate, the right man had that mechanism at his ear during that fleeting moment, and instantly recognized the transcendent importance of that faint sound thus electrically transmitted. The shout I heard and his excited rush into my room were the result of that recognition. The speaking telephone was born at that moment. Bell knew perfectly well that the mechanism that could transmit all the complex vibrations of one sound could do the same for any sound, even that of speech.

That experiment showed him that the complex apparatus he had thought would be needed to accomplish that long-dreamed result was not at all necessary, for here was an extremely simple mechanism operating in a perfectly obvious way, that could do it perfectly. All the experimenting that followed that discovery, up to the time the telephone was put into practical use was largely a matter of working out the details. . . .

You can well imagine that both our hearts were beating above the normal rate, while we were getting ready for the trial of the new instrument that evening. I got more satisfaction from the experiment than Mr. Bell did, for shout my best I could not make him hear me, but I could hear his voice and almost catch the words. I rushed upstairs and told him what I had heard. It was enough to show him that he was on the right track. . . .

It was not until the following March that I heard a complete and intelligible sentence. It made such an impression upon me that I wrote that first sentence in a book I have always preserved. The occasion had not been arranged and rehearsed as I suspect the sending of the first message over the Morse telegraph had been years before, for instead of that noble first telegraphic message—"What hath God Wrought?" the first message of the telephone was: "Mr. Watson, please come here, I want you." Perhaps, if Mr. Bell had realized that he was about to make a bit of history, he would have been prepared with a more sounding and interesting sentence.

from Richard B. Morris and James Woodress, eds., *Voices from America's Past*, Vol. 2, *Backwoods Democracy to World Power* (New York: Dutton, 1963), 219–221.

Research Options

1. Research the telephone's growth after Bell first exhibited it in public at the 1876 Philadelphia Centennial Exposition. Then prepare a brief oral report to share your findings.
2. Find a quote or saying that you think would have been a more "noble" first telephone message and share it with classmates.
3. Research Alexander Graham Bell's life. Write a brief biographical sketch and share it with the class.