26 Location and Manufacturing

STUDY GUIDE

By the end of this chapter, you will be able to:

- identify and describe location factors that influence manufacturers
- identify the patterns of manufacturing in Canada
- explain why a national pattern exists for different kinds of manufacturing
- use GIS to study the location of auto assembly plants and the reasons for their location

Key Terms

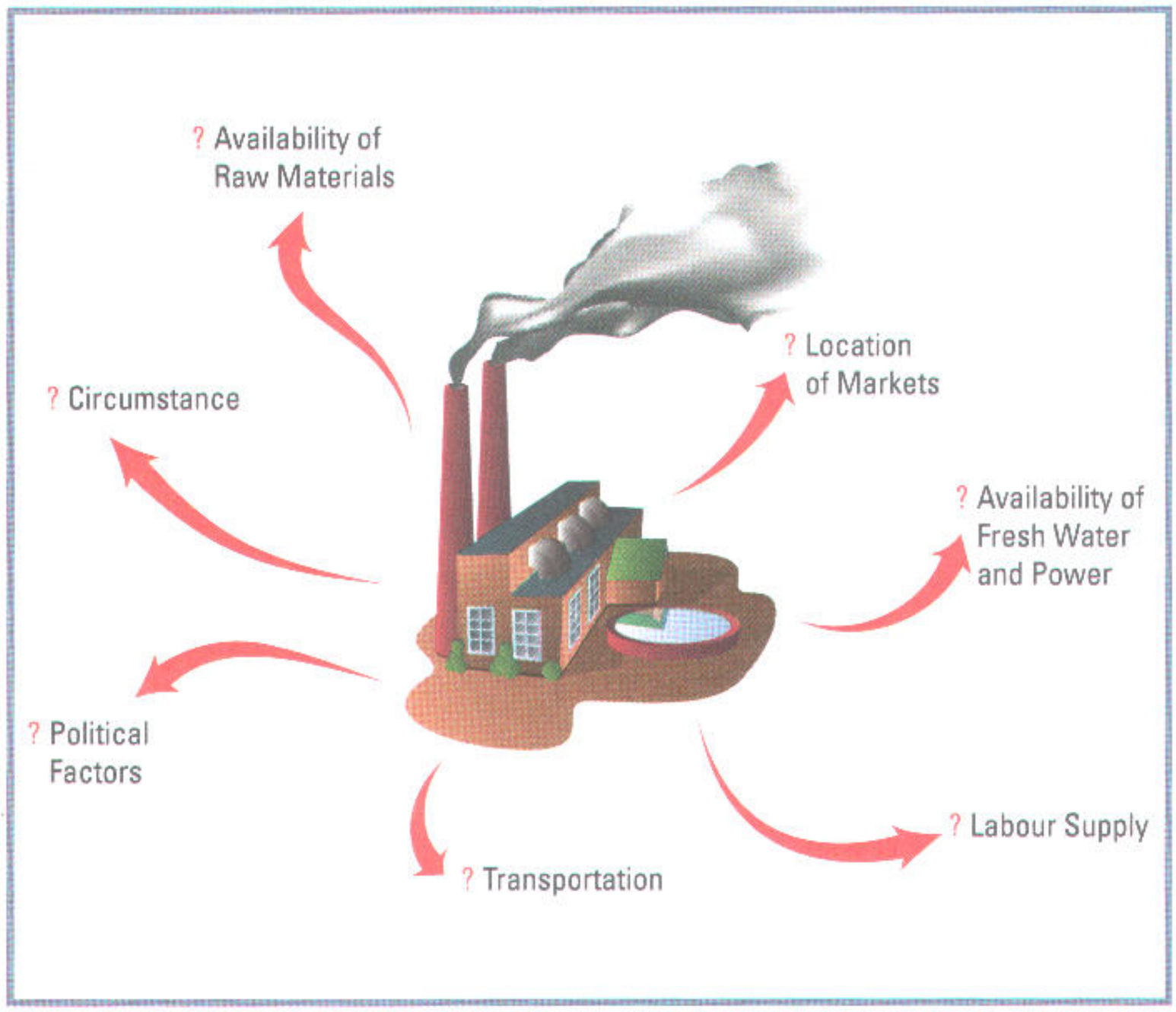
location factors
raw materials
market
labour supply
transportation
political decisions
circumstance
entrepreneur
fresh water and power
branch plant

When someone wants to start a new company, he or she must prepare a business plan, which is a detailed outline explaining why the company will be successful.. Imagine that you have decided to build a new factory and you must create a business plan; what factors would be important in determining the best location for your company in Canada?

1. Start by determining the product(s) your company will make. Choose from the following products, or create a product of your own: a commercial version of your mother's special spaghetti sauce, (what you hope will be) this year's must-have Christmas toy, or a new kind of wooden canoe paddle (Fig. 26-1).
2. Identify at least four location factors that you must consider when deciding where to build your factory.
3. Which of these factors would be most important for your company? Why?
4. Based on your answer to question 3, in which part of Canada would you choose to locate your factory? You may be able to get some of the information you need from an atlas. Why would you choose this location?

The bank will want to see your business plan before they loan you the $500 000 (or more) you need to get started.

△ Fig. 26-1



◁ **Fig. 26-2** *A number of factors affect the location of any factory. The relative importance of each varies, depending on the company.*

Some day, you may have to choose the location for a real manufacturing plant. For most companies, this is a tremendously important decision. In fact, the very survival of the company can depend on the success of this one decision. The location of any particular factory is influenced by a unique set of circumstances, such as the presence of a special raw material or the location of customers. There is a set of **location factors** that can be used to help us understand why manufacturers locate where they do (Fig. 26-2). In the section that follows, we will look at seven location factors and how they have influenced the location of specific companies in different parts of Canada. While all seven of these factors are likely to be involved in the location of just about any manufacturer, one (or perhaps two) of them is likely to dominate any particular location decision.

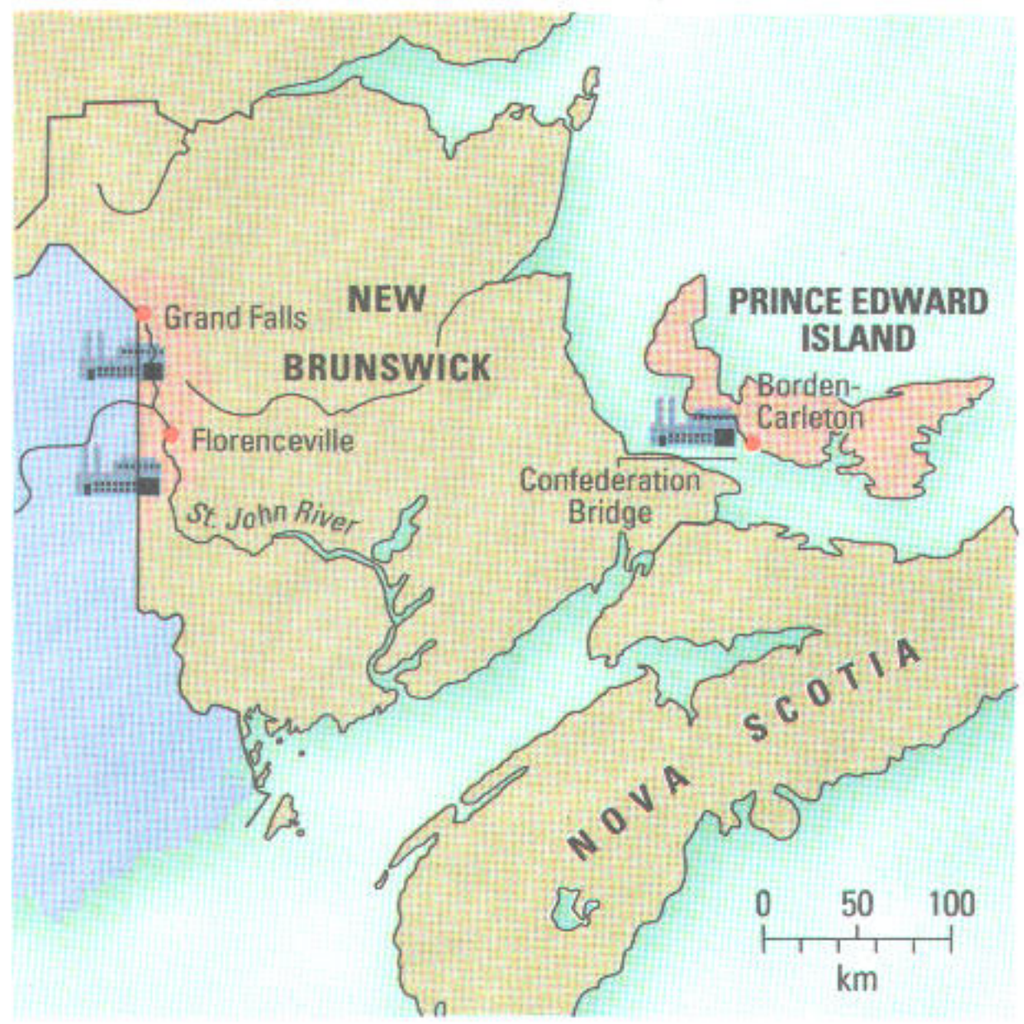
LOCATION FACTORS FOR MANUFACTURING

Availability of Raw Materials

Perhaps one of the easiest location factors to understand is the availability of **raw materials**. While any manufacturer needs a reliable source

of raw materials, for some companies, it is of extreme importance to locate near the raw material. For example:

- Fruits and vegetables should be processed as soon as possible after being picked, so food processing companies tend to be located in the areas where the crops are grown.
- Some factories, like sawmills, use great quantities of bulky raw materials and produce finished products that are much smaller. These companies tend to be located near the bulky raw materials, which are more difficult to transport.



△ **Fig. 26-3** *A tiny potato-processing plant in Florenceville, New Brunswick, has developed into a major international corporation with plants in both Canada and abroad.*

This map shows the potato growing areas of New Brunswick and Prince Edward Island, along with McCain's maritime processing plants.

McCAIN FOODS (CANADA)

Just about every Canadian is familiar with the frozen French fries and related products produced by McCain. McCain Foods is a Canadian company, which operates in Canada and in countries as far away as New Zealand, Poland, and Argentina. It employs more than 16 000 people worldwide and has annual sales of more than $5 billion (1998). This huge company can trace its history back to the potato fields of the upper Saint John River valley and to its first potato processing plant, which opened in 1957 (Fig. 26-3). This factory was built in Florenceville, New Brunswick, which is still the international headquarters. McCain Foods (Canada) has four factories that process potatoes in Canada. They are located in Florenceville and Grand Falls (New Brunswick), Borden-Carleton (Prince Edward Island), and Portage la Prairie (Manitoba). In each case, these factories are located in a major potato-growing area.

You can get more information about McCain Foods at www.mccain.com

Location of Markets

Often, a company will choose to establish itself in an area because the majority of its customers, or **market**, is located nearby. This is not surprising if you consider that being situated close to customers has clear advantages. For example, delivery costs are minimized. Also, a company that is near its customers can deliver its products in the minimum time possible. Both of these benefits would give a company an advantage over competitors that are located further away.

You might ask why all companies do not locate close to their customers. In fact, most companies will locate near their markets unless there is a very good reason not to. For example:

- A company's customers may be spread all over the country (or the world), so it does not matter where the factory is located. For instance, a company that makes hockey equipment might have customers in countries like Japan and Germany, among others.
- Other location factors may be more important than having nearby markets. This would be the case with McCain Foods.

CARDIUM TOOL SERVICES

While the products of McCain Foods are very well-known to most people, this is not the case for Cardium Tool Services of Edmonton. Cardium Tool Services makes products like *tubing anchor catchers* and *critical service tandem cone hydraulic liner hangar assemblies*. To people in the oil drilling and production industries, these are vital products that allow oil and gas to be produced efficiently and safely. Cardium started in 1954, only seven years after the first major discovery of oil in western Canada at Leduc, Alberta. Edmonton was an obvious choice for the company, since it is the largest city near Alberta's oil fields. Being close to the customers in the oil fields is an important consideration, especially if those customers experience an emergency and need a critical part right away. This need to be close to the market is reflected by the location of the company's branches in important oil-producing countries like the United Arab Emirates, Indonesia, and Venezuela.

More information about Cardium Tool Services is available at www.cardium.com

Availability of Fresh Water and Power

One of the basic needs for most kinds of manufacturing is an abundant supply of fresh water and power. Many manufacturing companies, like steel makers and oil refiners, use vast amounts of fresh water for cooling and cleaning purposes. As a result, companies in these fields must locate near major lakes and rivers. In pioneer days, flowing water was used to power the machinery in sawmills and grist (grain) mills. After the **Industrial Revolution**, other power sources came to replace water power. Perhaps the most significant power source for determining industrial location, is cheap hydro-electricity.

The production of hydro-electricity is discussed in Chapter 25.

ALCAN ALUMINIUM

Producing one tonne of aluminum requires the use of 13 500 kWh of electricity. This much electricity would keep a

The company uses the British spelling of *aluminum* in its name.

stereo system operating 24 hours a day for more than 50 years. Since one large smelter may produce more than 200 000 tonnes of aluminum per year, it is easy to understand why aluminum smelters are built only in places where electricity is readily and cheaply available. In fact, no other industry relies on the location of cheap power as much as the aluminum industry.

More information on Alcan is available at www.alcan.com

Canada's largest producer of aluminum is Alcan. Alcan is one of Canada's largest companies. In 1997, its production in Canada and other countries was worth almost US$8 billion and the company employed about 33 000 people. Alcan has four smelters in the Saguenay River Valley, in Québec, that will produce more than one million tonnes per year of aluminum by 2002. These smelters are powered by six, company-owned, hydro-electric plants on the nearby Saguenay and Peribonka Rivers. These mills sell to customers in eastern North America, Europe, and the Middle East. Alcan's mill in Kitimat, British Columbia, sells to customers in western North America and Asia.

Why do you think this smelter was located here?

Labour Supply

A company must consider the availability and cost of its **labour supply** when deciding where to locate. In the past, many companies needed a large, low-cost labour force. This was frequently the case in industries like clothing manufacturing. Since the signing of the NAFTA, it has been difficult for Canada to effectively compete with Mexico and parts of the United States in industries that employ low-cost labour; therefore, that type of manufacturing is not as prevalent in this country. Companies in Canada are much more likely to need workers with advanced skills. As a result, manufacturers tend to locate in parts of the country which have the universities, colleges, and apprenticeship programs that produce the workers they need.

The impact of the North American Free Trade Agreement is discussed in Chapter 32.

NORTEL NETWORKS

The **research and development** (R and D) branch of Nortel Networks in Ottawa illustrates the need for skilled labour better than perhaps any other company in the country. More than 8000 scientists, engineers, designers, and support staff work here, in Canada's largest R and D facility, to develop future generations of telecommunications networks. One statistic serves to illustrate how important skilled labour is to this company — Nortel hires three out of every five Ph.D. graduates in electrical engineering from Canadian universities.

You can learn more about Nortel Networks at www.nortel.com

Transportation

Every company needs fast and efficient **transportation**. For example, Cardium Tool Services uses air freight from the Edmonton airport to ship rush orders around the world, while Alcan ships bulk orders of aluminum to Europe by freighter. For some companies though, transportation is the most important location factor of all. For example, the two large steel mills in Hamilton are located in that city to take advantage of raw materials that are brought by ship; this includes coal from American ports along Lake Erie and iron ore from ports on the lower St. Lawrence River.

More information on Dow Chemicals is available at www.dow.com

More information about Sarnia, Ontario, can be found in Chapter 18.

DOW CHEMICALS OF CANADA

Dow Chemicals of Canada employs about 700 workers in Sarnia, Ontario and makes a variety of products like plastics, epoxy resins, and latex. The raw material for making these products is crude oil from Alberta. This oil is carried to Sarnia by the 2000 km-long Interprovincial Pipeline. Without the pipeline, it is hard to imagine that Dow's Sarnia operation would be as large as it is.

Political Factors

One way for a government to attract and keep industry is to provide a good business climate. This can be often achieved through **political decisions**. Governments can make decisions that will help to attract new business or, if they are not careful, that will drive investment away. Two types of government decisions can affect the willingness of a company to locate in an area: direct and indirect. Governments at all levels can make direct decisions to encourage a company to locate in their jurisdiction. For example, they might offer a company reduced taxes for a number of years or provide the land for a new factory. Indirect decisions can also be important. A good example of this would be the impact of a new highway through the greater Toronto region. Highway 407 allows manufacturers (particularly in the auto industry) to move raw materials and finished products quickly and to avoid other highways in the region that are often congested. Auto-assembly and parts companies would be more likely to locate (or expand) in the area facilitated by this highway because they could be confident that deliveries could be made on time; this is of critical importance in the auto industry.

You can find more information about Toyota at www.toyota.ca

TOYOTA MOTORS MANUFACTURING CANADA

In the mid-1980s, the Japanese auto maker Toyota decided that it wanted to expand its North American operations by building a

◁ **Fig. 26-4** *Newspaper headlines like this one, announced Toyota's decision to locate a new plant in Cambridge, Ontario.*

new assembly plant. It is not hard to understand why every town and city in Canada and the United States would want this new factory. Auto-assembly plants provide many secure, high-paying jobs. They also tend to attract other companies (parts manufacturers, for example) to locate in the same area (Fig. 26-4). The Ontario and local governments provided incentives to Toyota to encourage them to locate in Cambridge. One of the reasons why governments are willing to offer short-term benefits to a company locating in an area is that the benefits of the factory will last for many years and that future expansion in the same area is possible. This is exactly what happened with Toyota. Partly because of government subsidies and incentives, Toyota opened a plant in Cambridge, Ontario, in 1988. The factory employed 1000 workers and was designed to build 50 000 cars per year. Since then, employment has grown to more than 2000 and the plant now builds more than 200 000 cars per year.

Circumstance

The location factors mentioned so far are all quite specific and refer to the particular needs of industry, such as market, labour, and transportation. Beyond this, though, there are many other influences on the location of factories that are more general and difficult to measure. One of these is the role of the **entrepreneur**. An entrepreneur is someone who sees the sales potential for a new business and then works to develop that potential. For example, there were many people who could have seen the potential demand for frozen French fries or the snowmobile, but only a few individuals actually did something about it. The people who did, the McCain brothers and J-Armand Bombardier, started tiny companies in their home towns; they had no idea that some day these companies

would grow to become huge multi-national corporations with large factories in various areas.

A similar **circumstance** (some people would call it an accident) occurred as a result of Nortel Networks' presence in Ottawa. A number of high-tech companies in the Ottawa area, like Corel and Newbridge Networks, were started by scientists who used to work for Nortel. Not surprisingly, these companies are located in the Ottawa area because that is where these entrepreneurs lived.

The expansion of Toyota in Cambridge illustrates a different circumstance. Once a company has come to be established in one location, it is likely that further expansion will occur in the same area. When the Toyota factory more than doubled to 253 000 m^2 in 1997, no additional government subsidies were given, but for several reasons it just made sense to expand in this location rather than to build elsewhere.

A similar situation has occurred with the Canadian manufacturers that were established when Canada did not have free trade with the United States. During this time, it made economic sense for American companies to establish **branch plants** in Canada. These were relatively small, independent factories that were designed to meet the needs of the Canadian market. Many of our best known companies established branch plants in Canada, most often in southern Ontario and Québec. Examples of these are Ford of Canada, Canadian General Electric, and IBM of Canada. You can often identify these companies by their names — what pattern do you see? While these branch plants no longer have the advantage of **tariffs**, they remain among our most important factories. In some cases, they have even expanded to make products that will be sold in the United States.

More information on General Motors of Canada is available at www.gmcanada.com

GENERAL MOTORS OF CANADA

The location of General Motors in Oshawa illustrates the idea of circumstance very well. In the 1800s, a carriage-making business started in a small village northeast of Toronto. A number of years later, this small company moved to Oshawa. When the "new-fangled" horseless carriage, the car, appeared on the scene in the early 1900s, the company started to build automobiles. This occurred for a couple of reasons. One was the entrepreneurial nature of the company's founder, Sam McLaughlin, who saw the potential of the automobile and the limited future of the carriage. The other reason was that the carriage company had a factory, skilled workers, and capital to invest in the new venture. In relatively few years, the McLaughlin Carriage Company had become General Motors of Canada and the rest, as they say, is history. In July 1994, Maureen Kempston Darkes was appointed president and general manager of General Motors Canada, and vice-president of General Motors Corporation.

City	Value Added in Manufacturing ($ million)	Population (thousands)	Value Added in Manufacturing ($/person)
Calgary	2598	789	3293
Chicoutimi-Jonquière	1066	161	6621
Edmonton	3838	850	4515
Halifax	618	326	1896
Hamilton	4164	612	6804
Kitchener-Waterloo	3819	369	10 350
London	3079	390	7895
Montréal	20041	3180	6302
Ottawa-Hull	2010	965	2083
Québec	2013	660	3050
Regina	464	192	2417
St. Catharines-Niagara	2519	368	6845
St. John's	196	173	1133
Saint John	982	125	7856
Saskatoon	503	215	2340
Sherbrooke	484	143	3385
Sudbury	347	159	2182
Thunder Bay	651	125	5208
Toronto	27798	4588	6059
Trois-Rivières	719	138	5210
Vancouver	5795	1615	3588
Victoria	262	296	885
Windsor	3406	270	12 615
Winnipeg	2461	660	3729

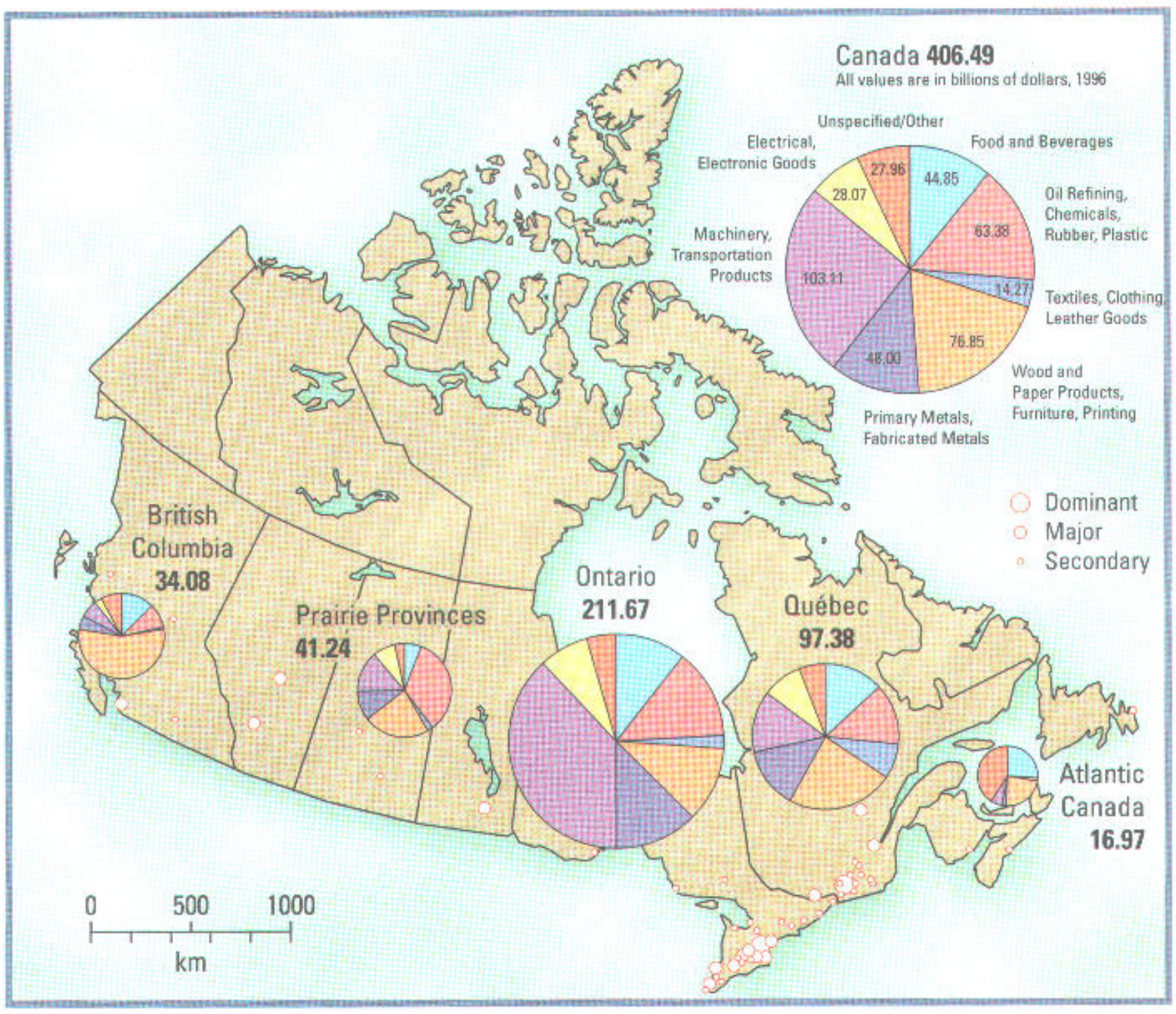
△ **Fig. 26-5** *Value added in manufacturing in Canada's major cities*

You now know the factors that affect where manufacturers locate. The next step is to investigate the pattern of manufacturing that exists in Canada. There are two aspects to this. One is how much manufacturing is done in each province. The other is where different kinds of manufacturing occur.

1. The vast majority of manufacturing occurs in cities, so that is where we will concentrate our attention. Fig. 26-5 shows the population of Canada's 24 largest cities and the value added by manufacturing in those cities.

"Value added" is the difference between the cost of the raw materials and the labour that go into manufacturing and the value of the final products.

2. Locate and plot each city on an ecozone map of Canada. Use one symbol to mark all cities with a *per capita value added* greater than $5000 and a different one to mark those with a value less than $5000. In what ecozones are the high *per capita value added* cities?
3. Review the location factors above and explain why so much manufacturing occurs in such a small area.
4. Look at the kinds of manufacturing that occur in different parts of Canada (Fig. 26-6).
   a) Rank the seven major categories of manufacturing (Do not include "Unspecified/Other").
   b) Give three examples of the products that each type produces.
   c) Name a company that belongs to each category.
5. Compare the national pattern of manufacturing to that of each major region. For each region, identify one (or two) type(s) of manufacturing that is significantly more important in that region than in the country as a whole. (Do not include "Unspecified/Other")
6. Use your understanding of location factors to explain why this pattern exists.



◁ **Fig. 26-6** *Map of manufacturing in Canada. The "Unspecified" category includes: types of industry not included in the "Other" category, and industries which cannot be specified due to Statistics Canada confidentiality rules.*

CANADA'S AUTO INDUSTRY

Canada's auto-making industry is of such great importance to our economy, that it deserves a special look. In terms of dollar value, cars, light trucks, and auto parts are our most important manufactured products and, by far, our most important export. There are a number of reasons for this. It all started with the Auto Pact, a trade agreement signed with the United States in the 1960s that required a minimum number of cars to be built in Canada. Canada proved to be a good place to build cars for both the American Big Three car companies (General Motors, Ford, and Chrysler) and for Japanese manufacturers (Toyota, Honda, and Suzuki). Canadian workers produced very high quality cars at a competitive price. As a result, in recent years, a number of additional assembly plants have been built and existing plants have been expanded.

GIS activity: You will have the opportunity to learn where auto-assembly plants are located and the reasons for their locations. Your teacher will give you detailed instructions.

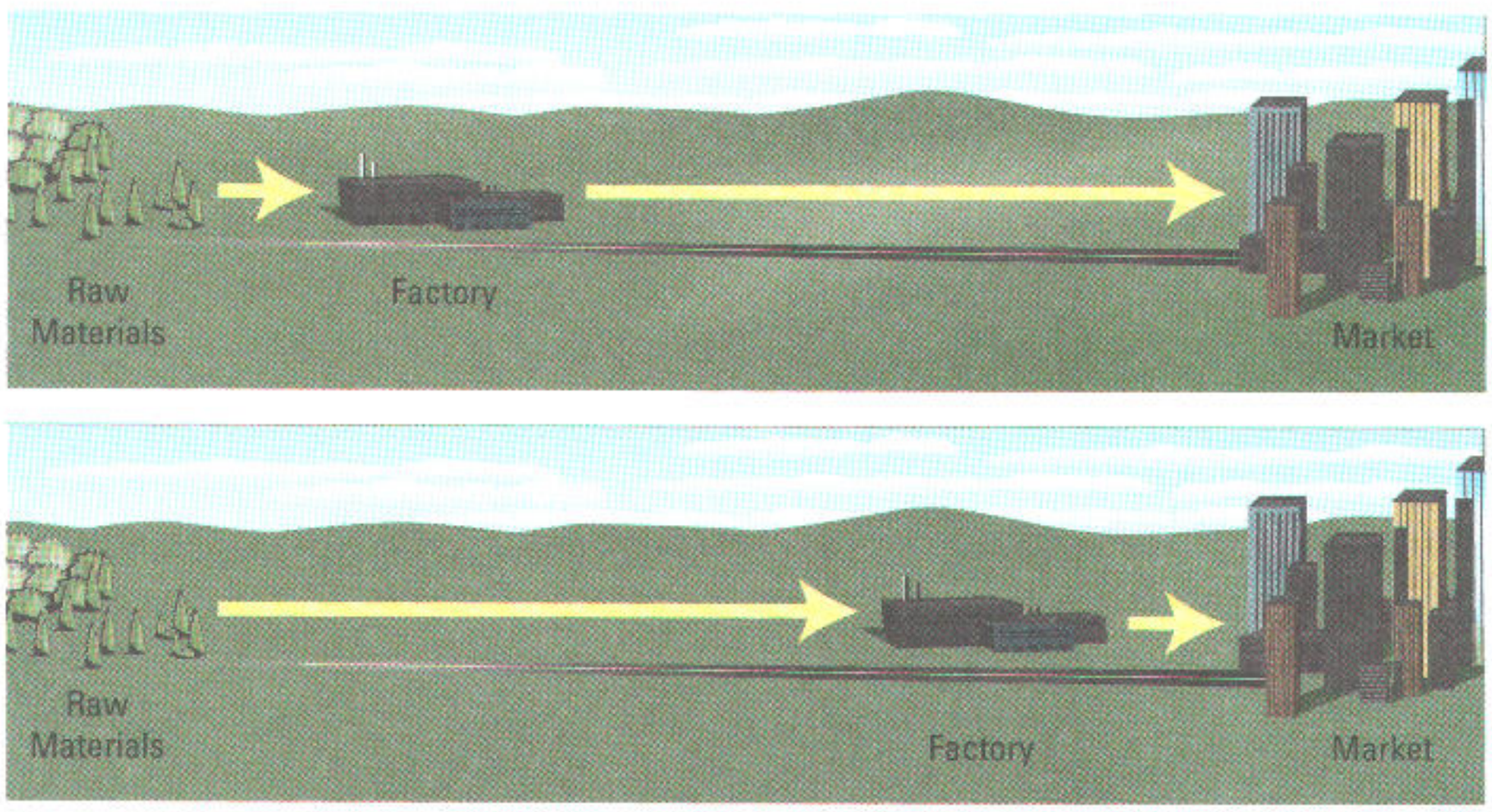
QUESTIONS

CHECK YOUR UNDERSTANDING

1. a) What is a location factor?
   b) Name each of the location factors mentioned in this chapter and briefly explain each in your own words.
2. a) What is an entrepreneur?
   b) What role do entrepreneurs play in deciding where factories are located?

ANALYZE AND APPLY

3. Some factories tend to be located close to raw materials and far from markets, while others are far from raw materials and close to markets (Fig. 26-7). Give two examples of each type of factory and explain why they locate where they do.
4. Compare the customers for the products made by Cardium Tool Services and McCain. How do these different types of customers affect the location of each company?



◁ Fig. 26-7

THINK AND COMMUNICATE

5. a) How has the labour supply situation in Canadian manufacturing changed in recent years? Why?
   b) How do you think this change should affect your educational plans?
6. a) List three reasons why a company would be more likely to expand in its current location than to build in a new location.
   b) List three reasons why a company might decide to build a new factory in a different area rather than to expand an existing operation.
   c) Compare your answers to 6a and 6b. Is it possible to say which choice would be made in all cases ?
7. a) What is a branch plant? Name four branch plant companies that were not named in this chapter.
   b) How have the original advantages of branch plants come to be replaced by different advantages? Is the new location factor likely to be more significant than the original one?

ATI Graphics

It is a tradition in most Canadian geography textbooks to include a case study about a major manufacturer. Almost always, these studies have concentrated on steel-making, auto-assembly, or oil-refining; these are examples of what are called **smokestack industries**. These are the traditional, resource-based kinds of manufacturing that have been the basis of Canada's economy in the 20th century. This Connecting Study, on the other hand, looks at one of the **knowledge industries** that are becoming the dominant type of manufacturing for the 21st century.

You may not have heard of ATI Graphics, but if you use computers it is very likely that you have used their products. ATI does not make computers, but it does make some of the most important parts of the computer — those that produce the vivid two-dimensional (2-D) and three-dimensional (3-D) graphic images that we actually see on our computer screen. In fact, ATI is the largest manufacturer in the world of 3-D and multimedia computer chips and graphics boards. ATI plans to continue its phenomenal growth, which gave it more than $1 billion dollars in sales in 1998 and made it Canada's third largest high-tech company only 13 years after its founding.

ATI has its headquarters in Thornhill, Ontario, which is one of the northern suburbs of Toronto. About 800 of their 1600 employees work here, with the others at ATI offices and factories in the United States, Germany, France, the United Kingdom, Ireland, Barbados, Malaysia, Hong Kong, and Japan.

KEY TERMS

- smokestack industries
- knowledge industries
- tandem engineering

ATI is the third largest high-tech company after Nortel and Newbridge Networks. Note that statistical references in this chapter refer to 1998, unless otherwise indicated.

ATI'S HISTORY

ATI was founded by Kwok Yuen (K.Y.) Ho and two associates. Mr. Ho is an electrical engineer from Taiwan. After he graduated from university in 1974, he worked for approximately 10 years learning about the computer industry. In 1984, he came to Canada as a visitor and liked what he saw — wide open spaces and business opportunities. When he returned to Taiwan, he decided to come back to Canada and start a business in the poorly developed computer-graphic hardware industry.

LOCATION FACTORS AND ATI

In the manufacturing chapter, you were told that a good way to study a company's operation is by examining how location factors affect it. The following is an examination of how location factors have affected ATI.

Availability of Raw Materials

Unlike a steel mill or oil refinery, the transport of large quantities of raw materials is not very important to a company like ATI. The raw materials they need are easily brought by air freight from anywhere in the world to their two manufacturing facilities in Thornhill and Taiwan. Access to raw materials is not a significant factor in the location of this company.

Location of Markets

ATI sells its graphics boards and chips to two kinds of markets. From the beginning of the company's history, ATI has sold to original equipment manufacturers (OEMs). These are companies that make computers, for example, Apple, Compaq, and Dell. In fact, ATI sells to all ten of the largest computer makers in the world, along with many smaller ones. More recently, ATI has sold an increasing percentage of their products to individual consumers through computer stores of various types. Both markets are found across the world, with about 35% in North America, 27% in Europe, and most of the rest in Asia. For ATI, being close to markets is not a very important location factor.

Because graphics boards are improving so rapidly, computer users are now much more likely to upgrade their computer's graphical capability between computer purchases.

Availability of Power and Fresh Water

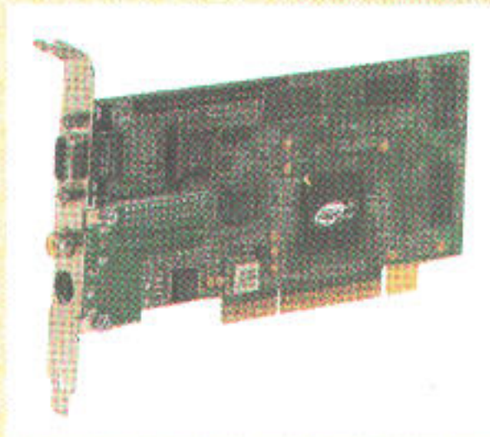
ATI does not use particularly large amounts of electricity and fresh water. Normal municipal sources of these are adequate. This is another factor that is not important to ATI's location.

Labour Supply

When Mr. Ho visited Canada in 1984, one of the things that impressed him (other than the scenery) was the availability of skilled engineers and scientists. ATI's success depends on its ability to be ahead of its competitors technologically, in order to meet the growing needs of its customers in the absolute minimum time possible. It achieves this in several different ways:

- by spending a great deal of money on research and development — more than $100 million in 1998, which was almost 9% of the value of their total sales. This is much more than most companies would spend.
- by using **tandem engineering**, which substantially speeds up the process of getting new products to market. This type of engineering allows two or more engineering teams to work on a product and the next generation(s) of that product simultaneously. In 1993, before tandem engineering began, a new generation of graphics hardware would take 12 to 18 months from the research and development stage to the manufacturing stage. Now, this takes only 6 to 8 months. Tandem engineering, however, does require a greater number of engineers.
- by making both chips and circuit boards. This means that they avoid the limitations of generic (Fig. 26-8) "off-the-shelf" chips. Making both chips and boards requires a large, highly skilled labour force.

Clearly, being able to find enough workers with the right skills remains of critical importance to ATI's success. Its location in southern Ontario, near so many universities and colleges and a large, skilled labour-force, gives it the best chance to meet its labour needs.



△ **Fig. 26-8** *ATI must always be on the cutting edge of computer graphics hardware. This means new generations of graphics boards come on the market every six to eight months.*

Computer chips are either designed for a special purpose or for more general use. Companies that build boards, but do not make their own chips, may find that they cannot build boards that will do exactly what they want.

Transportation

Air transport is important to ATI for two reasons. Its raw materials and finished products are small in volume, light in weight, high in value, and must be shipped quickly to their destinations. As a result, almost everything ATI needs or produces is shipped by air. Air transport is used for business travel as well. ATI executives frequently visit customers and suppliers all over the world, and, customers and suppliers often visit ATI's offices.

ATI uses the facilities of Pearson International Airport in Toronto for moving both people and freight. Having ready access to efficient air transport facilities is a significant factor in ATI's location.

Political Factors

In its early history, ATI received financial assistance and advice from the Canadian Export Development Corporation.

Circumstance

Circumstance has played a significant role in ATI's location. Think about the company's founding, and imagine what might have happened if Mr. Ho had

decided to take his vacation in the United States or Australia. ATI might be a similar company, but it could be located in Boston or Melbourne!

Much of ATI's success and growth is tied to the entrepreneurial abilities of its founders. In fact, Mr. Ho was selected by *Canadian Business* magazine as Canada's entrepreneur of the year for 1998. It is easy to relate ATI's success to its technological advancement. Less obvious, is the role that customer service has played in this success. ATI has always made it a priority to work closely with its customers. This aspect of entrepreneurship has contributed much to the company's growth.

ATI's founders were recent immigrants to Canada from East Asia. The great majority of Asian immigrants settle in either Toronto or Vancouver, so it is not surprising that ATI was built in one of these cities. It is located in a suburb of Toronto that has a significant number of large and small high-tech companies. If this district of technology-based companies had not been there, ATI might have located in a different part of the city.

CHALLENGES FACING ATI

ATI faces an exciting future, but it does face some serious challenges. The computer graphics field continues to grow at a very rapid rate. ATI is starting to develop new markets for its products that are outside the traditional computer field. For example, they now make digital cable television terminal boxes. These boxes are a step toward the gradual elimination of the division of television and computers into two isolated technologies. In the future, if ATI and others are correct, you will have a television that you can use as a computer, or vice versa. By being a pioneer in this new field, ATI hopes to become a dominant player in a huge new market.

Cable television companies are gradually changing from using analog signals to digital signals. This change opens a whole new market to ATI (and its competition).

In spite of all of this, ATI faces a number of problems for the future, some coming as a result of the company's success. If your company has been extraordinarily successful, investors expect you to continue this rate of success. Growth in sales and profits must occur at a rate that is far beyond what is expected of most other companies. If ATI were only to achieve the kind of results that are typical of average companies, this might be seen as a problem, and investors might not want to provide the large amounts of money that ATI would need to expand. A second problem that comes from success is that ATI is an attractive takeover target for other, larger companies who want both ATI's share of the market and, more importantly, ATI's advanced technology. A final problem is the unpredictable nature of the high-tech business world. Make a right decision today, and you can make millions of dollars in just a few months. Make a wrong decision tomorrow, or have a competitor make a big breakthrough, and you can lose your market share and your millions just as quickly.

You can learn more about ATI Graphics at www.atitech.com

QUESTIONS

CHECK YOUR UNDERSTANDING

1. a) What kinds of products does ATI produce?
   b) How will ATI's products change in the years to come?
   c) Are you an ATI customer? How would you know?
2. Briefly describe how ATI came into being and how it became a major high-tech company.

ANALYZE AND APPLY

3. a) What is a smokestack industry? What is a knowledge industry?
   b) Complete an organizer like the one in Fig. 26-9 to compare the two.
4. a) In what ways is ATI a typical manufacturing company?
   b) In what ways is ATI not typical?
5. From the point-of-view of ATI, why is it desirable that the graphics ability of computers improves faster than other aspects of the computer's power?

THINK AND COMMUNICATE

6. Answer this question with a partner. Your teacher will give you the name of a manufacturing company to investigate. Study your company to determine how it has been affected by the seven location factors. Create a poster to illustrate your findings. Find out about your company by:
   - writing to the company's public relations department
   - checking the company's Web pages on the Internet
   - looking for newspaper and magazine stories about the company
   - phoning to arrange a visit to the company

▽ Fig. 26-9

	Smokestack Industry	Knowledge Industry
Four Examples		
Basis of Industry		
Time Period of Economic Importance		

27 Providing Services

STUDY GUIDE

By the end of this chapter, you will be able to:

- explain how tertiary industries differ from primary and secondary industries
- explain the differences between basic and non-basic industries
- examine future trends for tertiary industries
- conduct a job search in the tertiary sector of the economy

Key Terms

tertiary industries	non-basic services	wholesale	entrepreneur
basic services	trade	retail	call centre

Workers who hold jobs in the **tertiary industries** provide **services** to people. They do not manufacture products, or exploit the natural environment. They supply services to the general public. They also support workers in the primary and secondary industries. For example, a meteorologist supplies weather reports to fishers, and office personnel prepare the pay cheques of factory workers. The number of service jobs has increased tremendously as businesses and governments have become more complex. Today, almost 75% of Canadians are employed in tertiary industries.

Wherever there is a community, there are people working in service activities. Communities require services in education, health care, planning and management, communications, transportation, sanitation, law enforcement, and road maintenance, among others. Most services are visible. In other words, we can actually see people making daily use of them. Other services, such as computer-related activities, planning and management decisions, scientific research, and communications, may be less visible, although they directly affect our lives. Service activities are carried out all across the country, and are required by Canadians in order to live their daily lives.

Sometimes, information-based services are called quarternary industries.

1. Class members should list the jobs of parents/guardians who are employed outside the home on the board.
2. a) Within a group assigned by your teacher, categorize the jobs under the headings Primary, Secondary, and Tertiary.
   b) Calculate the percentage of parents/guardians in each of the three categories.
   c) Compare your percentages with the percentage of employment in primary, secondary, and tertiary industries in Fig. 20-4 on p. 243.
   d) How do your percentages compare to the national percentages? Explain why differences may exist.

DEVELOPMENT OF THE SERVICE SECTOR

The number of Canadians employed in service industries has grown tremendously. In 1901, only about 33% of Canadian workers were employed in services; now the figure is close to 75% (Fig. 27-1). Why has the tertiary sector of Canada's economy grown so large? Consider the following:

- Throughout the 1900s, greater use of machinery in farming, mining, forestry, and manufacturing increased productivity and revenue. As a result, workers received more money, and enjoyed more leisure time. This improved Canada's standard of living, and gave rise to a greater demand for services.
- Greater educational opportunities have helped people obtain the specialized skills which enable them to offer services to others.
- A growing population has increased the demand for services.
- Complex technology, particularly in the provision and storage of information, has given rise to a wide variety of services.

BASIC AND NON-BASIC SERVICES

Service industries may be classified into two categories: **basic services** and **non-basic services**. Basic industries provide services to people and business outside the community. They bring money into their respective communities from the outside, and without them, communities could not survive. For example:

- The federal government in Ottawa provides services for Canadians throughout the country.
- A university attracts students from outside the community in which it is located.
- An insurance company head office performs services for customers in other parts of Canada, or in other countries.

Tertiary Sector	1996
Wholesale & retail trade	17.2%
Transportation & communication	6.4%
Finance, insurance, real estate	5.5%
Education	6.9%
Healthcare and social services	10.4%
Business and personal services	21.8%
Government services	5.5%
Total	**73.7%**

◁ **Fig. 27-1** *The percentage of Canadian workers who are employed in the tertiary sector*

Non-basic industries provide services for people and businesses located within the community. Non-basic services do not generate money from outside sources. Think of some of the services you use in your community: public transportation, your high school, your doctor and dentist, or the local movie theatres. You pay for these services, either directly or through your taxes, and the money stays within your community.

TERTIARY INDUSTRIES

Trade Services

The selling of goods is called **trade**. Trade is divided into two categories:

Wholesale — the selling of goods and services to businesses or stores, not to the public.

Retail — the selling of products and services directly to the public in stores, vending machines, over the telephone, through mail-order, door-to-door sales, or over the Internet.

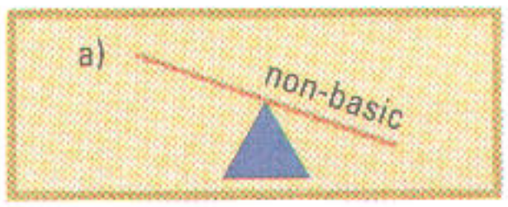
Sample Occupations

warehouse worker, inventory clerk, merchant, telemarketer, sales representative, cashier, Internet order-taker, lift-truck operator

Basic or Non-Basic?

- Wholesale: mostly basic, e.g., a large Canadian Tire warehouse in Brampton, Ontario supplies stores in much of Canada
- Retail: mostly non-basic because it serves the local area

The balance of basic and non-basic activities indicated for each industry is a general guideline and will vary in each region, depending on the nature of that community.



Finance, Insurance, and Real Estate Services

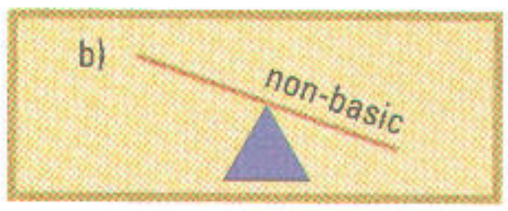
This includes services provided by banks, trust companies, credit unions, stock exchanges, insurance companies, and real estate companies. These institutions range in size from local real estate offices, to the head offices of huge insurance companies and banks doing business all across Canada and throughout the world.

Sample Occupations

bank clerk, investment manager, insurance agent, real-estate agent, stock-broker, secretary, credit investigator, financial planner

Basic or Non-Basic?

- It could be both, e.g., people working in the head office of a bank would be basic while those working in a local branch would be non-basic.



Business and Personal Services

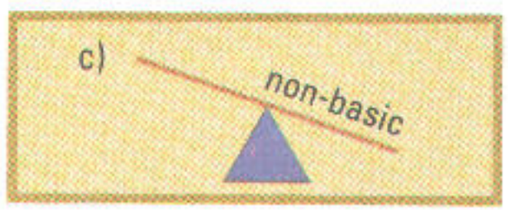
This is the largest category of tertiary industry and supplies the services needed by businesses and individual Canadians. It is the fastest growing employment area in the economy.

Sample Occupations

accountant, mechanic, hairdresser, lawyer, secretary, personal fitness trainer, server, lifeguard, copywriter

Basic or Non-Basic?

- Most business and personal activities are local, so they are considered non-basic, e.g., a lawyer who specializes in local real estate or criminal matters.
- Services provided for companies and people outside the city are considered basic activities, e.g., a lawyer who works on international trade issues.



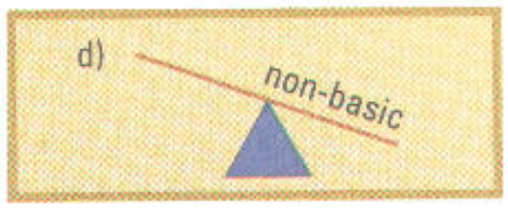
Transportation and Communication Services

These services involve the movement of goods, people, and information.

Sample Occupations
truck driver, bus driver, air traffic controller, railway engineer, journalist, radio announcer, cable television installer

Basic or Non-Basic?

- Can be both, e.g., an airline pilot would be basic while a bus driver would be non-basic.



Government Services

Federal, provincial, and municipal governments offer a wide variety of services. For example:

Federal: postal service, defense, and Native affairs

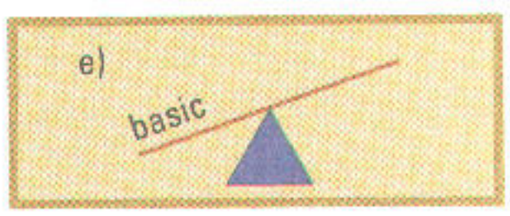
Provincial: health and social services, education, and natural resources

Municipal: police and fire protection, water and sewage services, and parks and recreation

Sample Occupations
politician, park ranger, jail guard, postal employee, economist, social worker, fire fighter, park maintenance worker

Basic or Non-Basic?

- Federal and provincial governments: mainly basic
- Municipal services: almost always non-basic



Healthcare and Social Services

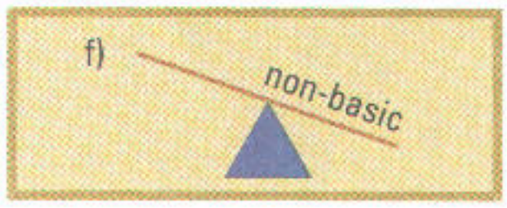
Healthcare services include dental care and medical care and research. Social services include day-care centres, shelters for the homeless and those escaping from violent situations, lunch programs for underpriviledged children, and visits by social workers to families in need of counselling.

Sample Occupations

doctor, nurse, dietitian, X-ray technician, physiotherapist, psychiatrist, medical researcher, social worker, psychologist

Basic or Non-Basic?

- Most are non-basic because they serve the local community, e.g., hospitals, doctor's offices, visitations by social workers and nurses
- Some are both because they are specialized and service local as well as non-local people, e.g., cancer treatment centres.



Education Services

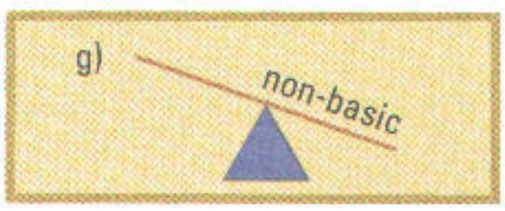
Education services include elementary and secondary schools, post-secondary education (universities and colleges), vocational training, religious training, and English or French language instruction for new Canadians.

Sample Occupations

teacher, principal, secretary, custodian, professor, librarian, teachers' aide

Basic or Non-Basic?

- Elementary and secondary schools: non-basic because they provide services for the local community
- Universities and colleges: a mixture of both



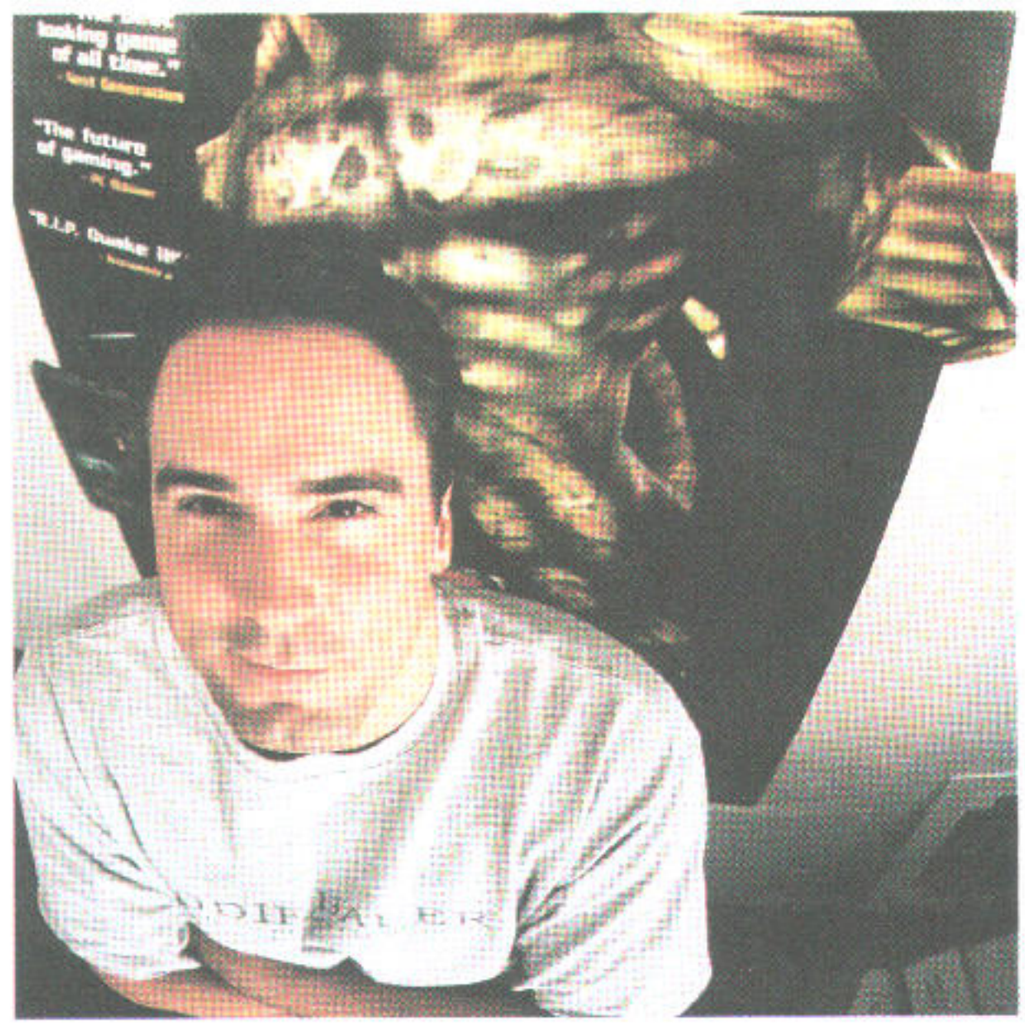
FUTURE TRENDS

What type of work will be available for you when you finish school? Chances are it will be in the services industry. Rapid changes are occuring in the workplace due to the globalization of the economy, free trade, and technological advances. These changes may eliminate jobs that we now take for granted, or they may provide you with new job opportunities.

globalization: companies buy and sell products in countries around the world

Today, young people can find employment in jobs that did not exist thirty years ago. Computer analysts, satellite broadcasting technicians, Internet-related workers, and personal trainers in fitness clubs are just some examples. What kinds of jobs will be created in the next 30 years? There is no way to tell, but we can make some informed guesses about the nature of employment in future service industries.

Growing numbers of young **entrepreneurs** will start their own businesses and most will be in the tertiary sector. Employment in small business is currently rising, and home-based enterprises are increasing. 25% percent of the small businesses in Canada are now owned by people aged 18 to 29. Some young people own businesses because they want to work for themselves; others go into business for themselves because they are unable to find permanent employment in established companies. An example of Canadian entrepreneurship is found in the field of electronic games. Canadian university graduates of computer and related programming courses are producing award-winning games with imaginative stories and innovative graphics (Fig. 27-3). They are making their mark in this growing, multi-billion dollar industry.



△ **Fig. 27-3** *Young Canadian entrepreneurs like James Schmalz are producing innovative electronic games. Are these creators of electronic games performing a basic or non-basic activity?*

Future growth is expected in jobs that offer services for seniors who are part of the aging "baby boom" generation. These are the people who were born between 1947 and 1966. Today, baby boomers make up about 33% of Canada's population. The needs of these "boomers" are changing as they age. They do not purchase as many manufactured goods as younger people because they already have most of the goods they need. What they need, however, are increased services in such areas as healthcare, travel, and finance.

Not only is the nature of jobs in the service industries undergoing change, but the jobs themselves are being eliminated by technology. Consider the following examples:

- Electronic home shopping could eliminate many jobs in retail sales.
- Touch-sensitive menu screens at fast food restaurants could replace the people who take orders.
- Fax machines, voice mail, and personal computers have reduced the number of secretaries in many offices.
- Electronic and telephone banking, as well as automated teller machines, are reducing the need for bank tellers.
- Communication technology is reducing the need for companies to be close to their customers. For example, companies such as the Royal Bank, CP Hotels, and Purolator locate their customer service operations in telephone **call centres** located in places like Moncton, New Brunswick, even though most of their customers are in other parts of Canada. By dialing a toll-free number,

customers can purchase or exchange a product, make a hotel reservation, register a complaint, or request information.

We can only speculate on the number and nature of jobs in the service industries of the future. One thing for certain is that new types of services will develop to meet the changing needs of Canadians.

Conduct a job search in the tertiary sector of the economy. There are jobs that involve working with people, working with information, and working with other things (Fig. 27-4).

1. What other types of jobs could be listed in each of these categories?
2. In which category (people, information, other things) are you most interested? Why?
3. a) Work with one or two other students who have an interest in the same job category.
   b) Work together to make a list of jobs about which you would like to learn more information.
   c) Create a series of questions that you would like answered for each job. For example:
      - How much education or training is required?
      - What types of activities are involved in this job?
      - What are the job prospects for the future?
      - What is the salary range?
4. Use a variety of sources to research these jobs. You may want to try
   - libraries (school and community)
   - school guidance department
   - career centres and employment offices in your community
   - job advertisements in newspapers
   - computer searches
   - career information programs such as *Choices* (CD ROM)

Jobs that Involve Working With:	
People	• healthcare worker • religious leader • social worker • sales representative
Information	• lawyer • writer • Web page designer • stockbroker
Other	• fashion designer • interior decorator • electrician • robotics expert

△ **Fig. 27-4** *Jobs in tertiary industries*

If you are interested in doing a search in the primary or secondary sectors of the economy instead, talk to your teacher or guidance/career counsellor

- Internet sources such as:
  - Job Futures:
    www.hrdc-drhc.gc.ca/JobFutures/english/index.htm
  - Work *Info*net:
    www.workinfonet.ca/cwn/english/main.html

5. Write descriptions of the jobs you researched, using the answers to the questions that your group created in question 3. Work in your group to create a jobs booklet, a job search bulletin board, or the classified section of a newspaper, using these descriptions.
6. What will your working future be like? Using words and diagrams, select one job that you researched and try to imagine what it would be like if you were to work at this job in the future. Consider such things as
   - the education, training, and skills you will need
   - activities involved in your job
   - responsibilities you would have
   - work location
     - downtown core of a city, a suburb, or at home
     - specific city or suburb
   - type of company
     - your own
     - large or small (explain why)
   - number of hours you will work per week

QUESTIONS

CHECK YOUR UNDERSTANDING

1. How do tertiary industries differ from primary and secondary industries?
2. Why has the tertiary sector of the Canadian economy grown so large?
3. a) Explain the differences between basic and non-basic service industries.
   b) For each service industry discussed in this chapter, explain how it may have basic and non-basic characteristics.

THINK AND COMMUNICATE

4. What types of service jobs do you think will decrease and which will increase in number over the next ten years? Explain.