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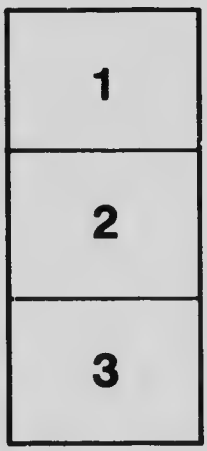

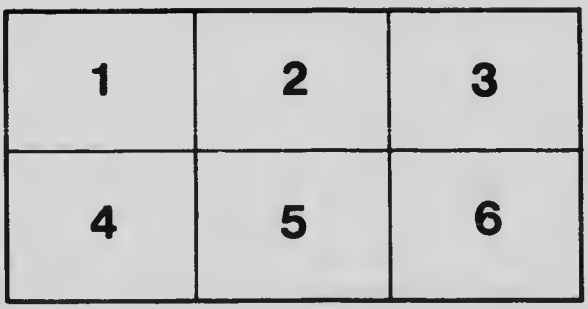

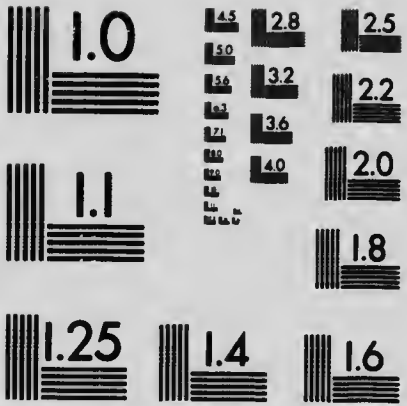

MORANG'S MODERN TEXT-BOOKS

TARR AND McMURRY'S GEOGRAPHIES

A COMPLETE GEOGRAPHY

EDITED BY

JOHN C. SAUL, M.A.

AUTHORIZED BY THE ADVISORY BOARD OF THE DEPARTMENT OF EDUCATION FOR USE IN THE PUBLIC SCHOOLS, HIGH SCHOOLS, AND COLLEGIATE INSTITUTES OF THE PROVINCE OF MANITOBA

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INTRODUCTORY NOTE

THE editor desires to acknowledge in the most cordial terms assistance received in the preparation of this book from Mr. Alexander McIntyre, B.A., Vice-Principal of the Provincial Normal School, Winnipeg; Mr. Eric Hamber, B.A., St. John's Boys' School, Winnipeg; Mr. J. Harold Putman, B.A., Headmaster of the Provincial Model School, Ottawa; Mr. L. J. Clark, B.A., Head of the Department of Geography in the Harbord St. Collegiate Institute, Toronto; Mr. A. J. Pineo, B.A., Science Master in the High School, Victoria; and Mr. James Hannay, LL.D., of Fredericton.

TORONTO, July, 1906.

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PART I

GENERAL GEOGRAPHY

I. THE EARTH'S MOVEMENTS

Form and Size. — The earth is a sphere having a circumference of about twenty-five thousand miles and a diameter of nearly eight thousand miles. It is slightly flattened at the poles, however, so that the line extending through the centre, from pole to pole — called the earth's *axis* — is a little shorter than that extending in the opposite direction at the equator.

The earth is known to be round, not only because people have travelled around it, but also because its shadow, as seen in an eclipse, is always round. Show how it is true that a sphere is the only body that will always cast a round shadow. Give another proof of the spherical form of the earth.

Daily Motion. — The earth is rapidly rotating, that is, turning on one of its diameters, called the *axis*. When we glance out of the window of a moving car, the objects we pass appear to be moving in the direction opposite to that in which we are travelling. It seems as though we were standing still. In a similar way the rotation of the earth makes the sun *appear* to rise and set, and for a long time people believed that it was the sun that moved, and not the earth.

In what direction must the earth rotate, since the sun appears to move from east to west? The period of time required for one rotation is called a *day*. Since the circumference of the earth at the equator is about twenty-five thousand miles, how far does a point on the equator move in an hour? In a minute?

By rotating a globe or an apple in the sunlight show how day and night are caused on the earth. Hold the sphere still; what would be true on opposite sides of the earth if it did not rotate at all? What might be the effect upon life on the earth if the same side were always toward the sun?

Yearly Motion. — There are other variations of our light and heat besides those due to the earth's rotation. For instance, if we could spend a summer with the Eskimos in Greenland, we should find weeks of constant day,[1] and be able to see at midnight as well as at midday (Fig. 166). Late in the summer, the sun begins to set, and finally it fails to appear even at noon. Then it becomes bitterly cold (Fig. 1).

FIG. 1.

Some of the Eskimos whose homes are in the frigid north. The mothers carry the babies in fur hoods on their backs.

On the other hand, in Central America the sun reappears every morning in the year; and every noon it is almost directly overhead, while for a part of the year it is exactly overhead. No snow and ice are seen, and the climate is so warm, even during the winter, that the inhabitants wear as few clothes as possible. Indeed, some savages in such hot countries wear almost none (Fig. 2).

FIG. 2.

Savages whose homes are in the tropical zone. Contrast their dress with that of the Eskimos (Fig. 1).

Even where each of us lives, the period of daylight and the temperature are changing from week to week. Describe these changes as you yourself have observed them.

The causes of these changes are indicated in Figure 3. There the earth is represented on September 23 as receiving sunlight from pole to pole. On December 21 the north pole is shrouded in darkness, while the south pole (which is shut off from our view in the figure) is within the light. On March 21 the sunlight again extends from pole to pole; and on June 21 the north pole lies fully in the light, while

[1] Exactly at the north pole there are six months of day and six months of night.

the south pole is in darkness. In other words, the earth has a yearly motion around the sun,—called its *revolution*,—and it is the various positions that it takes with reference to the sun, while on this journey, that cause our changing length of day and our seasons.

Although the sun is ninety-three million miles from us, the earth is moving at such a tremendous rate that it completes one

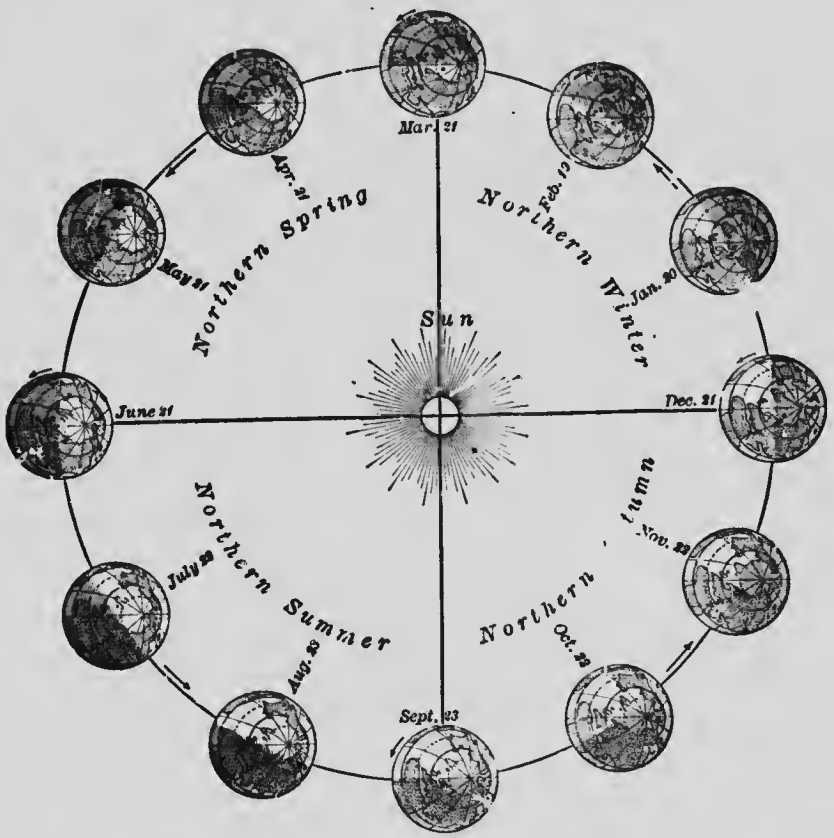


FIG. 3.

To illustrate the revolution of the earth around the sun. The shaded portion represents night. The end of the axis around which the earth rotates is the point where the lines come together (the north pole). At what date is this pole turned toward the sun? Away from it? Neither toward nor away from it? What portions of the earth do the sun's rays reach at each of these times?

journey around the sun, or one *revolution*, in almost exactly 365 days. This explains how we get our year. The almost circular path that the earth follows in this revolution is called its *orbit*, and the imaginary plane in which the earth's yearly path lies is called the *plane* of its *orbit*. To understand this it is well to think of the *plane* as a perfectly flat surface of great extent, and of the *orbit* as a

curve marked upon it (Fig. 4). If a boat sails around an island, the water surface represents the plane in which it travels.

The Attraction of Gravitation. — In its revolution the earth is moving at the rate of more than one and a half million miles per day. And at the same time it is whirling or rotating rapidly on its axis, as already explained.

As in the case of the earth's rotation, one might ask, Why are we not swept from the earth by the wind? The answer, as before, is that the air, and everything else upon the earth, is drawn toward it and held in place by the force of gravity, so that all travel together in the journey around the sun.

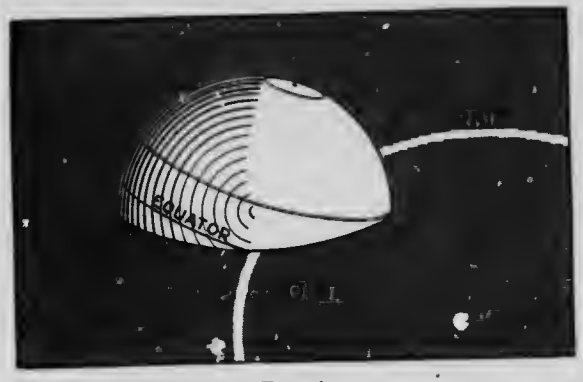


FIG. 4.
To illustrate the earth in its orbit.

If the earth is revolving at such a fearful speed, why does not the earth itself fly away into space? As a stone swinging round at the end of a string flies off when the string breaks, so it might seem that the earth would fly away, since there *appears* to be nothing holding it to the sun.

But there *is* something to hold it. It is not a string nor a rope, to be sure, but something far stronger. The sun is very much larger than the earth, in fact over a million times as large, and attracts the earth to it, as the force of gravity attracts men and houses to the earth. This *attraction of gravitation*, which the sun exerts upon the earth, is what prevents the latter from flying far off into space; it holds the earth as firmly as the string holds the stone.

Length of Day and Night; the Seasons. — On September 23 the sun's rays are vertical at the equator (Fig. 3), *i.e.* directly over the heads of the people living along that line. Then the days and nights are equal over all the earth. This time is called the *autumnal equinox* (the latter from two words meaning *equal* and *night*).

On December 21 the sun's rays are vertical at the *Tropic of Capricorn*, and all the region included in the Antarctic Circle is within the light. That is the date for the beginning of winter in our hemisphere and for our shortest day. After that, on March 21, the sun's rays are again vertical at the equator. This time, called the *vernal equinox*, is the beginning of our spring. Then our days gradually lengthen until June 21, when the sun's rays are vertical over

the Tropic of Cancer, and light up all the region within the Arctic Circle. That is the beginning of our summer. This will be made clearer by examining the following diagrams: —

If, as in Figure 5, the earth's axis were perpendicular to the plane of its orbit, it is evident that every place on its surface would have twelve hours day and twelve hours night. The regions about the equator would have, as now, the hottest climate, while toward the poles it would grow gradually colder. There would be no difference in temperature at any given place throughout the year, and consequently none of the changes which we call seasons.

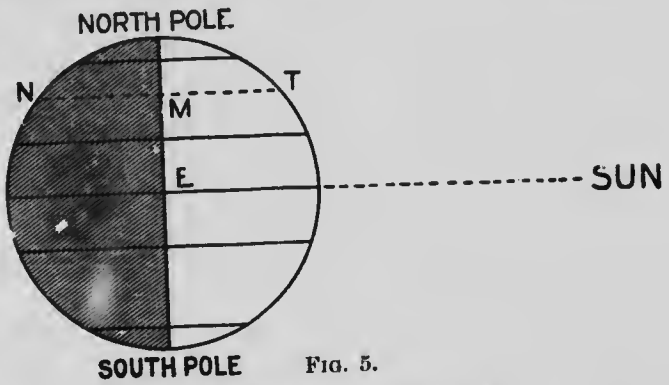


FIG. 5.

Diagram to illustrate seasons.

Figure 6 represents the earth on June 21, with its axis tipped, and the north pole inclined toward the sun. It will be seen that, although the earth rotates on its axis, a considerable area around the north pole (from *A* to *B*) remains continuously in the light, while an equal area around the south pole (from *D* to *C*) receives no light from the sun. When the earth occupies this position with reference to the sun, it is midsummer in the northern hemisphere, while in the southern hemisphere it is midwinter.

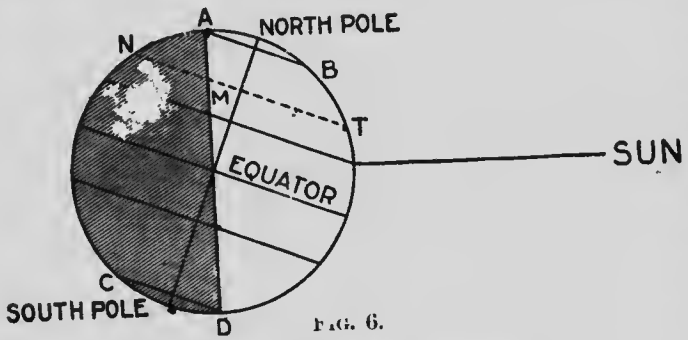


FIG. 6.

The position of the earth on June 21.

If in Figure 5 *T* marks the position of Toronto, then it is clear that one rotation gives an equal length of day and night, *TM* being equal to *MN*; but in Figure 6 the point *T* will be in sunlight for a much greater part of the rotation, *TM* being now much greater than *MN*, and the days will therefore be much longer than the nights.

In Figure 7, which represents the position of the earth on December 21, the conditions are reversed. The point *T* is now out of sunlight for a much greater part of its rotation than in sunlight, *MN* being greater than *TM*, and the nights will consequently be much longer than the days.

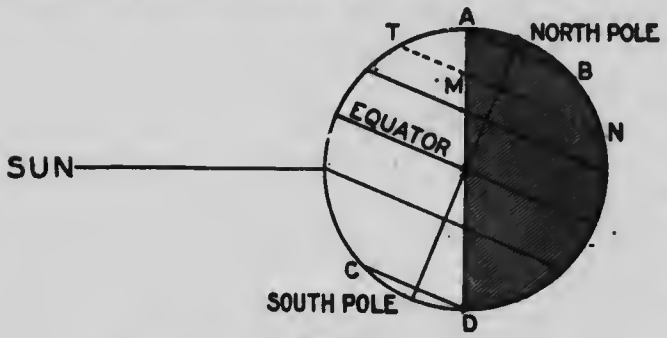


FIG. 7.

The position of the earth on December 21.

The Zones.—The sun gives heat as well as light, and the direction of its rays determines the boundaries of the zones. In Figure 8 the Torrid Zone marks that portion of the earth's surface over which the sun's rays are vertical at some time in every year. On that account it is very hot there. The north frigid and south frigid zones mark the areas about the poles that lie entirely in the light at one period and in the dark at another. But the sun's rays are always very slanting there, so that the temperature is always cold. The reason for this can readily be seen by examining Figure 9. If *AB*, *BC*, *CD*, and *DE* represent equal portions of the earth's surface, it is evident that *BC*, where the sun's rays fall more perpendicularly, receives a much greater number of rays than *AB*, where the rays strike the surface in a more slanting direction. *BC* will therefore receive much more heat from the sun than *AB*.

FIG. 8.

A map of the zones. Make a drawing similar to this.

Show the boundaries of the temperate zones, and explain why these zones are called temperate. Compare the climate of the part of the temperate zone in which you live with that of some other part of the same zone with which you are familiar or about which you have read.

The Moon

The moon is a satellite of the earth, about 238,000 miles distant from it, and accompanies it on its annual journey round the sun. It is a sphere of about 2150 miles in diameter.

The Revolution of the Moon. — Once every month, about sundown, the moon is seen as a thin-curved streak of light near the western horizon. The fact that moon and sun now set almost together shows them to be on the same side of the earth. About seven days later the moon will be seen as a half circle high in the heavens, at sundown, thus showing sun and moon to be at right angles to each other. A week later the moon will appear as a complete circle on the eastern horizon as the sun disappears below the western, thus showing sun and moon to be now on opposite sides of the earth. After the lapse of seven days more the moon will rise as a half circle at midnight, sun and moon being again at right angles; while a little more than seven days later the sun and moon are again together. Thus the moon has made one complete revolution about the earth. The time required for the completion of this movement from the sun back to the sun again is $29\frac{1}{2}$ days, and is called a *lunar month*.

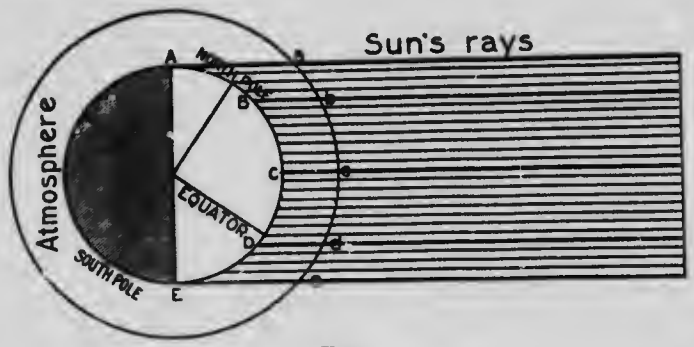


FIG.

Diagram to illustrate the relative heating power of vertical and oblique rays.

The Moon's Phases. — The moon, as we have seen, shows a constantly changing appearance from a complete circle to a narrow crescent. These different appearances are called *phases*, and are owing to the fact that it is constantly changing its position with reference to both sun and earth.

In Figure 9 *A*, the moon at *a* is between earth and sun. Its dark side is then turned to the earth, and we receive no light from it. This is the *new moon*. About seven days later, when the moon has completed a quarter of its revolution, and has reached position *c*, half of its illuminated face is turned to the earth and it is seen as a half circle. It is then said to be in

first quarter, while at *g* it presents the same shape and is said to be in *third quarter*. In passing from *a* to *c* it appears as a crescent, as at *b*.

When the moon has reached position *e*, half its revolution is performed, and the whole of its illuminated side is turned to the earth and we see what is termed *full moon*. As it passes from *c* to *e* it grows from a half circle to full moon. During that time it is said to be *gibbous*. From *a* to *e* the moon has been growing in size, or *waxing*. From *e* to *a* it is gradually diminishing in size, and is said to be *waning*.

Review Questions. — (1) What is the earth's axis? (2) What was formerly believed about the earth's movement? (3) In what direction does the earth rotate? (4) Tell about variations of light and heat, (*a*) among the Eskimos, (*b*) in Central America, (*c*) at your home. (5) What other motion besides rotation has the earth? (6) What determines the length of our year? (7) Why do we not notice the rapid movement of the earth? (8) What prevents the earth

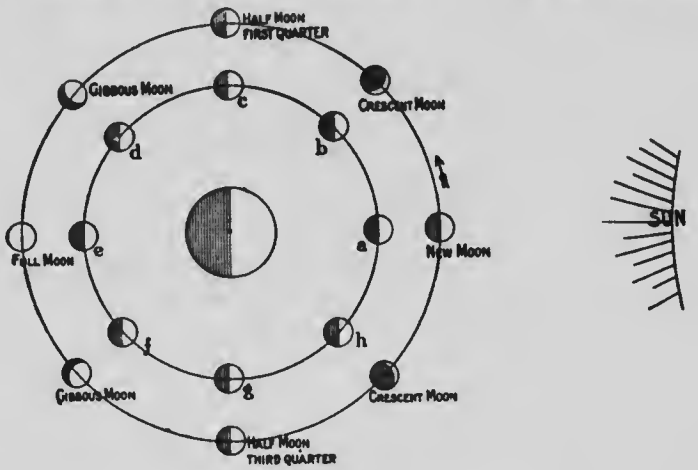


Fig. 9 *A*.

Diagram to illustrate phases of the moon.

from flying off into space? (9) Tell about the direction of the sun's rays. (10) On December 21. (11) March 21. (12) June 21. (13) Name the zones, and give reasons for their boundaries. (14) In which zone do you live? (15) What is the size of the moon? Compare its size with that of the earth. (16) What is meant by phases of the moon? (17) Explain the meaning of full moon, gibbous moon, waxing moon, waning moon.

Suggestions. — (1) Find the north star. (2) Write out the observations you have made about the moon. (3) Show by a globe, or a ball, how the two movements of the earth, rotation and revolution, can be going on at the same time. (4) How long is your day at present? Are the days growing longer or shorter? (5) During which months do they grow longer? (6) During which months shorter? (7) Find out why the earth is slightly flattened at the poles. (8) What might be some of the effects if each rotation of the earth lasted longer than twenty-four hours? (9) If much less? (10) At what time of day does your shadow always point directly north? (11) Notice how your shadow changes with the season in early morning. At noon. In the evening. (12) Tell about the direction and length of a man's shadow at noon on December 21 at various points

between the poles. (13) On June 21. (14) On September 23. (15) How long is our longest night? Our shortest? (16) Which zone experiences the slightest change of seasons? Why? (17) What advantages and disadvantages do you see in that fact for people living there? (18) Is it once or twice each year that the vertical rays of the sun fall upon any one place in the Torrid Zone? (19) Write a story telling about some changes that you have noticed, in plants and animals, which have been caused by the change in season. (20) Write a similar story about similar changes about which you have read. (21) In which zone would you prefer to live? Give reasons for your choice.

II. LATITUDE, LONGITUDE, AND STANDARD TIME

Latitude and Longitude

Need of a Means for locating Places. — In your study of geography you have doubtless noticed that it has frequently been necessary to refer to lines upon the earth, such as the Tropic of Cancer, the Equator, the Arctic Circle, etc., in order to locate certain places and the boundaries of the zones. But these lines are far apart, and there are many places between them to which reference must often be made. For instance, suppose we wished to state on what part of the earth London is situated; how could it be done? Of course, by taking a long time, it would be possible to describe just where this city is; but cannot some more convenient way be devised?

The difficulty is much the same as that which arises in a large city, where there are thousands of houses. No one person knows who lives in most of them, and if a stranger were looking for a friend, he might have much trouble in finding him.

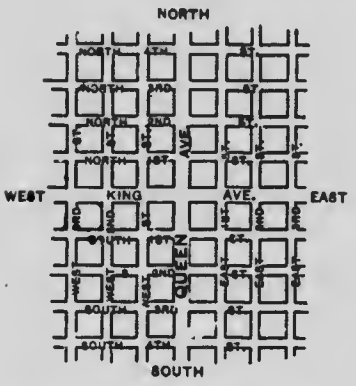


FIG. 10.

Map of a part of a city, to illustrate the need of naming streets.

The Streets of a City. — In this case the problem may be solved in a simple manner. A street running east and west may be selected to divide the city into two parts (Fig. 10). Any place north of this street is spoken of as being on the north side, and south of it as being on the south side. The streets to the north and south are numbered from this, as North 1st, North 2d, North 3d; and South 1st, South 2d, South 3d, and so on. Then if a man says that he lives on North 4th Street, one knows immediately that he lives on the north side, and that his house is on the fourth street from this central one.

But a city also extends a long distance east and west, and we need to know on what part of 4th Street this house is to be found. To answer that question, another street running north and south,

and crossing the east and west ones, may be selected to divide the city into east and west parts. The streets on the two sides are numbered from this one, as East 1st, East 2d, West 1st, West 2d, etc. (Fig. 10).

Then if a man lives on the corner of North 4th and East 3d streets, one knows not only that his home is *north* of a certain line, but *east* of another line. If the blocks, or the space between any two streets, are always the same, it will also be easy to tell the distance from each of the central streets to the house.

This plan is not necessary in small towns and villages, because the people there know one another, and are able to direct strangers easily. Few, if any, cities follow *exactly* the scheme here given; but many have a system of naming or numbering streets somewhat similar to this.

If you live in a large city, perhaps you can tell just how your streets are named or numbered.

Distance North and South of the Equator (*Latitude*). — Places upon a globe are located in much the same manner. For example, the equator, which extends around the earth midway between the poles, corresponds to the dividing street running east and west. The distance between the equator and the poles, on either side, is divided into ninety parts (Fig. 11), corresponding, we might say, to the blocks in a city. These, however, are each about sixty-nine miles wide and are called *degrees*, marked with the sign °.

In making maps people think of a line, or a circle, extending around the earth sixty-nine miles north of the equator, and called a *circle of latitude*. Any point upon it is one degree (1°) north of the equator, or 1° *North Latitude* (abbreviated to N. Lat.). Similar lines are imagined 2°, 3°, and so on up to 90°, or to the north pole.

Since all points on any one of these circles are the same distance from the equator, and from the other circles of latitude, the lines are *parallel;* and on that account they are called *parallels of latitude*. See a globe.

The same plan is followed on the south side, places in that hemisphere being in *South Latitude* (S. Lat.).

If one finds that a certain place is on the 8th, or the 50th, or some other parallel north of the equator, he knows how far it is north of the equator. Pelee Island, the most southerly point in Canada, is on the 42d parallel, London, Ontario, on the 43d, Fredericton on the 46th, and Winnipeg on the 50th. Knowing this, it is easy to see that London is 1°, or about 69 miles, farther

north than Pelee Island; Frederieton is 3°, or about 207 miles, farther north than London; while Winnipeg is 4°, or about 275 miles, farther north than Frederieton.

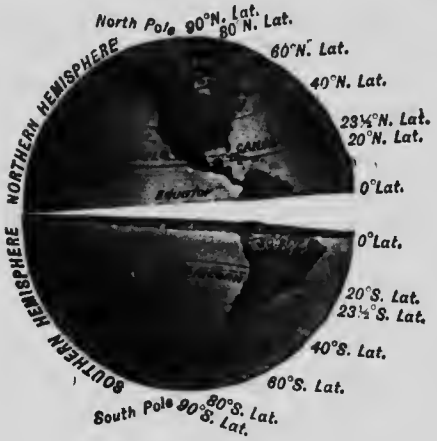


FIG. 11.

The globe, showing the two hemispheres and some of the circles of latitude.

From this it is evident that we can easily find the latitude of a given place by the help of these parallels, for *latitude is the distance north or south of the equator.*

Of course there are no marks *upon the earth* to show where these lines run, but they are of great use *on maps*, because they help us to locate places. Small maps and globes cannot well show the entire ninety parallels on each side of the equator, so that usually only every fifth or tenth one is drawn. Examine the maps of Canada and of England, to see which ones are given. Near what parallel do you live?

East and West Distances on the Earth (*Longitude*[1]). — But how about distance east and west? It is about twenty-five thousand miles around the earth at the equator, and some means must be found for telling on the map how far places are from each other in these directions.

Imaginary lines are used for this purpose, as before; but this time they extend north and south from pole to pole (Fig. 12), and are called *meridians*, or lines of *longitude*. In the case of the city it makes little difference what north and south street is chosen from which to number the others. It is only necessary that a certain one be *agreed upon*.

It is the same with these meridians. No one is especially important, as the equator is, and consequently different nations have selected different lines to begin from. In Great Britain the meridian extending through Greenwich near London is chosen, in France that through Paris, and in the United States the one passing through Washington is sometimes used. But it is important that all people agree on some one, so that all maps may be made alike. On that account most countries begin their numbering with the meridian which passes through Greenwich.

[1] The ancients thought that the world extended farther in an east and west than in a north and south direction. Therefore they called the east and west, or *long* direction, longitude; the north and south direction, latitude.

In Greenwich is a building, called an observatory, in which there is a telescope for the study of the sun, moon, and stars. As these heavenly bodies are of great help in finding the latitude and longitude of places, Greenwich seemed a fitting place from which to begin numbering the meridians.

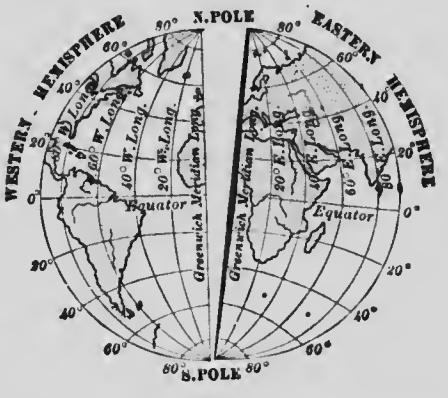


FIG. 12.

The earth, cut in halves along the Greenwich meridian, showing some of the meridians. The meridian 20° is usually considered the dividing line between the eastern and western hemispheres.

Commencing with this meridian as 0° longitude, people measure off degrees both east and west of it, and think of lines as extending north and south toward the poles, as they do of circles of latitude running parallel to the equator. Thus there is a meridian 1° west, another 2°, a third 3°, etc. Going eastward, they number 1°, 2°, 3° in the same way.

Any place on the 3d meridian west of Greenwich is said to be in 3° *West Longitude* (W. Long.); if on the 60th meridian, 60° W. Long. Any place on the 20th meridian *east* of Greenwich is in 20° *East Longitude* (E. Long.). St. John, N.B., is 60° W. Long., while Victoria is about 123° W. Long.

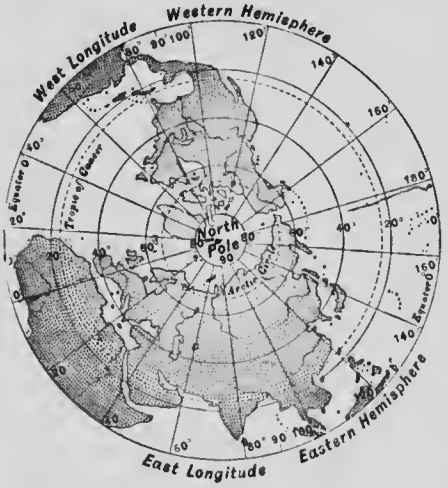


FIG. 13.

A view looking down on the north pole, to show how the meridians come to a point at the north pole. Notice that if the 0° meridian were continued it would unite with the meridian 180°.

The 180th meridian is a continuation, on the other side of the earth, of the Greenwich or zero meridian (Fig. 13), and the two together make a complete circle. Hence we may speak of *circles of longitude* as well as circles of latitude. Why must the meridian marked 180° E. Long. be the same as the one marked 180° W. Long.? Which meridian passes near Toronto? Winnipeg? Halifax?

If a large map is made of a small part of the earth, the circles of latitude and longitude are too far apart to be of much use. Therefore, it is customary to divide each degree into sixty parts called *minutes*, just as each hour is divided into sixty parts. Each minute of latitude and longitude is divided into sixty parts called

seconds, as each minute of time is divided into sixty seconds. The sign for a degree is °; for a minute ′; for a second ″. Thus 60 degrees, 40 minutes, and 20 seconds north latitude is marked 60° 40′ 20″ N. Lat. Examine some wall-map of a small section to find these signs.

Knowing the latitude and longitude of any place, it can, by the aid of a map, be as easily located as a house in a great city. For instance, Winnipeg is about 50° N. Lat. and 97° W. Long. It is therefore to the north and west of Toronto, which is about 43° N. Lat. and 79° W. Long.

Find the latitude and longitude of some of the large cities on the map of Canada. Notice also that only every tenth meridian is marked. Compare this with the map of New Brunswick. Since this map represents a smaller section, more meridians can be drawn upon it.

The circles of latitude are parallel to the equator and to each other, as you can prove by measuring the distance between them on a globe. But the meridians cannot be parallel on a globe, since they start from the poles and spread farther and farther apart until the equator is reached. Examine some of the maps in this book to see that the meridians are not parallel, while the lines of latitude are.

You can see how this is by taking the peeling from an orange (Fig. 14). The edges of each of the quarters spread far apart in the middle, or equator, but come together at the ends, or poles, of the orange.

Fig. 14.

An orange with a part of the peeling removed to show how the lines converge toward the poles, as the meridians converge on the globe.

A degree of longitude is a little over sixty-nine miles at the equator; but it decreases more and more as the poles are approached, until at the poles it is nothing, because all the meridians meet there at one point. Examine Figure 13, or, better still, a globe, to see that this must be true.

How a degree of latitude happens to be slightly more than 69 miles is easily understood. The length of a circle extending around the earth through the poles is about 25,000 miles; and this distance is thought of as being divided into 360 equal parts or degrees, that being a number that is exactly divisible by 2, 3, 4, 5, 6, 8, 9, and still other numbers. Divide 25,000 by 360.

Keeping in mind the number 360, you can understand why the distance from the equator to either pole is 90°, for that is one-fourth of the entire distance. How many miles is 90°?

You can now find the width of the five zones (Fig. 8). The tropical zone is bounded on the north by the Tropic of Cancer and on the south by the Tropic of Capricorn, each of which is $23\frac{1}{2}°$ from the equator. The Arctic and Antarctic circles are likewise $23\frac{1}{2}°$ from the poles. Give the width of each of the zones in degrees of latitude. In miles. What is the greatest width of Canada in degrees of latitude? In miles? How far is the southern extremity of Ontario from the Tropic of Cancer? How far is Vancouver from that tropic?

Standard Time

If you were to travel from Ottawa to Vancouver, you would find on arriving that your watch was three hours too fast. The reason is that the rotation of the earth, from west to east, causes the sun's rays to fall upon the Atlantic coast more than three hours sooner than upon the Pacific, so that when it is noon in Ottawa, it is about nine o'clock in the morning at Vancouver.

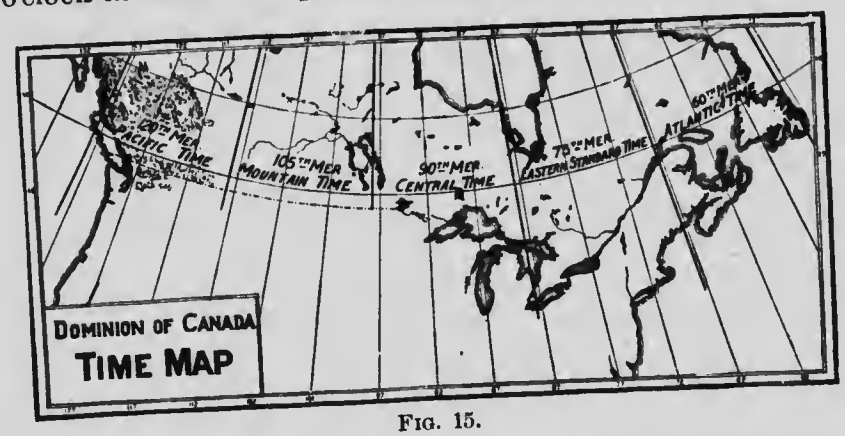


Fig. 15.

Measuring from east to west, every place has a different time by the sun, and some years ago each city had its own *sun* or *solar* time. But when railways were built, connecting many places, these differences became a source of constant annoyance to the traveller, for his watch showed the time of only one place.

In order to avoid this trouble, our continent has been divided into belts, in each of which the railways, and most of the towns, have the same time. Since this time is the *standard for all*, these belts are called the *Standard Time Belts*. The one in the extreme east, which includes the Maritime Provinces, is called the *Atlantic Time Belt*; that next west of it, which includes Quebec and part of Ontario, is called the *Eastern Time Belt*. What are the others? (Fig. 15.)

In travelling across the country from Ottawa to Vancouver, a person starts with his watch set at the standard time for the Eastern Time Belt. After a while he comes to a place where the time changes one full hour; then he has Central Time. Going still farther west to the Mountain Belt, the watch is again set back one full hour; what is done when the Pacific Belt is reached? In this way, only a few changes of the watch have to be made.

Our study of longitude helps us to understand what determines the places for changing this time. When the sun is rising at a certain point on a meridian, it is rising at every other point on that meridian.[1]

The earth makes one complete rotation every 24 hours, so that sunrise, noon, and sunset reach each of the 360 meridians in the course of the day of 24 hours. Dividing 360 by 24 gives 15; that is the number of meridians that the sunrise or sunset passes over in a single hour. Therefore, if in one place, as at Ottawa, close to the 75th meridian, it is sunrise at six o'clock, it will be sunrise one hour later at all points 15° west of this, or on the 90th meridian.

This explains what has determined the boundary lines of the time belts. The time selected for the Eastern Belt is that of the 75th meridian; for the Central Belt, that of the 90th meridian, which is just one hour later. What meridian is selected for the Mountain Belt? (Fig. 15.) For the Pacific Belt? Each of these meridians runs through the *middle* of the belt whose time it fixes, so that the eastern boundary of the Central Time Belt is halfway between the 75th and 90th meridians, that is W. Long. $82\frac{1}{2}$; and the western boundary is halfway between the 90th and 105th meridians, or $97\frac{1}{2}°$ W. Long.

In reality the railways do not change their time *exactly* according to these boundaries, for oftentimes the meridians extend through very unimportant points, or even cross the railways far out in open country. Instead of following the exact boundaries, they select well-known places, like Rossland in British Columbia, or Spokane and Salt Lake City in the United States, at which places the change is made from Mountain to Pacific time; or like Sault Ste. Marie, Sarnia, and Windsor in Ontario, or Buffalo and Pittsburg in the United States, where the change is made from Eastern to Central time. Therefore the boundaries which represent the places where the railways *actually* change their time are somewhat irregular, and not always on the proper meridian (Fig. 15).

[1] This does not apply to the frigid zone, where the sun does not rise at all during a part of the year, and where it does not set during another part of the year.

You see that the object of these Time Belts is to save annoyance, and that *for most places the standard time is incorrect time.*

QUESTIONS. — (1) How may an east and west street be used in a city to locate houses? (2) How may a north and south street be so used? (3) Make a plan of a city showing two central streets and others numbered from them. (4) What corresponds to the central east and west street in locating places upon the globe? (5) Into how many parts is the distance between the equator and each pole divided? (6) What is each of them called? (7) What is meant by saying that a place is in 1° N. Lat.? (8) How far apart are the circles of latitude? (9) Why are these circles called parallels? (10) What is S. Lat.? (11) What is a meridian? (12) Why is it necessary to have them upon maps? (13) Which meridian is most commonly chosen as zero? Why that one? (14) How high do the numbers of the meridians run? (Fig. 13.) (15) What is meant by saying that a place is in 3° E. Long.? In 90° W. Long.? (16) What is meant by circles of longitude? (17) What subdivisions of a degree are there? Why are they necessary? (18) Show that meridians are not parallel. (19) What is the length of a degree of longitude at the equator? (20) Show how a degree of latitude happens to be about 69 miles. (21) Explain why the time is continually changing as one goes west. As one goes east. (22) How has this caused annoyance in travelling? (23) What remedy has been found? (24) What are the names of the Standard Time Belts in Canada and the United States? (25) What is the difference in time between the belts? (26) Which meridians are used to fix the boundaries? Why these? (27) Show the boundaries on the map (Fig. 15). (28) Why is standard time really incorrect for most places?

SUGGESTIONS. — (1) What is the latitude and longitude of Hamilton? Of Ottawa? Of Regina? Of your nearest large city? (2) Find some cities that are on or near the 43d parallel of latitude. (3) What place is in 25° N. Lat. and 81° W. Long.? Near 46° N. Lat. and 74° W. Long.? (4) Make a drawing showing several of the meridians. (5) Find places that have nearly the same latitude as your home. (6) Where and how much would you change your watch in travelling from Victoria to Sydney? (7) What is the difference in time between Montreal and Calgary? (8) Examine some railway time-tables to see how they indicate the changes in time. (9) What is the difference where you live between Standard Time and Solar Time? (10) Show on a globe or map where a ship would be in the Atlantic when in zero latitude and longitude.

III. WINDS AND RAIN

Winds

Review. — Our previous study of geography has shown that very regular winds blow over a considerable part of North America. For example, the West Indies, Central America, and southern Mexico receive their winds generally from the *northeast*, while on

Fig. 16.

To illustrate how the air moves in a room heated by a stove.

the western side of the continent, all the way from San Francisco to Alaska, they blow quite regularly from a *westerly quarter*. On the other hand, in the eastern part of Canada, the winds are irregular in direction, although prevailing from the west. Let us examine into the causes of these movements of the atmosphere.

Effect of a Stove. — As a beginning of the inquiry, we will consider the currents of air produced by a hot stove in a room (Fig. 16). As the air near the stove is warmed, it expands and

grows lighter. Then the cooler air settles down and flows in, forcing upward that which has been warmed. The latter grows cooler in contact with the cool ceiling and walls of the room; and, being made denser and heavier on that account, it again settles toward the floor and then once more moves toward the stove. In such a room you can easily observe how much warmer the air is near the ceiling, where it has risen from the stove, than near the floor at some distance from the stove.

Winds of the Earth. — The greater winds of the earth may be compared to this movement of air in a room, the torrid zone, warmed by the sun's rays, taking the place of the stove. There, owing to the torrid heat, the atmosphere becomes expanded and light. The heavier air to the north and south flows in, pushing the light air away and producing winds, known as the *trade winds* (Fig. 17), which begin in the temperate zones, hundreds of miles away.

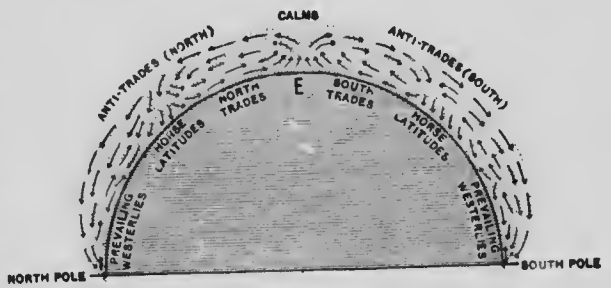


FIG. 17.

Diagram to show, by arrows, the movement of the greater winds of the earth.

Since the heated air must escape somewhere, it rises far above the surface, and then moves back in the same direction from which it came, forming the return trades or *anti-trade winds* (Fig. 17). The atmosphere extends many miles above the earth, so that there is plenty of room for two winds blowing in opposite directions, one above the other.

In Cuba, the Caribbean Sea, and elsewhere, where the trade winds at the surface are blowing toward the southwest, one notices that the clouds far up in the sky are steadily borne in the opposite direction by the anti-trades. Also, when volcanoes in Central America have been in eruption, the ashes that were blown out from them have been carried hundreds of miles in a direction opposite to that of the prevailing trade winds at the surface.

Being cooled on account of its great height, the air of the anti-trades slowly settles, some of it coming to the surface at about a third of the distance to the poles. There it spreads out, a part continuing on toward the poles, a part returning to the equator as the trade winds (Fig. 17).

As you see, the correspondence between these currents in the atmosphere and those in the room is quite close. In both cases air moves in toward a heated place, then up, then outward and down, and once more inward toward the heated part. Make a drawing to illustrate these *four* directions of movement of the air.

Effect of Rotation. — There are differences, however, and one of them is especially important. In the case of the room, the currents move *directly* toward the stove; then, after rising, directly away from it. If the earth stood perfectly still, the trade winds would doubtless blow directly toward the equator from the north and south and the others directly away from it.

The daily rotation of the earth, from west to east, greatly interferes with that movement. Because of rotation, the trade winds are turned, or *deflected*, from their straight course toward the equator. Those in the northern hemisphere are turned to their right, so that they come from the *northeast;* and those in the southern hemisphere are turned toward their left, and therefore come from the *southeast.*

The direction of the anti-trades is also changed toward the right in the northern hemisphere, where they blow from the southwest, and toward the left in the southern hemisphere, where they blow from the northwest. Thus the anti-trades blow over the same route as the trade winds, but in the opposite direction. We can only state the facts here, for the explanation is far too difficult to give.

Wind Belts. — Now we see why the West Indies, Central America, and southern Mexico receive such regular winds from the northeast, for they lie in the range of the trade winds just described. The prevailing west winds of the Pacific coast are a part of the air of the anti-trades that has settled to the surface and is moving on in a great whirl around the poles. This region is known as the belt of *prevailing westerlies*, because the air moves so steadily from a westerly quarter.

If you watch the higher clouds you will find, in most parts of Canada, that they are moving from the west toward the east; and the winds at the surface are also more often from the west than from any other quarter. This section, including Canada and northern United States, in which the prevailing winds are so nearly from the west, is known as the region of *prevailing westerlies.*

What has been said about the winds of North America applies, with some exceptions, to other parts of the world; in other words, there are several belts of regular winds extending around the earth. Figure 20 shows these very clearly. Point out the belt of *trade*

winds north of the equator. Point out the *prevailing westerlies.* Point out the two corresponding belts of wind on the south side of the equator. Notice how much more definitely these are all shown over the ocean than over the land.

Winds are much more steady on the ocean than on the land for several reasons, the principal one being that the temperature of the water does not change so quickly as that of the land. On land one place may become much warmer than another not far away, and then winds blow toward the warmer section. This often changes the direction of the regular winds.

So steady are the prevailing westerlies over the ocean, that, in the southern hemisphere, where there is little land, they almost always blow from the west. Indeed, it is said that vessels, choosing a course south of Africa and South America, can sail around the world with fair winds almost all the way, if they go *toward* the east; but if they sail in the opposite direction, the winds are against them.

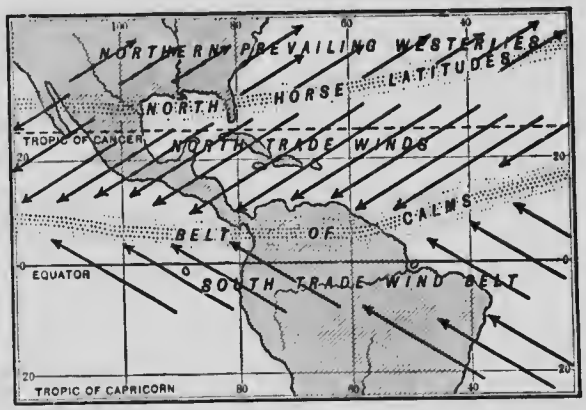


FIG. 18.

Diagram to show the position of the trade wind belts and the belt of calms in summer. Compare with Figure 19.

All these belts of wind owe their existence to the differing temperatures of the several zones; and since the sun, which is the cause of these zones, has shone for millions of years, and will probably continue to shine for millions more, we may be certain that these great winds are *permanent winds.* The currents of air in a room cease when the stove grows cold; but, for ages to come, the sun will heat the torrid zone more than the temperate. Thus the trade winds will be kept in motion day and night, winter and summer, as they now are, and as they were when they helped Columbus on his venturesome voyage across the Atlantic.

Belt of Calms and Belts of Horse Latitudes. — Besides the four belts of winds just mentioned there are three belts of calms and light, variable winds. As the trade winds approach the central line of the heated belt, or the *heat equator*, they travel more slowly. Then, owing to expansion from heat, and to pressure from the colder air behind, the air rises over a broad area to a

great height. In this belt of rising air, whatever winds are felt are light and changeable, and calms often prevail; hence the name *belt of calms*, as shown in Figures 17 and 20. The width of this belt is several hundred miles.

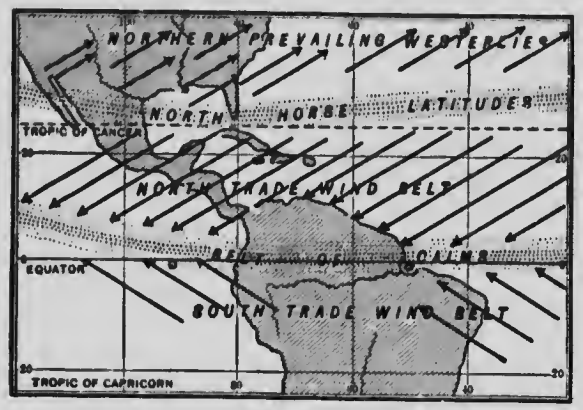


Fig. 19.

Diagram to show the position of the belt of calms and the trade winds in winter. Compare with Figure 18.

Northern Mexico and southern California are situated in another belt of light winds with frequent calms. Here, however, as stated before (p. 19), the air of the anti-trades is *settling* toward the earth, a part to return as trade winds to the belt of calms, and a part to continue onward as the prevailing westerlies. This is known as the region of the *horse latitudes*.[1] Point out the belt on Figures 17 and 20. Show the corresponding belt on the south side of the equator.

Effect of Revolution. — The belt of most intense heat is not always in exactly the same part of the earth, being north of the equator in June, when the sun is vertical at the Tropic of Cancer, and south of it in December, when the sun's rays are vertical at the Tropic of Capricorn. This causes all these belts to change their position somewhat, being farther north in our summer than in our winter (Figs. 18 and 19). The effects of this fact are very important, as we shall see.

Rain

Causes for Rain. — Knowing the wind belts that encircle the earth, we have a key to the principal rain belts; for winds are the water carriers of the earth. Water which is evaporated from the surface of the oceans and lands is borne along in the air. As rain or snow it descends to the earth, abundantly along most coasts, and, usually, less liberally toward the interior of the continents.

[1] Called horse latitudes because sailing vessels, carrying horses from New England to the West Indies in the early days, were so delayed by the calms that the horses had to be thrown overboard when the drinking water gave out.

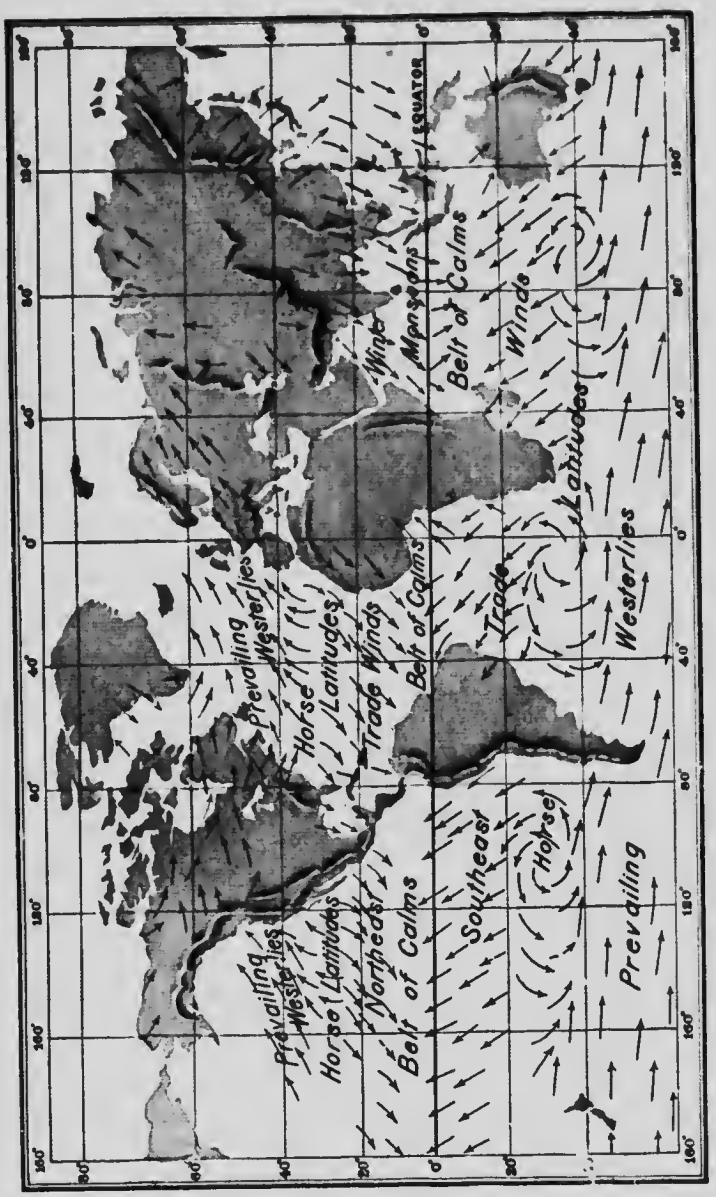


FIG. 20.

A diagram to show the principal wind belts of the earth.

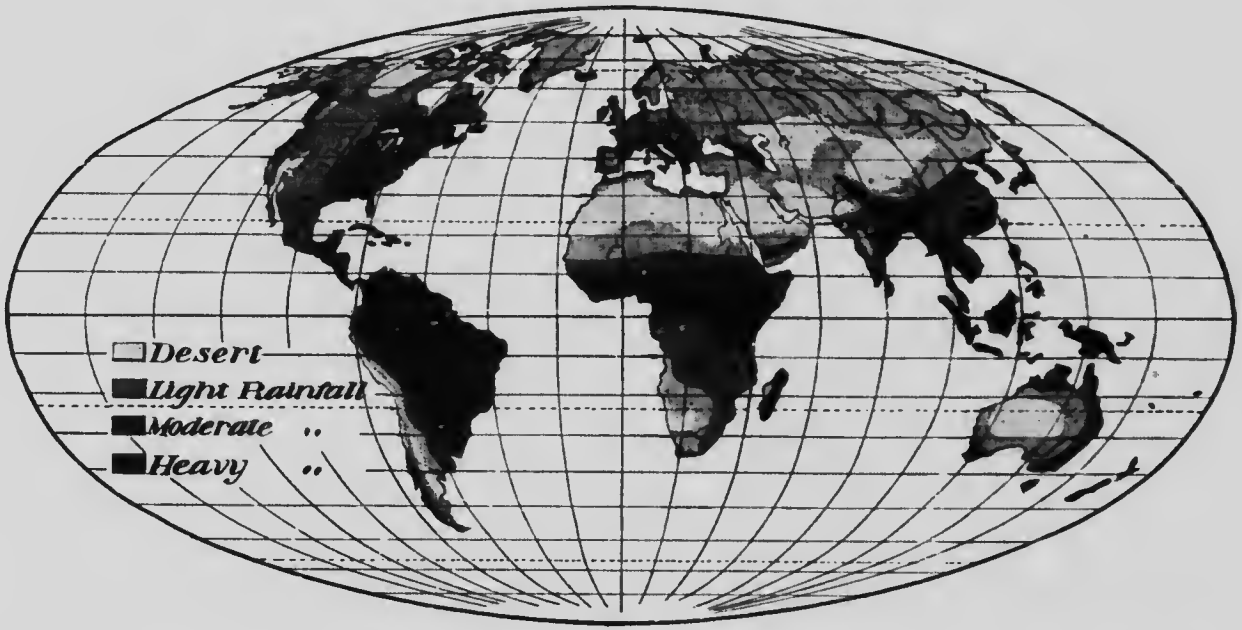


FIG. 21.

A rainfall map of the world. In which of the wind belts (see Fig. 20) do we find the heaviest rainfall? On which coasts? Where are the deserts? Explain the location of those on each continent. Why should there be more desert in Africa than in South America?

It is an important fact that there can be more water vapor in warm than in cool air. Therefore, whenever air is cooled sufficiently, some of the water vapor which it bears is condensed. For example, vapor condenses on an ice-water pitcher because the air next it is cooled; and dew forms on grass when the air near the ground grows cool in the evening. In a like manner the vapor in our breath forms a little cloud when the breath in winter is cooled by mixture with the cold outside air.

Rain is usually caused by the cooling of air which is rising to higher levels and therefore expanding. When you open the valve of a bicycle tire, the outrushing air expands and grows cool; and if you place your finger over the valve, you can feel the coolness. In a similar way, when air rises above the surface of the earth it expands because there is less air above to press upon it. Then it grows cool; and while doing so, some of its vapor may be condensed to form clouds and raindrops. So whenever air from the damp oceans is rising over highlands, or whenever it is being raised over warm lands by the cooler air that pushes underneath, as in the belt of calms, rainfall naturally results. Briefly, — *when air rises, it expands and cools; and then rain commonly follows.*

On the other hand, air that is settling grows warmer, and instead of giving up its vapor, it becomes dry and clear. This may again be illustrated by reference to the bicycle; for when air is pumped into the tire, the pump becomes warm as the air is compressed. In a like manner, air that is descending toward the earth's surface is compressed and warmed because of the increasing pressure of the atmosphere above. Since there can be more vapor in warm than in cool air, when air flows down the mountain slopes, or descends from high altitudes, as in the horse latitudes, clouds disappear and water is evaporated from the ground. Briefly, — *when air descends, it becomes denser and grows warmer; then the sky is clear and the weather dry.*

Rain Belts in North America. — These facts have been well illustrated in the rains of North America. The northeast trade winds, having gathered a large amount of vapor from the Atlantic Ocean, the Caribbean Sea, and Gulf of Mexico, deposit it on the windward slopes of the West Indies, southern Mexico, and Central America (Fig. 22). The southwestern slopes of these islands, however, receive a smaller quantity, and the western coast of Mexico is therefore arid. The prevailing westerlies, having travelled a long distance over the Pacific, likewise cause heavy rains along the western coast of North America (Fig. 23). But the land farther

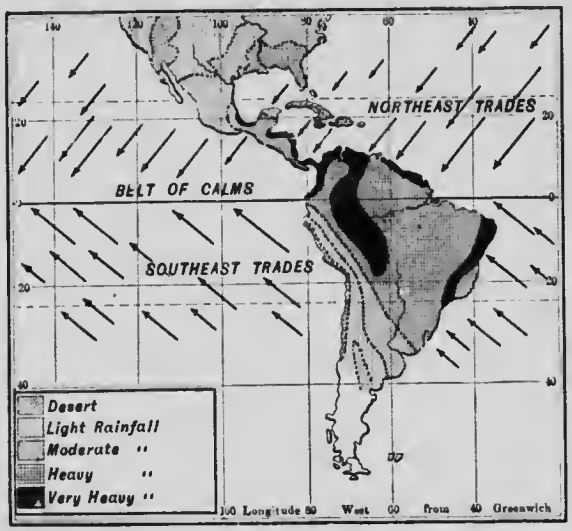


FIG. 22.

The rainy east coasts and arid west coasts of the trade wind belts. Also the rainy belt of calms of South America.

east grows more arid, because these winds also lose their moisture in passing over the land. Northern Mexico and southwestern United States, lying within the horse latitudes, where the air is descending, receive very little rain and are arid (Fig. 23).

Other Rainy and Arid Regions of Northern Hemisphere. — Other regions lying within these belts illustrate the same principles. For example, note (Fig. 22) what heavy rains are brought to northern South America by the northeast trade winds. The Hawaiian Islands, also lying within their range, are kept moist by them, especially on the windward side of the highlands, just as in the West Indies.

But the northeast trade winds of the Old World deposit little moisture, as is clearly shown by Figures 21 and 24. One reason is that they blow largely over land, rather than over water; it is mostly level land, too. Another very important reason is that the air is mov-

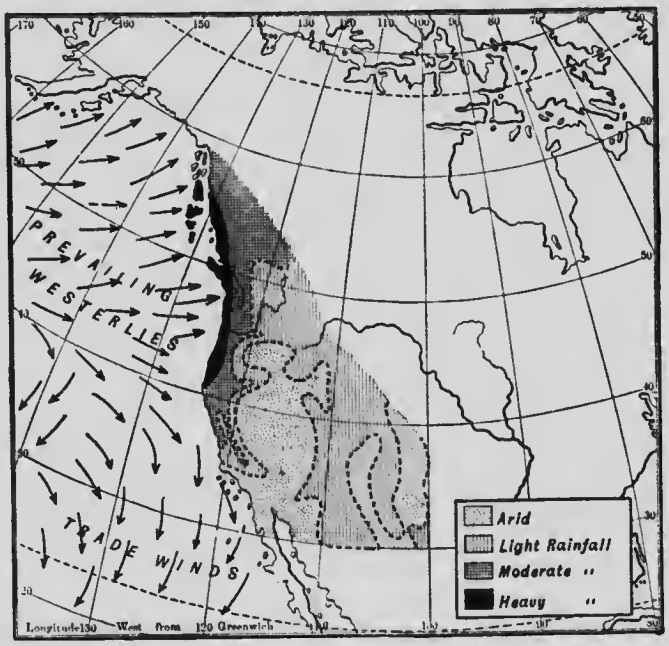


FIG. 23.

The heavy rainfall where the prevailing westerlies blow over the rising coast. What is the condition farther east? What is the case where the trade winds blow? Why?

ing from a cooler to a warmer region and is therefore not forced to give up its moisture. On the contrary, it can take more vapor and is steadily evaporating water. Thus the trade winds are drying winds on the land, and this accounts for the desert of Sahara and other deserts. Europe is affected by the *prevailing westerlies* much as western North America is. But its three southern peninsulas lie partly within the horse latitudes, and their southern portions are much affected by drought.

South of the Equator. — South of the equator we find the southeast trade winds causing heavy rains on the east coast of South America (Fig. 22); then proceeding across the continent, they cause other heavy rains in the neighborhood of the Andes; but parts of Peru and Chile on the western side of the mountains are left to suffer from drought although within sight of the greatest ocean in the world. Australia, lying in the same belt of winds, is similar. But this time the loftiest highlands are close to the east coast, so that nearly all the remainder of the country suffers for want of rain (Fig. 25).

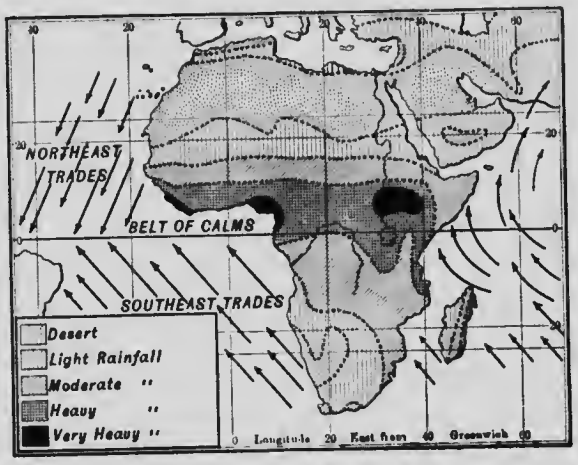


FIG. 24.

To illustrate the desert regions in the trade wind and horse latitude belts of Africa. Also to show the heavy rainfall in the belt of calms. Find the similar belts on Figures 22, 23, and 25.

Belt of Calms. — The belt of calms is the most rainy of all the belts (Figs. 22, 24, and 25), because its hot, moisture-laden air is rising and cooling. After a clear night in that region, the sun usually rises in a cloudless sky. As the morning advances and the heat grows more intense, the damp air rises more rapidly; then small clouds appear and grow steadily until rain falls from them. Showers occur practically every day, increasing in the afternoon. When the sun sets and the air rises less actively, the clouds melt away, the stars appear, and the night is as clear as before. The hot, moist summer days of parts of Canada, with their daily thunder showers in the afternoon and evening, illustrate the weather that is repeated day after day in this belt of calms.

It is the heavy rain there that supplies the dampness necessary for the dense jungles of the tropical forest of the Amazon Valley, Central Africa, and the East Indies (Fig. 21).

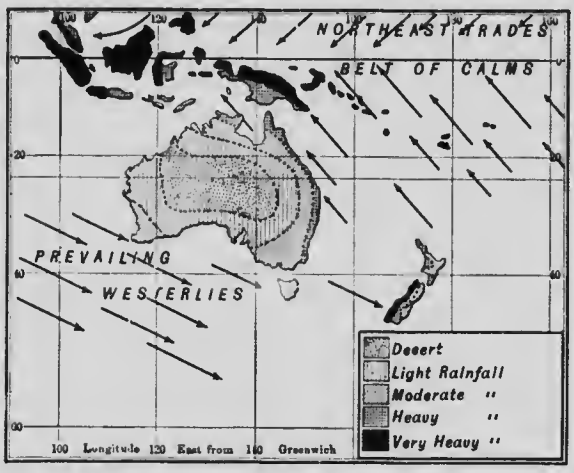


FIG. 25.

Showing the heavy rainfall on the east-facing coast of Australia where the trade winds blow. Notice also the arid interior and west coast. What is the condition in the belt of calms? What resemblance do you see to Figure 23?

Migration of Rain Belts. — The statement has been already made (p. 22) that the wind belts shift northward in summer and southward in winter. One of the most important effects of this change is upon the rainfall. In the torrid zone, for example, many places are within the belt of calms during the summer of their hemisphere, and are swept by the drying trades in their cooler months, thus dividing the year into wet and dry seasons. The part of northern Africa lying between the Sahara and the Sudan affords an instance of this (Figs. 26 and 27).

FIG. 26.

Winds and rainfall in South America and Africa from December to February.

Eastern Canada and Northeastern United States. — Thus far only the regular wind and rain belts have been considered, and no explanation has been made of the condition of variable winds in eastern

Canada. We might expect that the west winds, so dry after passing over the western highlands, would continue onward with the result that our eastern provinces would have very little rainfall. But

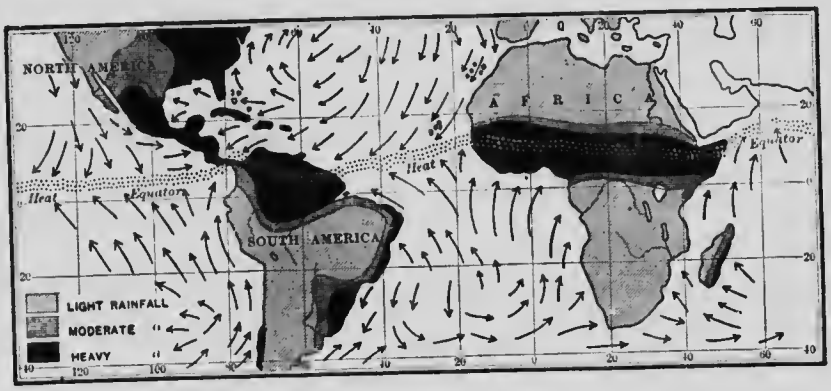


FIG. 27.

Winds and rainfall in South America and Africa from June to August. Compare with Figure 26 to see how the belts of heavy rain have migrated as the wind belts have shifted with the change of season.

we know that abundant rains fall in this section (Fig. 28). We know, also, that there are no very regular winds over this vast area; on the contrary, both winds and temperature are quite changeable.

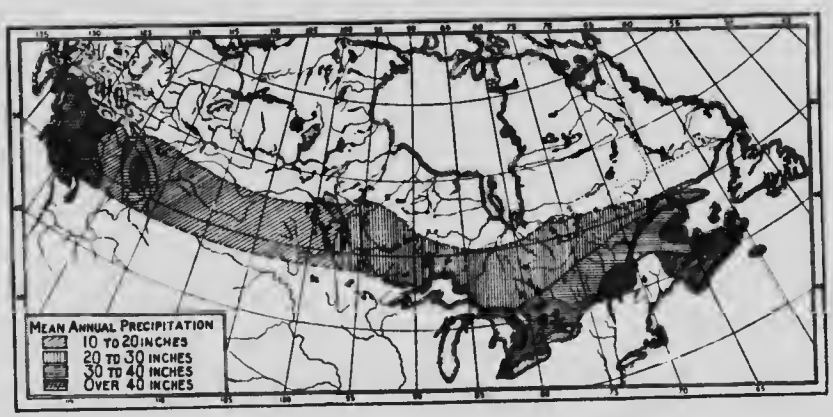


FIG. 28.

A map to show the rainfall of Canada in inches; that is, the number of inches of water that would collect all over the surface in a year if all the rain remained where it fell.

In any particular locality on one day it may be warm and pleasant, with a south wind; the next day a cool, dry wind blows from the northwest; after two or three days this gives place to a cloudy sky

and rain, brought on by south or east winds; and then fair, cool weather sets in, with northwest winds again.

Let us inquire into the cause of these changes. From time to time out in the northwest there comes to be a place, or an *area*, of *low pressure;* that is, an area where the air is lighter than that over the surrounding region. The air from the surrounding country, where the pressure is greater, hurries toward the low-pressure area, even from hundreds of miles away, causing winds which on the south side blow from the south, on the east side from the east, etc. Toward the place where the pressure is low, the air is flowing in from all sides, then rising. As it rises, the vapor

FIG. 29.

A section through a cyclonic storm to show the immense area of clouds and rain. *A* represents the Appalachian Mountains; *M*, the Mississippi River. The direction of the winds is shown by the arrows.

condenses, forming clouds and rain, as in the belt of calms. Such an area of low pressure, with its clouds and rain, is known as a *cyclonic storm area* (Fig. 29); and it is during these storms that most of the rain of eastern Canada and northeastern United States comes.

Instead of remaining in one place, the cyclonic storms steadily travel onward, usually beginning in the northwest and *always* passing eastward. The paths followed by the storm centres generally pass over the Great Lakes, down the St. Lawrence Valley to the ocean. They move eastward because the prevailing westerlies carry them along; indeed, these great, whirling, cyclonic storms are apparently eddies in the prevailing westerlies, similar to the eddies in the current of a stream. The whirl in the northern hemisphere is always in the direction opposite to the hands of a watch, while in the southern it is with the hands. A knowledge of this law of storms is very useful to navigators, as it enables them to locate storm centres. When encountering a cyclonic storm in the northern hemisphere, the captain should turn his back upon the wind, and veer off to the right in order to get out of its track; while in the southern hemisphere he should veer to the left. The area of country upon which rain may be falling from the clouds of one of these storms is sometimes very great, places fully a thousand miles apart sometimes receiving rain at the same time (Fig. 29). As the storm moves eastward, it grows clear on the western side, while the cloudy and rainy parts appear farther and farther eastward.

The vapor is brought toward the storm centre from the Gulf and the Atlantic Ocean, being carried by the winds for hundreds of miles. The fact that there is no high mountain range extending across southern United

States is of great importance. If there were such mountains, instead of the low Appalachians and the open plains of the Mississippi Valley, the winds could not carry their vapor so far, but would drop it on the coast side, leaving the interior a desert.

Not only are rains caused by these storms, but hot spells and other changes as well. Warm winds, blowing toward the low-pressure areas from the south, are the cause of the winter thaws and the summer hot spells in eastern Canada. It is during these hot spells that thunder storms come; also, in some places, come *tornadoes*, often called "cyclones," in which the winds blow so fiercely that houses are torn to pieces. These are of frequent occurrence in the Mississippi Valley, but fortunately are rare in this country.

After a low-pressure area has passed eastward and the storm is over, the wind generally blows from the west. This causes cool, dry weather in summer, and cold snaps in winter. Then it is said that a *cold wave* has come; and this, sweeping over the East, and even far into the South, often does great damage to fruit trees and other delicate plants.

FIG. 30.

A cyclonic storm in Europe which came from the ocean. The heavy black line shows the course followed by its centre. Notice how the winds blow toward the centre.

Cyclonic Storms in Europe. — Europe is also largely under the influence of the prevailing westerlies; and cyclonic storms often cross the ocean and reach far into Eurasia (Fig. 30). There, as here, the extent of the country from which rain may be falling from the clouds of one of these storms is sometimes very great. The weather likewise is made changeable by these storms. That is, in any particular locality it may be warm and pleasant one day, stormy the next, then clear and cool, or cold. Similar cyclonic storms develop in the prevailing westerly belt of the southern hemisphere, where they bring changes of weather to southern South America, Australia, and the islands of the great Southern Ocean.

Sea and Land Breezes; Monsoons. — There is one other great source of disturbance of the regular wind belts of the earth and of the rain belts that are dependent upon them. This is found in the difference in temperature between land and water.

Land warms and cools much more quickly than water. The land along the seashore on a hot summer morning soon becomes warm, and the air above it is heated, as over a stove, so that it expands and grows light; but that over the water remains cool, like the sea itself. This cooler air then pushes in toward the shore; and thus a breeze from the sea, or a *sea breeze*, is created. In summer, such a breeze is frequently felt at the seashore and along the shores of large lakes, and it helps to make the temperature agreeable. At night, the land cools more rapidly than the sea; and then the cool air from the land moves out toward the sea, forming a *land breeze*.

Likewise, in summer the continents as a whole become warmer than the oceans; in winter they become cooler. And in some parts of the world these differences create winds on an enormous scale. Such winds exist in Mexico and that part of the United States bordering on the Gulf of Mexico, but in Asia they are far more important.

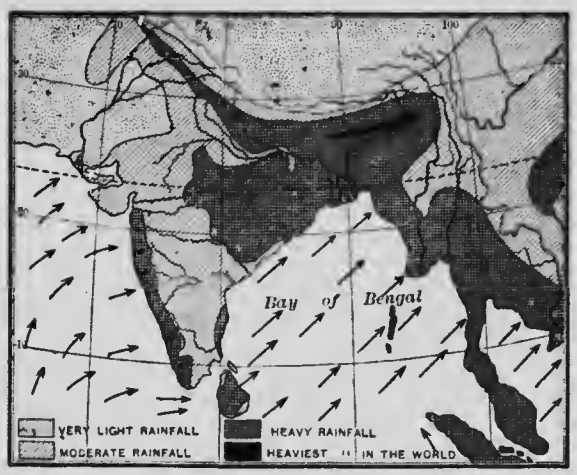


FIG. 31.
The winds and rainfall during the summer monsoon of India.

The interior of that continent is so far from the ocean, that there are naturally very great extremes of temperature. During the winter, the heavy air over the cold land settles down as drying air, and presses outward beneath the warmer air which lies over the ocean. This produces dry land winds. In summer, on the other hand, the air over the cool water crowds in, raises the hot air of the continent, and produces ocean winds and rain. This is well illustrated in the southern part of Asia. Heated by the nearly vertical rays of the sun during the northern summer, the land there becomes warmer than the ocean.

Toward this heated area the cooler air from the Indian Ocean crowds in, causing ocean winds.

This makes the summer winds opposite in direction to those of winter, when the air from the cold lands of interior Asia is flowing out toward the warmer Indian Ocean (Fig. 32). Winds of this kind, which blow in opposite directions in different seasons, are better developed in India than in any other part of the earth, and it was there that they received the name *monsoon* winds. The term monsoon is now applied to inward-flowing summer winds and outward-flowing winter winds of any large mass of land.

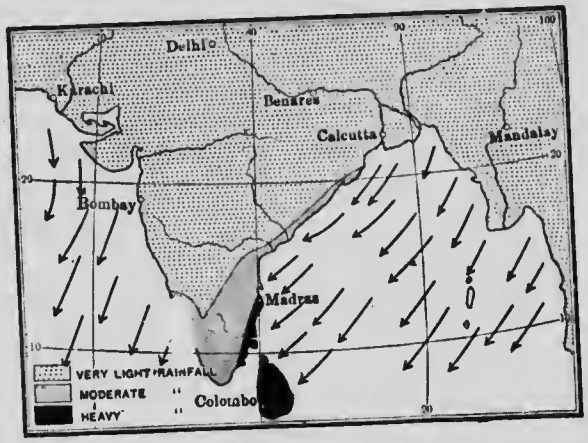


FIG. 32.

Map of the winter monsoon winds and rainfall of India. Compare with Figure 31, and notice especially how very light the rainfall is in one season and how heavy it is in the opposite season.

When the summer monsoons blow, the rainy season comes in India (Fig. 31). The rainfall is especially heavy where the moisture-laden air ascends the steep slope of the Himalayas. In one part of this district, opposite the head of the Bay of Bengal, there is three times as much rain in July alone as falls in well-watered portions of Canada during the entire year. The winter monsoon, on the other hand, is so dry that vegetation withers and the soil becomes parched and cracked, as in a desert (Fig. 32).

While the north and south temperate zones are both called *temperate*, and have many features in common, they are quite unlike in their winds. In the northern hemisphere the broad continents become very hot in summer and cold in winter. Since the temperature of the oceans remains more uniform, the regular winds are greatly interfered with, as by the monsoons. In the south temperate zone, on the other hand, there is little land and a vast expanse of ocean. The temperature of the water changes but little, and the narrow lands have their temperature largely determined by winds from the oceans. In the south temperate zone, therefore, there is little chance for monsoons.

REVIEW QUESTIONS. — (1) Tell about the directions of the regular winds of North America. (2) Describe the circulation of air in a room heated by a stove. (3) Compare this circulation of air with that in the regular winds of the earth.

(4) What effect has rotation on the direction of these winds? (5) What are the names of the regular winds of North America, and over what sections of the continent do they blow? (6) Locate and describe the wind belts of the earth. (7) What proofs have we that these are permanent winds? (8) Tell about the movement of air in the belt of calms. (9) In the horse latitudes. (10) What is the effect of the earth's revolution on the location of all of these belts? (11) Tell about the causes of rain. (12) Show how the trade winds and westerlies affect the rainfall of North America. (13) What about the rainfall in northern South America and in the Hawaiian Islands? (14) How do you account for the Desert of Sahara? (15) Tell about the rainfall in Europe. (16) In South America, just south of the equator, and in Australia. (17) In the belt of calms. (18) Show how the migration of the wind belts affects rainfall, and give an example. (19) Tell about the winds and rain in eastern Canada and northeastern United States. (20) What about the cyclonic storms in Europe? (21) Give the cause of sea and land breezes. (22) Of monsoons. Give example. (23) Why do monsoons interfere with the regular winds much less in the southern than in the northern hemisphere?

SUGGESTIONS. — (1) Estimate the number of barrels of water that falls on an acre of ground, or upon a city block, in one year, where the rainfall is forty inches. (2) How is a movement of air secured in your schoolroom in order to ventilate it? (3) Make a drawing to show the direction of the regular winds of the world. (4) Watch the higher clouds to see in what direction they are moving. (5) Write an account of the change in the weather for five days in succession, — the wind direction and force; the clouds; rain; temperature; and, if possible, the air pressure.

IV. OCEAN MOVEMENTS AND DISTRIBUTION OF TEMPERATURE

LIKE the air, the ocean water is in motion, its three principal movements being wind waves, tides, and ocean currents.

WIND WAVES

Waves are formed by winds which blow over the surface of the water and ruffle it, sometimes, during storms, causing it to rise and fall from twenty to forty feet.

In the open ocean, waves are rarely very dangerous to large vessels; but upon the seashore they do great damage to vessels and even to the coast itself, wearing away the rocks and dragging the fragments out to sea. The constant beating of the waves is slowly eating the coast away.

TIDES

What the Tides Are. — People living upon the seacoast are familiar with the fact that the ocean water rises for about six hours and then slowly falls for the same period. This rising and falling of the water twice each day forms what is known as the **tide**. When it is rising and advancing upon the land, it is called **flood tide**; when receding, **ebb tide**. For a long time men were puzzled to explain this; it was called the breathing of the earth, and by certain uncivilized races it is to this day thought to be caused by some great animal.

The Cause of Tides. — Every twelve hours and twenty-six minutes there is a high or *flood* tide. Twice this period is the time from one rising of the moon until the next, and this fact long ago led people to connect the tides with the moon. The *full* explanation of how the moon produces this remarkable result would be too difficult and would take too much space. Let us try, however, to make it clear by means of an illustration: Suppose a man and a boy to join hands and to whirl about. Each will move in a circle, but the boy's circle will be larger than the man's, because he is so much lighter. Each will feel a pull in his arms, and they must hold fast or they will break apart.

The moon and the earth whirl about in a similar manner, making one turn a month; but as the earth is eighty times as heavy as the moon, the centre about which they circle is close to the earth's centre. It is, in fact, about 1000 miles inside the circumference of the earth. Instead of clasping hands, they are held together by the invisible bonds known as *gravitation.* *See Page 4.* The earth attracts the moon and the moon attracts the earth. Thus the earth is acted upon by two forces, — an attraction or pulling toward the moon, and a pulling away from the moon in consequence of the circling. The pulling away is called the *centrifugal force*, and is well illustrated in the tendency of all loose particles on the circumference of a rapidly revolving wheel to fly off.

The subject will be made clearer by an examination of Figure 32 *A*, where *NM* represents the line about which the earth and moon circle each month. The parallel lines between *BG* and *CH* represent the moon's direct attraction, which does not raise the water at *BC*, but only causes it to become lighter. *NG* and *MH* represent the angular attraction of the moon, which draws the water from the points *N* and *M* toward *BC*, causing it to heap up there in the form of a tide. The heaping up of the water at *EF* is due to the centrifugal force, produced by the circling about *MN*. As the earth also rotates on its axis, in the direction indicated by the arrow, every point on its surface is brought in succession under the moon each day. Consequently every place will have two high tides every twenty-four hours and fifty-two minutes. If the earth did not rotate on its axis, there would be but two high tides a month at any place: one when under the moon, and one when on the opposite side. It is the earth's rotation on its axis that makes possible two high tides daily.

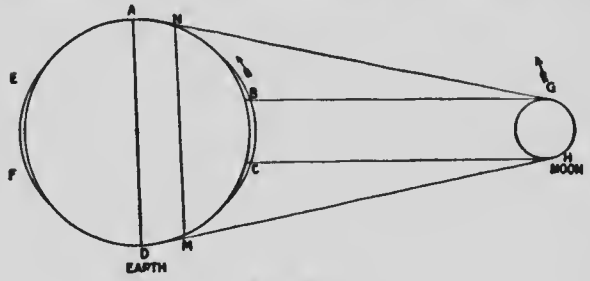


FIG. 32 *A*.
Diagram to illustrate cause of the tides.

Spring and Neap Tides. — Not only does the moon attract the earth, and thus raise a tide, but the sun in a feebler manner, owing to its immense distance, does the same thing. When at new and at full moon, as shown in Figure 32 *B*, the sun and moon are exerting their attraction in the same straight line, the sun's tide is added to the moon's, consequently at the points *A* and *B* a higher

tide than usual is the result. This is known as the **spring** tide, and may be defined as the highest high tide.

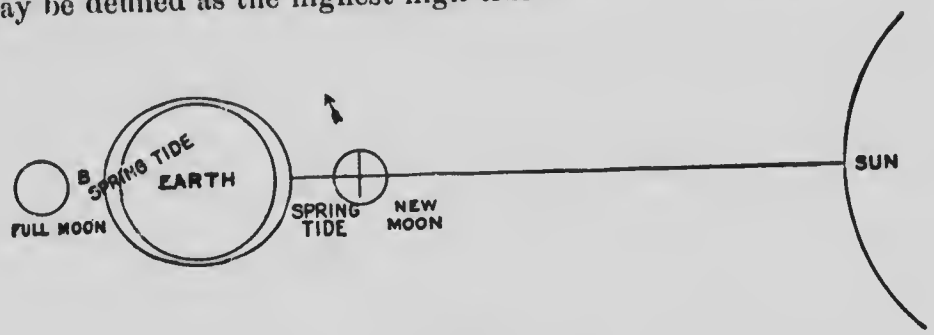


FIG. 32 *B*.
Diagram to illustrate spring tides.

When, as in Figure 32 *C*, the moon is in first or third quarter, and the sun and moon are consequently exerting their attraction at right angles, the tide-producing power of the sun is subtracted from the moon's, which consequently does not raise as high a tide as usual, as shown at the points *A* and *B* in the figure. This is known as a **neap** tide, and is the lowest high tide.

The Height of the Tidal Wave. — The tidal wave is only two or three feet high upon headlands which project into the open ocean,

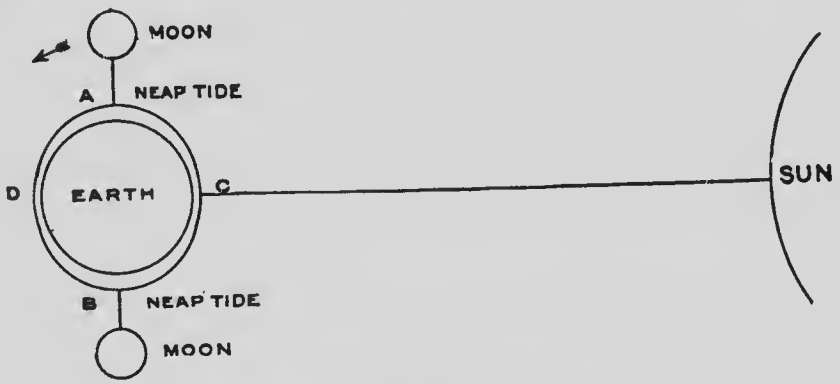


FIG. 32 *C*.
Diagram to illustrate neap tide.

or on oceanic islands ; but it rises a great deal higher in many bays. There the wave is raised higher because the space that it occupies becomes narrower near the head of the bay. In some such coast waters, as in the Bay of Fundy, the tide reaches a height of sixty feet or more.

The Importance of Tides. — (1) Tides, by sweeping in and out

of river mouths, cleanse them by carrying the refuse matter so often drained into them out to the open sea. (2) They are a great aid to navigation, enabling ships at high tide to penetrate to a much greater distance up tidal rivers than would otherwise be possible. This is well illustrated by the port of London, England, which can be reached by large ships only during flood tide. Many of the towns situated on the tidal rivers flowing into the Bay of Fundy are seaports for only a few hours each day.

Ocean Currents

Cause of Ocean Currents. — The winds which blow over the ocean, forming waves, also drive the water before them. You may do this in a small way by blowing on the surface of a pail of water. This starts a current, or *drift*, of surface water in the direction that the air is moving. Where the winds are steady, as in the trade wind belts, or moderately steady, as in the prevailing westerlies, there is a permanent drift of water, pushed along by the prevailing winds. These form the great system of ocean currents (Fig. 36) which have such an important influence on the earth.

The North Atlantic Eddy. — In the eastern part of the Atlantic, where the trade winds blow, the surface water drifts slowly in the direction of the trade winds; that is, toward the belt of calms (Fig. 20). It then drifts westward, as a great *equatorial drift*, until the easternmost extremity of South America interferes with its course. There the drift of water is divided, a part being turned southward, while the greater portion proceeds northwestward.

The part that flows northward is deflected toward the right by the effect of rotation, as the winds are (p. 18); and the part that flows into the South Atlantic is turned to the left, also by the effect of rotation. Therefore, the northern drift, instead of coming near to the mainland of North America, keeps turning to the right, crossing the Atlantic to Europe. It then passes southward, and finally returns to the trade wind belt where it started, having made a complete circuit (Figs. 33 and 36).

Coming from the equatorial region, this water is warm, and in it live countless millions of animals and floating plants. Among the latter, one of the most abundant is a seaweed, called *Sargassum*, which is thrown into the middle of this great eddy. There it has collected until it now

forms a "grassy" or "*Sargasso*" *sea*, hundreds of square miles in extent. Since the "Sargasso" Sea lies directly between Spain and the West Indies, Columbus was obliged to cross it on his first voyage of discovery; and his sailors, upon entering it, were much alarmed lest they might run aground, or become so entangled in the weed that they could not escape.

The Gulf Stream. — A portion of the drift of water which moves northward along the northern coast of South America enters the Caribbean Sea and then passes into the Gulf of Mexico. This is a

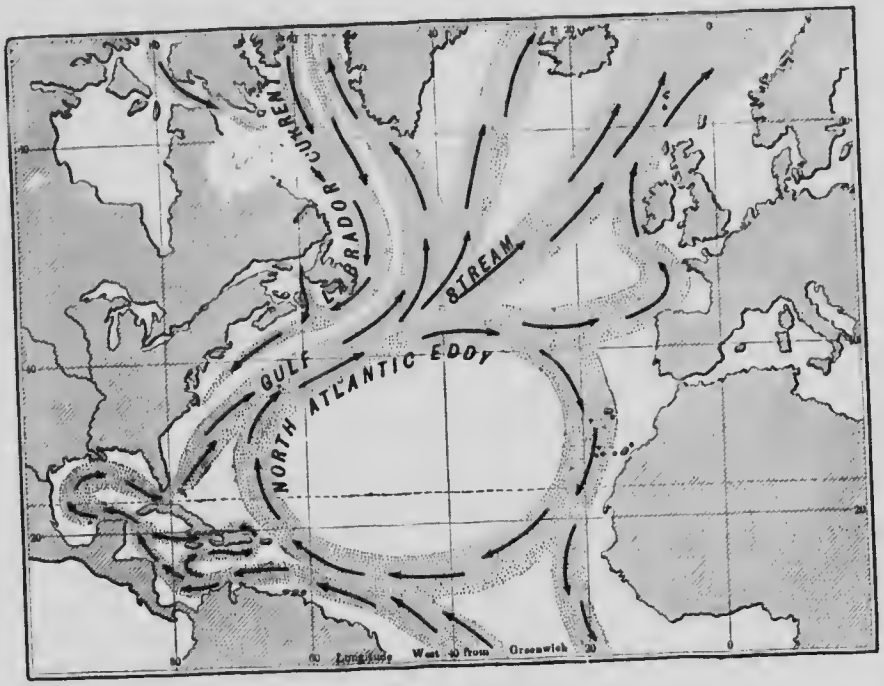


FIG. 33.

A diagram to show the currents of the North Atlantic. In order to illustrate the currents clearly it has seemed necessary to make them as if they were sharply bounded, like a river in its channel. As a matter of fact, however, the boundaries of these great currents and drifts are so indefinite that, in crossing them, one would not be able to detect the boundaries even by using the greatest care.

broad, deep, gently flowing current; and it is so nearly surrounded by the warm tropical lands that it grows even warmer than when it entered the Caribbean. After swirling round the Gulf of Mexico, it escapes between Cuba and Florida, after which it is known as the *Gulf Stream* (Fig. 33), because it comes from the *Gulf* of Mexico. Being forced to pass out through so narrow an opening, its rate of movement is much increased — even to four or five miles per hour — as water in a hose is made to increase its speed by passing through

the nozzle. Measure on the map of North America the distance from Key West to Havana.

Being turned to the right by the effect of the earth's rotation, the Gulf Stream soon leaves the American coast and flows northeastward toward northern Europe. It broadens rapidly and joins forces with the western part of the great Atlantic eddy. In crossing the Atlantic, the drift is pushed along by the prevailing westerlies, so that it reaches the shores of northern Europe, and even enters the Arctic Ocean. Some idea of its volume may be gained from the fact that it carries many times as much water as all the rivers of the world.

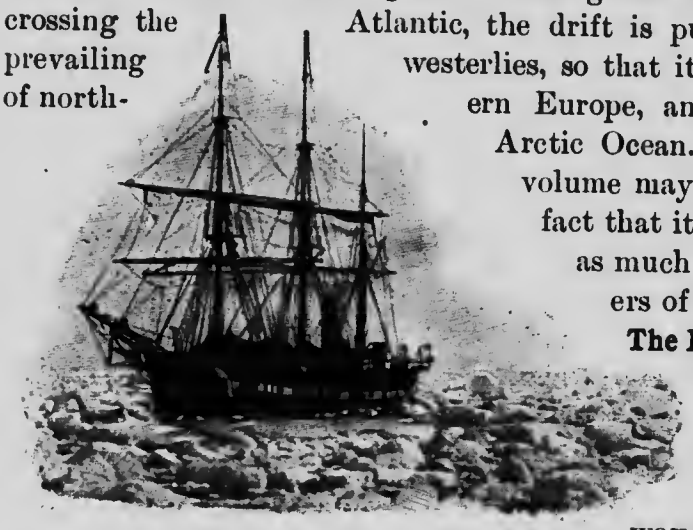


FIG. 34.

An Arctic whaling steamer imprisoned, off the coast of Baffin Land, in the floe ice which is being carried southward in the Labrador current.

The Labrador Current. — After being cooled, some of this water settles to the bottom and finds its way back to the torrid zone in the slow drift of cold water which is forever moving along the ocean bottom from the frigid zone toward the equator. But much of it returns at the surface, for there is a cold surface current, called the *Labrador current*, passing southward along the northeastern coast of North America (Figs. 33, 34, and 36).

The Labrador current flows down from among the islands of North America, past the coast of Labrador, Newfoundland, Nova Scotia, and the New England States as far as Cape Cod. Like all ocean currents in the northern hemisphere, it is turned toward the right, that is, since it flows southward, toward the west. This causes it to follow the coast very closely, keeping nearer the shore than the Gulf Stream does.

Since there are two currents near together, a cold one from the north, and a warm one from the south, a vessel sailing from St. John or Halifax to England must cross both. During winter storms a ship often becomes covered with snow and ice while in the cold Labrador current, but loses this coating soon after entering the Gulf Stream.

Where the cold and warm currents come near together, a dense fog

is produced. You can doubtless explain why that is so. Sailors who cross the Atlantic have learned to expect heavy fogs as they pass near the coast of Newfoundland, which is one of the foggiest regions in the world.

The Currents in the North Pacific Ocean. — In the Pacific Ocean, as in the Atlantic (Fig. 36), the water drifts westward in the belt of calms; then a broad, warm current swings to the right past Japan, crossing the ocean toward Alaska, as the Gulf Stream crosses the Atlantic toward Europe. This is called the Japanese current. Continuing to turn to the right, this great ocean drift passes southward to complete the vast eddy.

A small branch of the current turns northward along the Alaskan coast. There is also a cold current between the Japanese current and the coast of Asia, corresponding to the Labrador current in the Atlantic.

We see from what has been said, that, although the Gulf Stream flows past the Southern States, the northeastern coast of North America and of Asia are bathed by ocean currents from the cold north. On the other hand, the northwestern coasts of Europe and North America are approached by warm drifts of water from the south.

Eddies of the Southern Oceans. — In the South Pacific, South Atlantic, and Indian oceans, the same causes have produced eddies similar to that of the North Pacific; but here the earth's rotation deflects the winds to the left, as we know, and the waters are moved in the same direction. Some of the water at these eddies joins the broad West Wind Drift of the distant southern ocean; but much of it turns northward until it once more reaches the trade wind belt, thus completing the eddies (Fig. 36).

Effects of Ocean Currents in North America: Review. — The cold Labrador current greatly affects the temperature upon the land, for winds blowing over it carry the chill far inland. This is one of the reasons why the east winds of our Eastern provinces are so cool, and why the coast is such an agreeable summer resort.

Since the Labrador current flows as far south as Cape Cod, the water north of this promontory must be cooler than that south of it. As the cold current leaves the Arctic region, it bears with it much sea ice which has been frozen during the preceding winters (Fig. 34), and also gigantic icebergs which have broken off from the Greenland glacier. It is upon this drifting ice that the polar bear spends much of his time hunting for seals, which live in great numbers in the ice-covered waters (Fig. 35).

The icebergs may be carried southward one or two thousand miles before the air and water melt them away (see limit of icebergs on Fig. 36). Indeed, some icebergs float even as far south as the paths followed by vessels which cross the Atlantic. Since many bergs are larger than the greatest building in the world, collision with one means shipwreck; therefore sailors need to use great caution, especially when the ship is in the fog.

The cyclonic winds from the *Gulf Stream* greatly temper the climate of eastern North America, while at the same time they bring to us much vapor gathered from over these warm waters.

The warm currents of the Pacific Ocean render the southern part of Alaska far warmer than southern Labrador, which is farther

Fig. 35.

Polar bear and seal on the floe ice of the Labrador current.

south; and the prevailing westerlies bring an abundance of vapor to the Pacific coast all the way from California to Alaska. Where these winds blow, the winters are mild and the rain heavy; but the summers are cool and pleasant, because the ocean water, though warm, does not become greatly heated. Notice on a globe that southern British Columbia, with its pleasant climate, is about the same distance from the equator as the island of Newfoundland, the shores of which are bathed by the cold Labrador current.

Effects on Other Regions. — The Gulf Stream drift is of special benefit to the Old World. It has been estimated that its waters carry one-half as much heat into the Arctic as reaches it from the

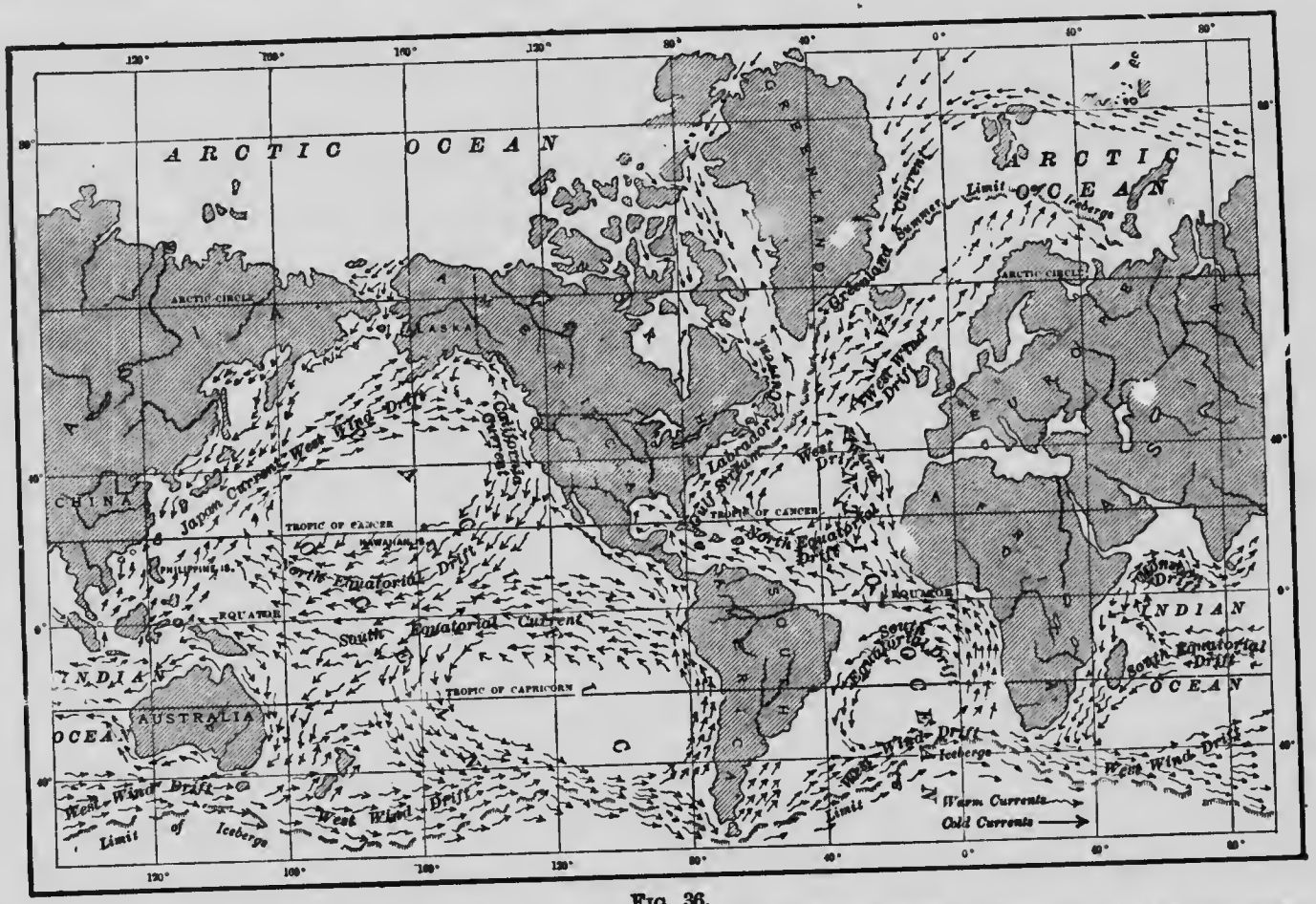


FIG. 36.

A chart showing the principal ocean currents and ocean drifts of the world. Study this map carefully. Make a sketch map somewhat like it. Compare the direction of the currents with that of the winds in Figure 20.

direct rays of the sun. When Nansen started on his famous journey toward the north pole, he entered the Arctic Ocean with this current. Thus, since its warm water keeps that part of the Arctic free from ice in summer, he was able to proceed much farther than he otherwise could have gone. Owing to this warmth, Russia is able to have a harbor on the very shores of the Arctic. Name it. Westerly winds, warmed in passing over this drift, have made possible the great civilized nations of northern Europe, notably our own mother-country.

Notice on a map how many large cities are in that part of northern Europe which is the same distance from the equator as desolate Labrador. What a striking contrast these nations present to the scattered savages of the latter dreary country, whose winds come either from the land or over *cold* ocean water.

When the first settlers came to North America from France and England they expected to find in the New World a climate like their own in the same latitude. They were unprepared for the severe winters which they actually found, and thus the first settlements on the Canadian and New England coasts were failures.

Besides thus influencing so much of the earth, the Gulf Stream, like other warm currents, has helped to form a great number of islands. Where warm currents flow, the water is often warm enough for corals to live; and, since the moving water brings to them an abundance of tiny animals for food, colonies of corals flourish, and their skeletons gradually form reefs. In this way the southern half of Florida, the Bahamas, the Bermudas, and many of the islands in the South Pacific, were built.

The cold current on the northeast coast of Asia affects that region much as the Labrador current affects northeastern North America. Its winds chill the Siberian coast, and cause the harbors, like that of Vladivostok, to be icebound in winter. This explains the efforts made by Russia to hold the Chinese harbor at Port Arthur, south of Korea — that her commerce and warships might not be shut up in winter.

Distribution of Temperature

In general, it is true that the farther north we travel from the equator, the colder it grows; but this is by no means always the case. If the earth were made of one solid, level substance, like glass, the temperature *would* gradually decrease from the equator to

the poles. Then all points the same distance from the equator, as all on the Tropic of Cancer, or all on the Arctic Circle, for instance, would have the same temperature.

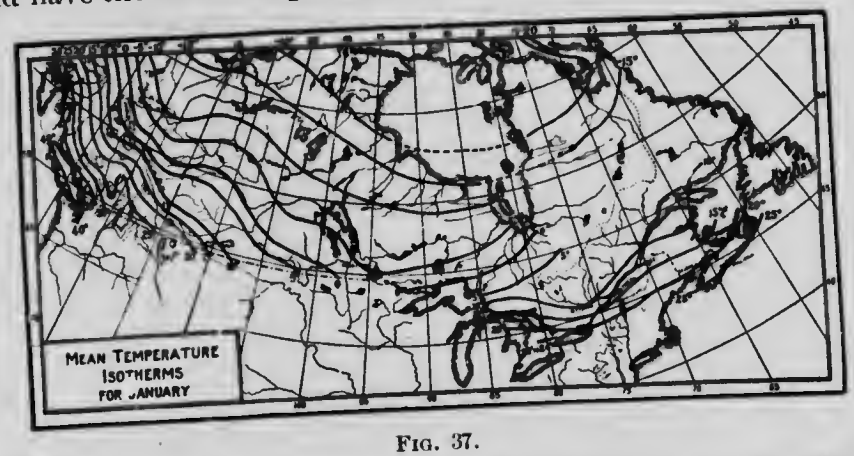


FIG. 37.

Isothermal chart of Canada for January. Why is it colder in the interior than on the east coast? Why so warm on the west coast? Can you notice any influence of mountains?

But we have seen that there are several causes which interfere with this regular decrease in temperature toward the poles. For example, (1) high mountains have a cold climate, even though in the torrid zone; and, for the same reason, plateaus may be colder than lowlands far north of them.

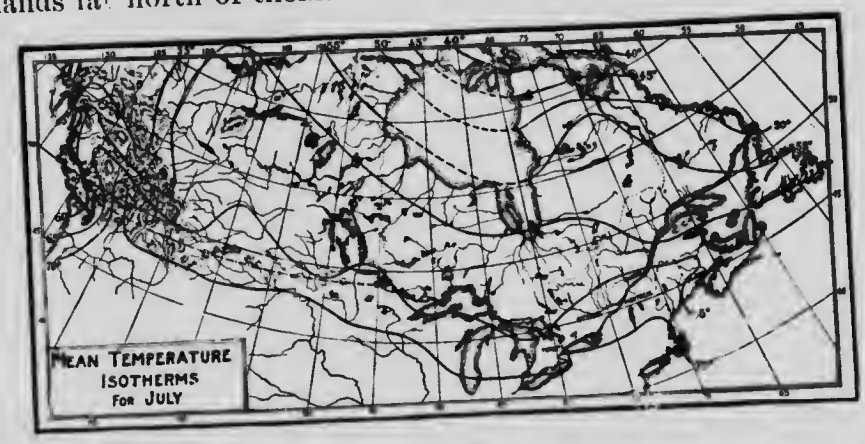


FIG. 38.

Isothermal chart of Canada for July. Notice the influence of the Rocky Mountains. Why is it cooler on the west coast than on the east coast? What makes the isotherms bend southward from the Mackenzie to Ontario?

Besides that, (2) land warms and cools much more rapidly than water (p. 32), so that land becomes hotter in summer and colder in winter than the ocean. Thus, in Manitoba, far from the coast, the

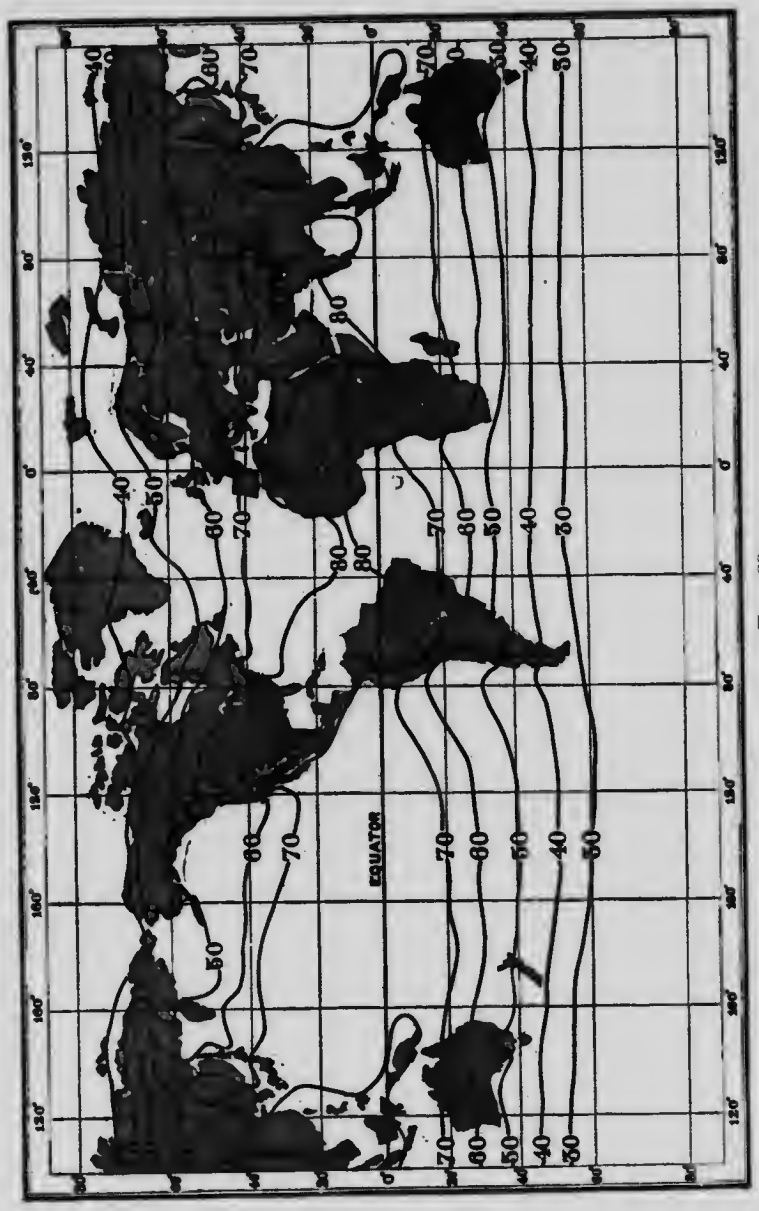


FIG. 39.
An isothermal chart of the world for July.

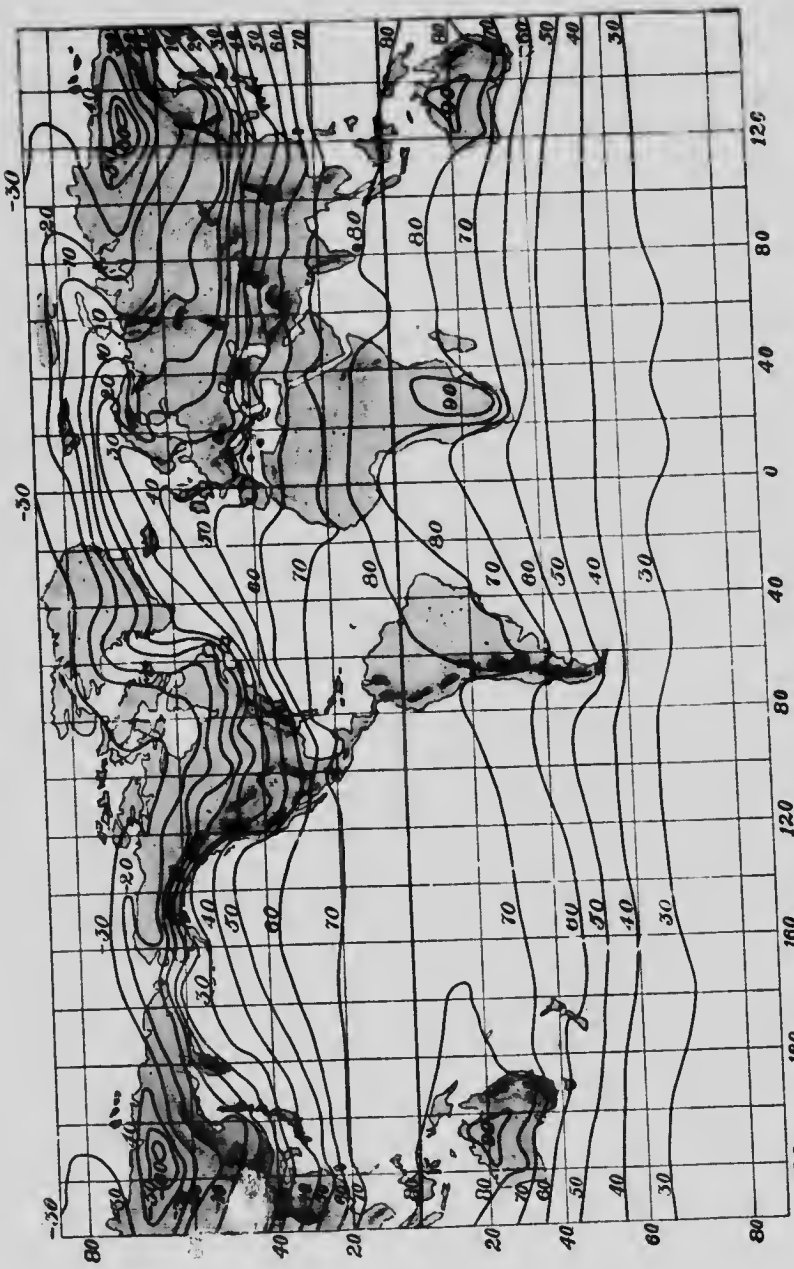


FIG. 40.

An isothermal chart of the world for January.

average temperature in January is below zero, while in July it is about 65° (Figs. 37 and 38). In Halifax, on the coast, the average in January is about 20°, and in July not quite 70°. On the west coast, in British Columbia, where the winds are blowing from the ocean, the average temperature for January is 35°, and for July 60°.

At Key West, Florida, which is surrounded by water, the average temperature in January is about 70°, and in July about 85°. Where the temperature changes so little, the climate is said to be *equable*.

The winds (3) greatly influence the temperature. Where they blow from the ocean, they cause an equable climate, as in British Columbia, near Victoria; but where they blow from the land, they are cool or cold in winter and warm in summer. This is true of the eastern United States, where most of the winds blow from the land, though some of the damp winds come from the ocean.

Another cause (4) for different temperatures at places equally distant from the equator is found in the ocean currents. We have just seen that the Gulf Stream drift warms the air, while the Labrador current cools it, and thus by winds from these waters the temperature is affected over a very wide area.

If, therefore, we were to draw a line across the continent, connecting several points that have the same average temperature during any one month, or during the entire year, it would need to be a very crooked one, with some parts reaching much farther north than others. Such lines tell so much about temperature in so little space that it is the custom to make maps to show them, as in Figures 37 and 38. Since the lines connect the places having the same temperature, they are called *isothermal lines* or *isotherms*. (The first part of the word means *equal*, and the latter part *heat*.) A map or chart showing the isotherms is called an *isothermal chart* (Figs. 37 and 38). Trace several of the isotherms across Canada, and explain why they bend as they do.

Note that on the western coast the isotherms extend northward and southward almost parallel to the coast, since the prevailing westerlies bring to the land the nearly uniform temperature of the Pacific. There is only about 20° difference between winter and summer temperatures on the western coast of North America. But on the eastern coast of the continent the difference between summer and winter is much more marked, because, while some of the winds are from the ocean, still more are from the land, which is cold in winter and warm in summer.

Figures 39 and 40 show similar isotherms for the world. Observe how these bend toward the equator where they cross mountain chains. Comparing these two figures, you will notice how the winter isotherms of the north temperate zone bend *toward* the equator over the continents, for reasons given in (2) above. During the summer, on the contrary, the isotherms curve poleward. On what continent are these bends most striking? Why? Explain the effect of the Gulf Stream drift as shown in Figure 40.

The reason is evident why the isotherms of the North Atlantic are close together as they leave America, but spread apart like a fan toward the Old World. On the American side the currents approach each other, one from the north bearing Arctic cold, the other from the warm south. This causes great temperature contrasts between the northern and southern coasts of North America. On the European side one part of the ocean drift passes northward, raising the temperature and bending the isotherms far northward. The remainder turns southward and, being somewhat cooler than the region into which it enters, slightly lowers the temperature and bends the isotherms southward. Thus the isotherms are spread apart.

REVIEW QUESTIONS. — *Waves and Tides.* — (1) Of what importance are the waves? (2) How often does the tide rise and fall? (3) What causes it?

Ocean Currents. — (4) Explain how winds help to produce ocean currents. (5) Describe the drift of tropical waters in the Atlantic. (6) Trace the drift which passes outside of the West Indies to the European coast. (7) Describe the Gulf Stream. (8) Describe the Labrador current. (9) Trace the currents in the North Pacific. (10) What coasts mentioned are bathed by warm currents? By cold currents? (11) Tell about the eddies in the southern oceans. (12) In what ways is the Labrador current of importance? (13) What influence has it in North America? (14) What is the influence of the Japanese current? (15) Tell about the influence of the Gulf Stream on the Arctic Ocean. (16) On Europe. (17) On the building of coral islands. (18) What is the effect of the cold current flowing along the northeast coast of Asia?

Distribution of Temperature. — (19) What about the change in temperature from equator to poles, if the earth were a round ball of glass? (20) How is this change interfered with? (21) What is an isothermal line? (22) An isothermal chart? (23) Relate some facts about the isothermal lines for Canada. (24) About those for the world.

SUGGESTIONS. — (1) If your home is upon the seacoast, find out about the high and low tides for several days in succession. (2) Notice the relation between the height and the time of high tide, on the one hand, and the changes in the moon, on the other. (3) Does the government spend money near your home to remove materials which the tidal currents have brought? (4) What course might a vessel take in order to be carried from Europe to America and back again by ocean currents? (5) What precautions do vessels take to avoid running into one

another in dense fogs? (6) How do they try to avoid collisions with icebergs? (7) Learn more about Nansen's voyage. (8) Which of the isothermal lines on Figures 36 and 40 is nearest to your home? (9) What isotherm runs near Sault Ste. Marie and Edmonton? Near Toronto and Calgary? Through southern Ontario and northern British Columbia? (10) What isotherm extends through southern Ontario and Alberta? (11) How about the distance of these points from the equator? (12) Does the presence of a warm or cold current near a country necessarily greatly affect the climate of that country? (13) Locate the cold ocean currents of the world; the warm currents. (14) Estimate the length of the circumference of the great eddy in the North Pacific. (15) How does Figure 38 show the effect of the cold current on the northeastern coast of Russia? (16) Why are the isotherms so much more nearly parallel in the southern hemisphere than in the northern? (Figs. 39 and 40.) (17) Only about one-fourth of the earth's surface rises above the water. What might be some of the effects if the quantity of land were greatly increased? If it were greatly decreased?

V. PEOPLES

Fig. 41.
An African negro girl.

Divisions of Mankind. — Man, like plants and animals, varies in different parts of the world. He is influenced by his surroundings as they are, and in the course of time has developed differently in the various lands of the earth. Concerning the *origin* of the human race, and its divisions, people hold different views; but mankind in general may be divided into four great groups.

Ethiopians. — Altogether there are about one and one-half billion human beings upon the earth, or two hundred and fifty times the number in Canada. Of these the lowest are the negroes (Figs. 41 and 42), or *Ethiopians*, who number about one hundred and seventy-five million. This is often called the *black race*. There are many subdivisions of this group, but they are all characterized by a deep brown or black skin, short, black, woolly hair, broad, flat noses, and prominent cheek bones.

The home of the Ethiopians is Africa, south of the Sahara desert (Fig. 45), though many have been transported to other lands as slaves, and have there mingled more or less with the other races. In their original home the negroes are savages, or barbarians of low type.

Fig. 42.
A native of New South Wales, Australia.

The native Australians (Fig. 42), the Papuans of New Guinea, the Negritos of the Philippines, and the blacks on some other islands in that part of the world resemble the negroes most closely, though differing from them in some important respects. They are shorter, for example; their hair is less woolly, their noses straighter, and their lips less thick.

American Indians. — A second great division of the human race is that of the *American Indians*, often called the *red race* (pp. 85–87). It is the smallest of the four groups, numbering about twenty-two million. These people, who in some respects resemble the Mongolians, were in possession of both North and South America when Columbus discovered America. They are distinguished by a copper-colored skin, prominent cheek bones, black eyes, and long, coarse, black hair (Fig. 75).

Fig. 43.
Japanese ladies.

Mongolians. — The third division, the *Mongolian* or *yellow race*, numbering about five hundred and forty million, are typically Asiatic people, the greater number being found in Asia and the islands of the Pacific (Fig. 43).

The Mongolians typically represented by the Chinese and Japanese (Figs. 43 and 347), have a yellowish, or in some cases even a white skin, prominent cheek bones, small oblique eyes, a small nose, and long, coarse, black hair. In places, as in the more remote islands, the Mongolians are uncivilized: but the great majority may be classed as civilized people, although their standard of civilization differs from that of the white race.

Caucasians. — By far the largest and most civilized of the four divisions of mankind is the *white* or *Caucasian race*, which numbers about seven hundred and seventy million. Their original home is

not known. With the dawn of history the white peoples of Europe were mostly barbarians; but civilization had begun to develop in southern and western Asia and along the shores of the Mediterranean Sea.

While for various reasons the Caucasians differ greatly in characteristics, two main branches are recognized: (1) the fair type (Fig. 299), with florid complexion, light brown, flaxen, or red hair, blue or gray eyes, and height above the average; (2) the dark type

FIG. 44.

A group of Indian Brahmins, who belong to the dark type of Caucasians.

(Fig. 44), with fair skin, dark brown and black hair, often wavy or curly, and black eyes. In temperament both are active, enterprising, and imaginative, though the fair type is more stolid, the dark type more emotional.

Distribution of Races. — For centuries these four great divisions of the human race have been changing within themselves until there are now many subdivisions of each group. By war and invasion they have encroached upon one another, and have intermixed to some extent. But the leaders are the whites, who, having learned the use of ships in exploring distant lands, have spread with a rapidity never seen before. Also, being more advanced than the

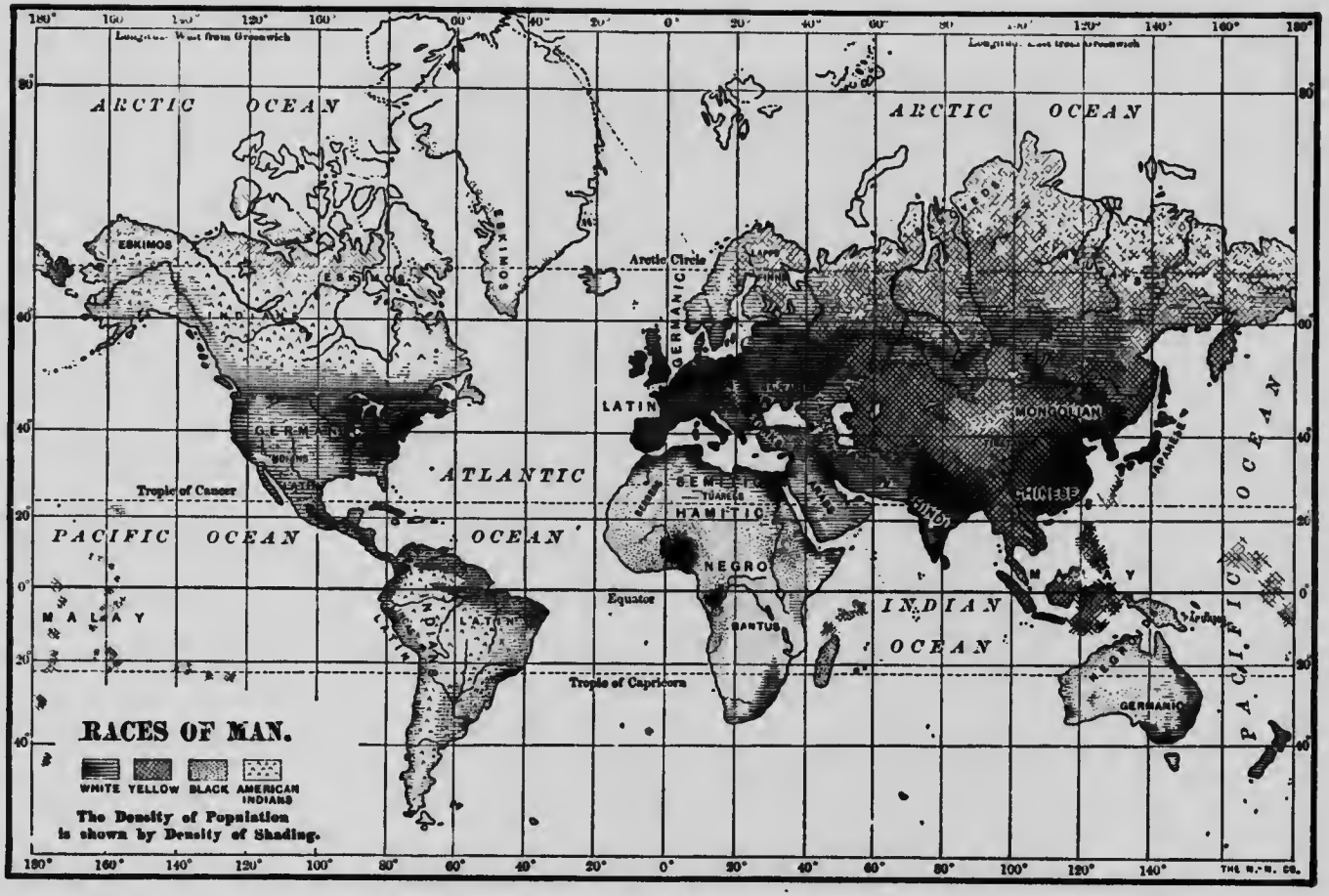


FIG. 45.

Make a sketch map similar to this to show the general distribution of the four races of man.

others, the white races have readily conquered the weaker people and taken their lands from them. They now dominate the world (Fig. 45), the only division that has held out against them being the Mongolians, whose very numbers have in large measure served to protect them.

Distribution of Religion. — Every race has some form of religion, Among savages it is little more than superstition. They are surrounded by nature, which they do not understand. They seek a cause, and, seeing none, are led to believe in spirits which they try to comprehend. Some they suppose to be evil, others good. Believing that these spirits have great influence over their lives, they try to win favor with them by offering sacrifices and worshipping them.

Fig. 46.
A fetish from Africa.

Such religion, if it may be so called, takes many forms. Some races, as the negroes, believe in witchcraft; and among them the witch doctor is sometimes more powerful than the ruler himself. To ward off evil influences charms are worn, gross rites are observed, and images or objects, called *fetishes* (Fig. 46), are worshipped because they are believed to possess magic power. Among these objects are included fire, the sun, the earthquake, and many animals. So far as the idea of God is concerned, if these people have any conception of Him, it is of the crudest kind. The negroes, the Indians, the Eskimos, and even our own ancestors a few thousand years ago, had little more than this form of religion.

All people with such views as the preceding are called *heathens*, and are often said to have no religion at all. From our point of view they have no *true* religion; but they have something akin to it.

Among the semi-civilized and civilized races there are forms of belief in which the conception of God is higher, and the idea of future reward and punishment is taught. Of these religions five call for special mention.

Buddhism, followed especially in eastern Asia, was established in India five or six hundred years before the time of Christ as a result of the work and teachings of Buddha (Fig. 47). But there are many differences in the religious beliefs and customs of the Asiatic people, and in consequence there are many sects. *Brahminism* is one of the most common forms of belief, being especially followed in

India. It would be difficult correctly to describe the religions of the Asiatic people in a few words; but *idolatry*, or the worship of idols, is prevalent among them. *Ancestor worship* is common in China; and the *doctrine of caste*, in India, — that is, the doctrine of class distinction. Both of these doctrines, which are a part of their religion, are opposed to progress, as we shall see.

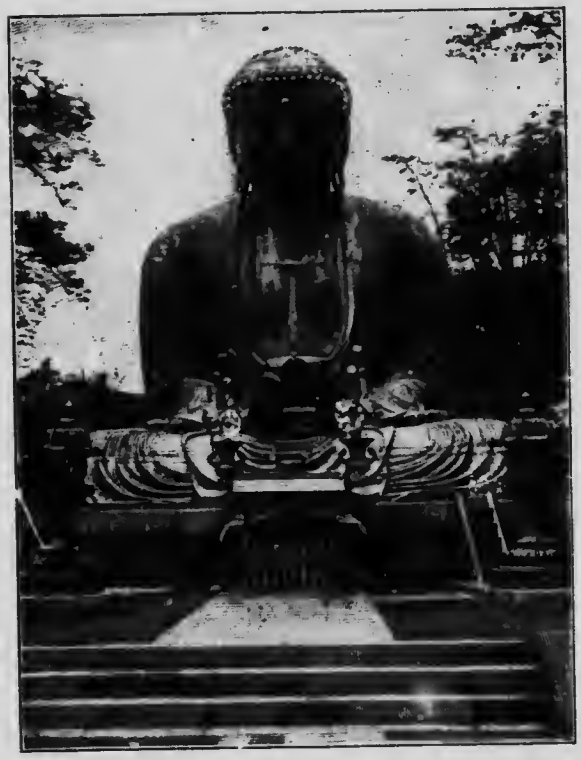


FIG. 47.
A statue, or idol, of Buddha in India.

The *Jewish* religion, still followed by many, upholds the worship of one righteous God, as taught in the Old Testament. From this, two other religions have developed, *Mohammedanism* and *Christianity*. The prophet Mohammed lived about six centuries after Christ, and the *Koran* contains his teachings. Mohammedans deny the divinity of Christ. This religion has been spread by the sword with wonderful rapidity, especially among the semi-civilized people of Asia and Africa. Many of its followers became fanatics who, believing that they thus obtained future happiness, willingly died if they could die killing a Christian.

The Christian religion, the common belief in America and most of Europe, has spread slowly, but it now numbers about four hundred and forty million followers. Its success, however, must not be measured by numbers alone; for Christians make up most of the really civilized people of the world. It is no accident that this is so, for Christianity has been one of the chief factors in making civilization possible.

Religious belief has had much to do with inventions and the growth of industry. The Chinese, for example, have long opposed new inventions because their ancestor worship cultivated undue

reverence for past customs; also they have been unwilling to dig into the ground, for fear of disturbing the evil spirits that are supposed to dwell there. Partly for such reasons, our study of geography is chiefly concerned with Christian countries; for there we find the most varied and extensive uses of the earth in the service of man.

REVIEW QUESTIONS. — (1) Tell about the Ethiopians; their characteristics and distribution. (2) Do the same for the American Indians. (3) Mongolians. (4) Caucasians. (5) Give reasons for the greater advance of the Caucasians. (6) Tell about the distribution of religion. (7) Give some facts about heathens; Buddhism and Brahminism; Jewish religion; Mohammedanism; Christianity.

SUGGESTIONS. — (1) What members of the divisions of mankind — other than whites — have you seen in your own neighborhood? (2) What different nationalities of whites? (3) Find pictures illustrating human life in the various zones. (4) Help to make a collection of pictures for the school, to illustrate the various forms of shelter and clothing. Also find such pictures in this book. (5) Find some one who has specimens of primitive implements, as Indian arrow-heads, and examine them. (6) Find out something about the ways in which savage races ornament their clothing and person.

PART II

NORTH AMERICA

I. PHYSIOGRAPHY OF NORTH AMERICA

A General View of the Continent. — Suppose for a moment that we were seated on the surface of the moon and were looking toward that part of the earth upon which we are now living, what kind of a picture would we see? We would see North and South America, two immense blocks of land connected by the narrow Isthmus of Panama or Darien, much the same as they appear in Figure 48. Observe in this picture that North America has a distinctly triangular shape. As we look more closely we will notice three great highlands bordering the west, the southeast, and the northeast sides of the continents. These are known as the Rocky or Cordilleran, Appalachian, and Laurentian plateaus. We may also observe that the triangle is broken on the southeastern and northeastern sides by two great arms of the Atlantic, that of the Gulf of Mexico and that of Hudson Bay.

Fig. 48.

North and South America.

Looking at the great solid mass of the North American continent, we find it hard to believe that it has grown to its present shape and size from what in the long ago were simply three clusters of islands separated from each other by wide seas. Let us try to picture the history of this growth.

FIG. 49.
The beginnings of the North American continent.

The Growth of the Continent. — There are about one hundred million persons in North America at the present time, although a century ago there were scarcely one-tenth of that number. This wonderful growth has been largely due to the useful and valuable mineral products of the earth; to the soil and climate which have allowed many different kinds of plants and animals to thrive; and to the rivers, waterfalls, lakes, and harbors which have made manufacturing and shipping easy.

FIG. 50.
The development of the North American continent.

As it takes time to build a house, and to prepare the boards from trees, the nails from iron ore, and the bricks from clay, so it takes time for the formation of minerals and rocks and for the building of a continent. In fact, millions of years have been required for that work.

The story, telling how North America was made, is a very interesting one. It has been discovered by a careful study of the rocks; and although there are many questions that no man is yet able to answer, we are prepared to tell a part of the story.

At one time the earth was probably a white-hot sphere like the sun; but in time the outside cooled to a crust of solid rock. The interior, still heated, continued to shrink and grow smaller, as most substances do when cooling. This caused the solid crust to settle and wrinkle, much as the skin of an apple does when the fruit is drying. Water collecting in the depressions formed the oceans, while between them, where the elevation of the earth's crust was greatest, rocks appeared above the sea level. Thus North America and the other continents were born.

In its babyhood, when the folds of the earth's crust began to break through the surface of the waters, they did not appear as we now behold them, in the form of a great united land, but as groups of islands of various sizes, the greater mass occupying the region about Hudson Bay (Fig. 49). If those who have made a careful study of the growth of our continent are correct, what does Figure 49 mean? It means that about the northeastern portion of the present continent the beginning of that continent made its appearance. Along the lines where now lie the Rocky Mountains of the west and the Appalachians of the east, stretches of islands alone showed where the present great plateaus were to be placed. Figure 49 also shows that at that distant day the great plains enclosed by the three great mountain systems were still below the waters, and that the continent, though but very incomplete, had laid down its great outlines. From this time forward growth was steadily increasing. The original group of islands rose higher and higher from the sea, and pushed forward their shores so as to win more and more of the shallow sea bottoms and convert them to dry land. Where was the Gulf Stream all this time? Is it not possible that it swept up what we now call the Mississippi Valley, carrying its heated waters to the Arctic Ocean at the north? If this were the case, is it any wonder that immense quantities of limestone rocks are now found along this great valley?

As time passed, the continents took on more closely the form of Figure 50. Here the Laurentian and Appalachian plateaus by blending with each other formed many of the features now peculiar to eastern and northern America. The Rocky Mountain plateau became wider and longer, but was still separated from the eastern mass by a long and shallow sea. The continent continued to increase in size, the dividing waters changed to shallow lakes separated by great stretches of marshy lands; these lakes finally vanished, the southern

portion of the Mississippi Valley was built up and the continent stood out much the same as it does to-day.

The Coal Period. — The slow upward growth of the continent brought wide areas of sea first into the condition of shallows and finally into dry land. When the land first appeared above the waters, it was low. Indeed, much of it that has since been raised into great plateaus and mountain chains was then in the condition of broad plains. As the climate of this period was made very moist by an abundance of rainfall, extensive swamps covering all the low-lying grounds were filled with a dense mass of vegetation related to the ferns and rushes that we now have (Figs. 51 and 52).

FIG. 51.

The way the coal swamps appeared, so far as we can tell from the fossils which have been preserved.

When the plants died, they fell into the swamp water, thus making a woody matting which did not fully decay and which as time went on completely filled the swamp. Were this vegetation dug up from the swamp bottom and dried, it would have made fairly good fuel. Indeed, it is now the custom in Ireland and other cool, moist lands to remove material of this nature from the bogs and dry it, forming *peat*, a fuel used for cooking and heating purposes in many homes.

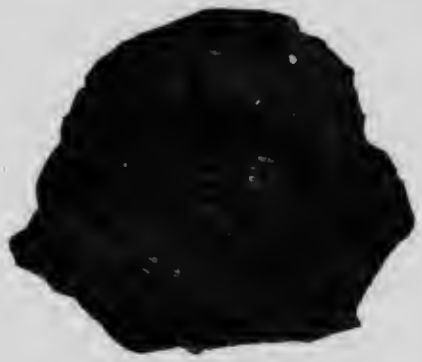


FIG. 52.

Rock containing a fossil fern which grew in the swamps of the coal period.

As the crust of the earth shrunk and wrinkled, the land was consequently raised and lowered. Even to-day the land is slowly moving in some places, and it was doing the same thing when the continent was younger. As a result of this raising and lowering of the earth crust, swamps which had been receiving the dead vegetation of hundreds of years sank beneath the sea, and were covered by the mud, sand, and gravel which were washed from the shores, and which have since been hardened into rock.

After another long period, the sea bottom again came above the waters, and the dense vegetation of the swamps returned, but this time the plants grew with their roots in the ocean mud which had buried the earlier swamp. After many more years the plains sank again, and the swamp vegetation was covered as before. This happened in some districts many times, one series of vegetation, soil, and rock being followed by another until many such layers were formed (Fig. 53).

Fig. 53.

The woody material that gathered in the swamps grew to be scores of feet in thickness, but on being covered up it was pressed more tightly together. As the number of layers increased, causing the pressure to become very great, the stored-up vegetation slowly changed to coal, making beds that are often from six to a dozen feet in thickness.

There are many varieties of coal. Some of the poorer coals, known as *lignite*, are little better than peat beds. Other coal, called *anthracite*, formed especially in portions of the Canadian Rockies and in the mountains of Pennsylvania, has been changed so greatly that it is as hard as some rocks, and is known as hard coal. Most of the coal mined, although quite like a mineral, and harder than lignite, is not so hard as anthracite. This is called soft or *bituminous* coal, and is found in Nova Scotia, in the Central States, and in parts of western Canada.

All this time, and at other periods during the upbuilding of our continent, iron, copper, gold, silver, building-stone, and other materials needed now every day, were also being slowly formed and preserved in the rocks, but we cannot now tell their story.

The Plateaus and the Mountains. — During the millions of years that the continent was growing to its present form there were rising in the northeast, east, and west, mountain systems and surrounding plateaus that were to have a great influence upon our climate, and therefore upon our crops, our animals, and ourselves. After the coal period had drawn to a close, the period of plateau-making and mountain-building began, and resulted in the elevation of the Appalachian highlands, and afterward in the rearing of the huge mass of the Cordilleras or Rockies. The Laurentian plateau

was raised almost in the babyhood of the continent. This plateau, no doubt, was as huge and as massive in its prime as are the Rockies to-day. Since that time, the rains and the snows, the summers and the winters, have helped to wear away so much of the former plateau that what is left is but a shadow of what once was. From this ancient plateau, however, have come the sands and the mud which helped to build up the plains to the west and south.

The Appalachians, too, are very old and much worn. At present these mountains are neither very high nor very rugged, though they have some peaks which reach more than a mile above the sea. The western mountains, being the youngest of the three great systems, are less worn, are more rugged, and have peaks rising three miles and more above the sea level. At the base of the Appalachians is a narrow plateau supporting the mountains. This plateau is rarely more than fourteen hundred feet in height, whereas the Cordilleras tower above a broad plateau which is itself more than a mile in height, or as high as the mountain peaks of the eastern highlands.

Fig. 54.

A small picture of the West Indian region as it would appear if the ocean water were removed. Notice that the islands rest on a lofty ridge rising from the ocean bottom.

There is one mountain system connected with our continent which is yet so new and so imperfectly elevated that it gives rise to many groups of islands, which we have called the West Indies. These islands are really the highest parts of a fourth mountain chain. They seem to be separated only because the foundations upon which they rest do not rise high enough to reach above the water (Fig. 54). In time this system will, by continuous growth, lead to the rearing not only of the mountains themselves, but also of the broad fields of what are now sea bottoms — thus repeating the process of growth which has gone on in the older regions of the continent.

The Plains or Lowlands between the Mountain Systems. — What has already been said will make it plain that the growth of this continent, as indeed of all the lands which deserve the name continent, has been brought about by the development of mountain systems, the continents being brought into existence either in the form of sharp ridges or of broad plateaus, which grow upward as the ridges

arise. Our study of the great elevations of land has prepared the way for an account of the greater troughs or valleys of the land and of the rivers which occupy them.

Stretching from the Arctic Ocean to the Gulf of Mexico is one of the greatest valleys in the world (Fig. 55). This great plain owes its existence to the meeting of the inner slopes of the three plateaus. The plain is divided into three immense basins, each with its characteristic stream. Emptying into the Gulf of Mexico is the Mississippi, which drains, by means of the Missouri, Ohio, and a score of other tributaries, almost the whole of that portion of the Great Plain being within the borders of the United States. The northern portion of the Great Plain is occupied in the main by two river basins, those of the Nelson and Saskatchewan, which include almost the whole southern portion of western Canada, or the country drained by the north and the south branches of the Saskatchewan, the Saskatchewan proper, the Red, and the great lakes of Manitoba. The remaining portion of central Canada is largely in the basin of the great Mackenzie River, which flows to the northwest and empties into the Arctic Ocean. Along its course are many large lakes, while its tributaries, the Athabaska, Peace, and Liard, are among the great streams of the continent.

Fig. 55.

Map of North America showing the extent of the Great Plain and its relation to the North American highlands.

Between the Laurentian highlands and the northern part of the Appalachian plateau is situated the valley of the St. Lawrence. The basin of this mighty river is the second in importance on our continent. Like the Nelson and Mackenzie Rivers, the St. Lawrence drains a great number of lakes and is one of the greatest lake-fed rivers in the whole world. The conditions of the

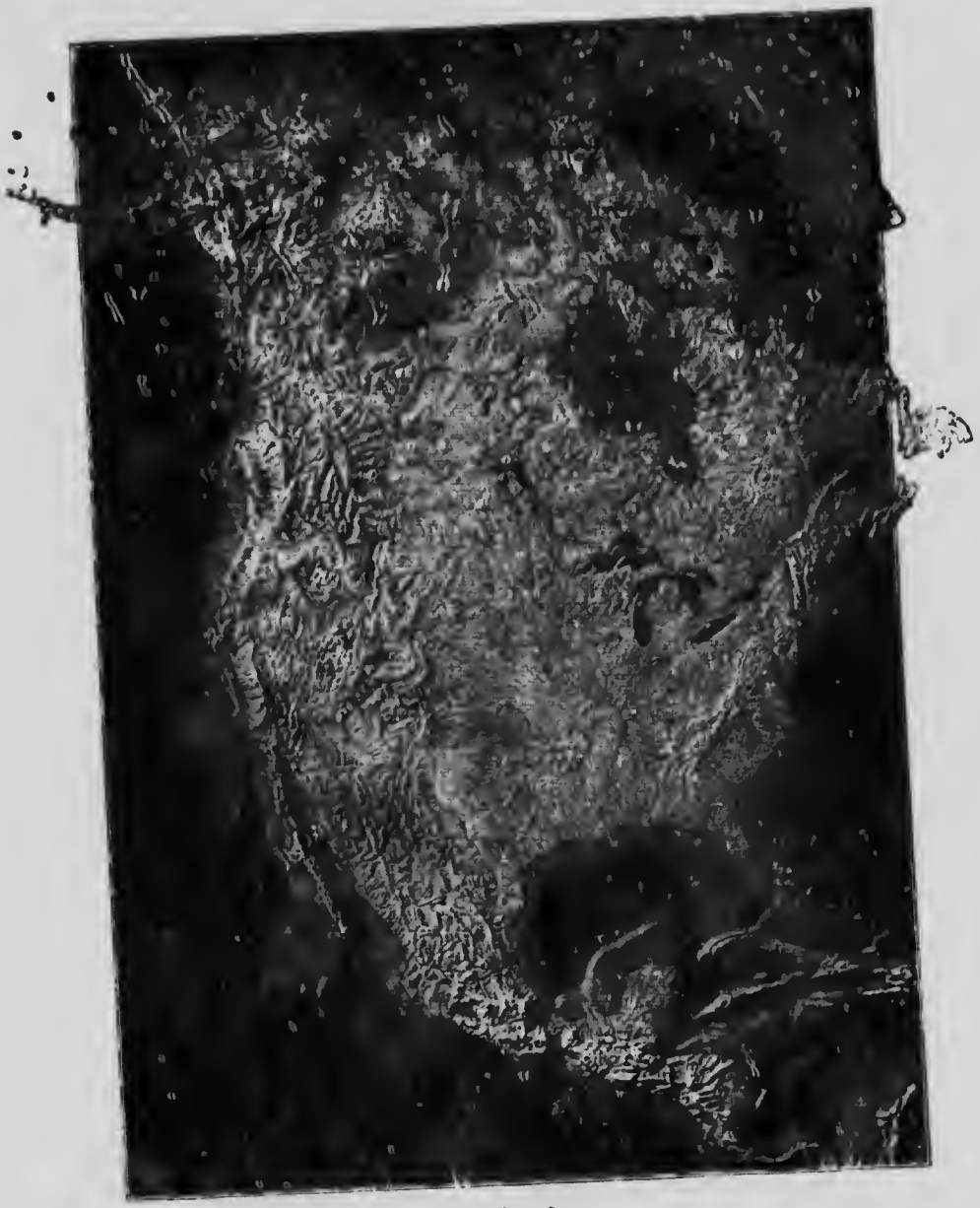


FIG. 50.

Relief map of North America.

(Modelled by E. E. Howell.)

St. Lawrence basin are somewhat peculiar and deserve attention. On the north it is bounded by the Laurentian uplands, while on the south there is no such high wall as we are accustomed to find on either side of a large river valley. Again, the St. Lawrence is also remarkable in the fact that its waters do not descend by a gentle

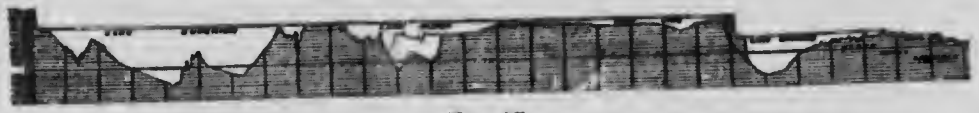


FIG. 57.

Profile of the St. Lawrence and the Great Lakes.

slope to its mouth, but find their way seaward by several great leaps in rapids and falls which are separated by tiny stretches of nearly level water (Fig. 57). It is characteristic of nearly all other great streams that they have to struggle on their way to the sea with a vast load of sediment brought down from the muddy streams by which they are fed. Nearly all such material in the basin of the St. Lawrence is caught by the many lakes of the stream and spread out on the lake bottoms.

The remaining plains are those between the Appalachian and the Atlantic and between the Cordilleras and the Pacific, in both of which are many rivers, but none are deserving, in this general account of our continent, the same description given the four basins already mentioned. On the whole, the rivers of the Pacific plain

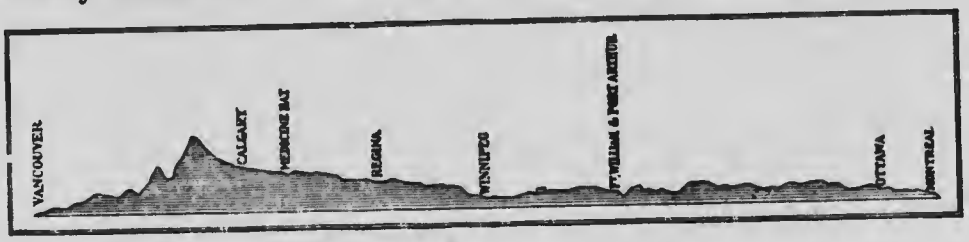


FIG. 58.

A section across North America from Vancouver to Montreal.

or slope are a less conspicuous feature of the country than those on the Atlantic side or those in the heart of the continent. The reason for this appears to be that this western district has been for the greater part of the time since it became firm land a field in which little rain has fallen. As a result, few river valleys have been formed, and those formed are, in consequence of the short distance of their sources from the sea, the limited rainfall, and the impossibility for several great streams to unite into one great river, but

FIG. 59.

A section across the United States.

small compared to the giants occupying the balance of the continent. A careful study of Figures 58 and 59 will help you to understand the relation of the highlands to the lowlands on our continent.

The Great Ice Age. — Long after the coal beds were formed and the great highlands and valleys laid, another very important event happened in the preparation of this continent as the home of men. There came upon the northern portion of our continent a vast coat of ice, which occupied nearly all the present land surface of Canada, a large part of Alaska, and about one-third of the area of the United States. Just before this important change occurred, there was a warm climate as far north perhaps as central Greenland, a land now so cold that only a few plants of the hardiest sort can maintain a scanty growth. When the fields of ice began to move outward from

FIG. 60.

Map showing the extent of the Great Canadian Glacier. *X*, *Y*, and *Z* are supposed to be the centres of three of the glacial sources.

their northern sources (Fig. 60) and from the colder mountain tops to the plains, all the animal and vegetable life which had occupied the northern country was forced to retreat southward or perish from the earth. It is probable that thousands of years were occupied in the migration, for the ice must have pushed its way but slowly in its conquest of the great region it came to possess and to change.

After a period of unknown length this ice sheet disappeared, and with its disappearance, plants and animals came again to possess the fields. As the ice was, when thickest, more than a mile in depth, it must have taken a long time to depart. While it lay upon the northern portion of our continent, it moved slowly from several centres (Fig. 60) toward the sea and the land, and its first effect was

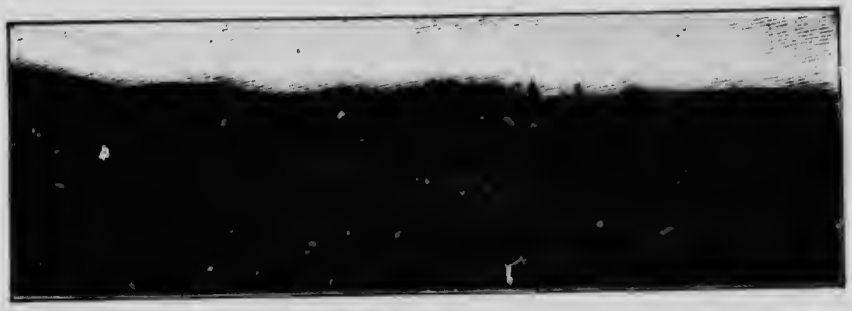


Fig. 61.

Some hummocks in a moraine formed by the Great Glacier, near Ithaca, N.Y.

to sweep away all the soil which had previously covered the country. When this was done, the glaciers—the name given the ice sheet—next attacked the harder underlying rocks, which it either ground into rock flour or used as tools by which to gouge out the ground.

For a long time the ice front stretched across the continent (Fig. 60). This front remained in this position for a long time because the southward movement of the ice was nearly balanced by the waste due to the melting. As the mass of ice was constantly carrying forward great quantities of rock which lay on its surface or was embedded in the ice, and as the water resulting from the melting of the ice formed many streams laden with sediment, a great portion of this rubbish was dumped at the front, and an immense heap of clay, sand, gravel, and boulders was left to show the extent of country actually covered by the ice. In many places this moraine, as it is called, had reached the height of several hundred feet (Fig. 61). When the ice sheet ceased to be well fed by the winter's snow, the southern edge commenced a northern retreat, for here and there in

the great central plain are to be found smaller moraines representing halting-places during the backward movement of the glacier. What would cause this halting? After many years the ice sheet disappeared entirely from the land east of the Cordilleras, but the country covered was more or less buried by a mass of material made and deposited by the glacier, or by the streams to which the glacier gave rise.

It was the glacier which gave rise to the great majority of the lakes of the northern States and of Canada, and the way some of these lakes were formed is as follows: The layer of clay and boulders, or drift, as it is called, was heaped irregularly over the land. These materials sometimes partly filled valleys and built up dams, behind which ponds and lakes collected (Fig. 62). The glaciers also formed lakes by digging or ploughing into the rocks. Even the Great Canadian Lakes did not exist before the glaciers came. Their basins occupy broad river valleys which have been blocked up by tremendous dams or banks of drifts and deepened by the ploughing or gouging of the ice sheet.

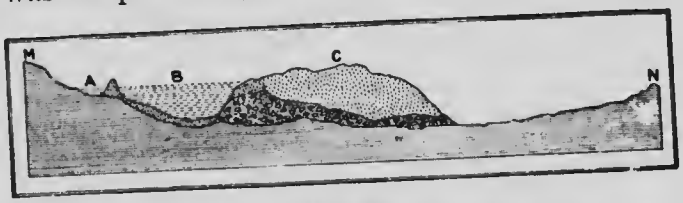


FIG. 62.

A and *B*, lakes formed by the moraine *C*, blocking the valley *MN*.

The glacier had also an important influence upon our manufacturing, for its load of rock fragments often filled the ancient river valleys and forced the new rivers to seek other courses which often lay down steep slopes or across buried ledges on which the water tumbled in a succession of rapids and waterfalls. The many lakes along the river courses act as storehouses to keep the noisy falls and rapids well supplied with the water power we are now using to run our great mills and factories.

A third important influence of the glacier was upon the soil. In most parts of the country the soil had been made by the decay of the rocks, but in the regions covered by the ice this soil was swept away and replaced by drifts brought by the ice. Most of the clays from which bricks and pottery are made in Canada were also brought by the glaciers. With the melting of the ice much water was produced. This worked out or sifted a great deal of the clay, leaving behind in some places extensive sand and gravel plains where the soil is not very fertile. The beds of ground-up rock sometimes left a fertile

soil in places where the decay of the rocks would naturally have caused a sterile soil. On the other hand, in some places, the ice failed to grind the rock finely enough and therefore left pebbles and boulders to cover the ground and annoy the farmer.

The Climate. — All kinds of vegetation require a certain amount of moisture and a certain amount of heat. The sun is the source of heat, and the ocean the source of moisture. Winds are the carriers of both. It is necessary, therefore, that the continent of North America should have its mountain systems so placed as to permit the air laden with moisture and heat to reach the farming lands everywhere. Now, we all know that heat on the whole decreases from the equator to the poles on the land and on the water, but the rate of the decrease is not the same for these two substances. We know that when the earth in the region of Winnipeg, Ottawa, and Montreal is favored with a July sun and summer winds, the Atlantic Ocean at the same distance from the equator is not nearly so warm. We also know that the reverse is true of these regions in the month of January. The reason for this is the fact that water is more slowly heated and more slowly cooled than land. Figure 63 will help you to understand what we have just mentioned.

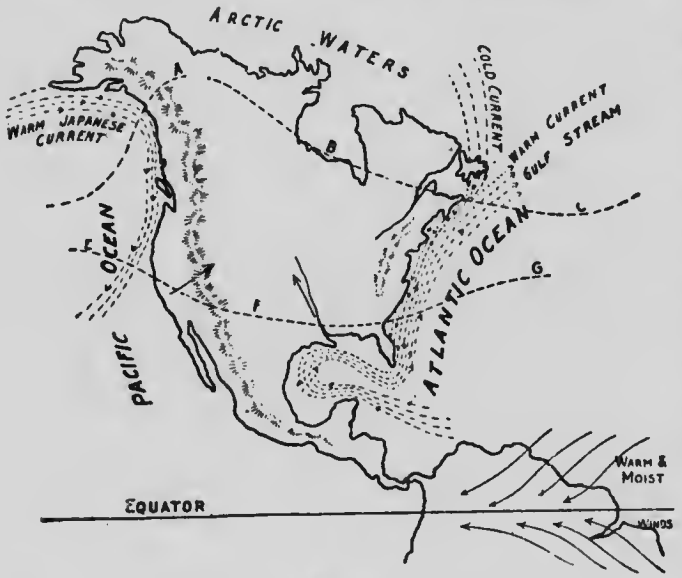


FIG. 63.

Map showing the winds and currents that affect North America. *ABC*, July line of temperature, 60°; *EFG*, January line of temperature, 50°.

As the winds are the carriers of heat and moisture from the ocean, it follows that the location of the great highland regions of a continent may either retard or aid in the distribution of that carried. The plateau of the Rockies, by stretching across the path of the southwest or Pacific winds, causes a large portion of the western part of the Great Plain to assume an arid or semiarid condition.

When a more bountiful rainfall would be a decided advantage to the region, it must not be forgotten that these Pacific winds pass over the plains as warm winds, that have the effect of modifying very materially the winter's climate of Alberta and western Saskatchewan and the country corresponding to the south.

The absence of a mountain chain across the great central plain, the presence of a large body of heated water at the south, and of the cold Hudson Bay at the north permits the moisture-laden winds of the Gulf of Mexico to extend far to the north, a feature of immense value to the grain fields and pastures of the country about the international boundary between Canada and the United States. This arrangement, however, does not prevent the cold winds of the north from sweeping occasionally as far south as the mouth of the Mississippi. The Pacific coast climate may be described by saying that in the north the rains are abundant west of the mountains, but as we go southward, we come to a climate where the summers are almost rainless and where the winters are always mild. The Atlantic coast climate may also be divided into two regions. The northern portion, including the St. Lawrence Valley, is usually a region of abundant summer rains and winter snows. The districts lying south of this and north of the peninsula of Florida, being exposed to the moisture-laden Atlantic winds, is a region of rainy summers and far from rainless winters.

Thus, though our continent lies between two great oceans, it is in its interior regions relatively little affected by this influence. The effect of the Gulf of Mexico is felt upon all the central and eastern parts of the Mississippi Valley and even by and into the region of the Red River of the North and the Great Lakes. Outside in the Atlantic and Pacific are great currents of warm and of cold water, the effect of which may readily be seen by an examination of the positions of these currents on Figure 63.

The Coast Line. — We have already said that the land and sea bottoms are not fixed, but that they often slowly rise or sink. Such changes in the level of the land are even now in progress in many places, though so slowly as to require years and even centuries to notice them. The reason we find so many islands and peninsulas along the northeastern coast is because this region has been lowered so as to allow the sea to enter the valleys while the higher land between extends above the water in the form of capes, peninsulas, and islands. Labrador, Nova Scotia, and the scores of islands along

the northeastern coast owe their existence to the sinking. The indented Pacific coast of Canada was produced in the same way.

By the sinking of the land many good harbors were made, the best being where rivers enter the sea. This is the way the Gulf of St. Lawrence was formed. It is also the way New York, San Francisco, as well as many other fine harbors of the east and west were made. When the land in all the before-mentioned regions was higher, the streams carved out broad valleys into which, when the land sank, the sea entered. One reason for the absence of good harbors along the Gulf of Mexico coast, and the United States coast for many miles north of Florida, is due to the fact that the land in these regions has been rising out of the sea. Just off these coasts is a broad ocean-bottom plain where the water is shallow, while still farther out, the bottom slopes rapidly and the ocean becomes very deep. If this sunken plain, called the continental shelf, should be raised, it would form a great level country like that shown in Figure 64.

FIG. 64.

A part of the raised sea-bottom which forms the level plain of Florida.

Size, Shape, and Position. — North America is third in size among the six continents of the earth. By reference to the tables in the Appendix, find which are larger and which smaller.

After being changed in shape during millions of years, owing to the rising and sinking of the land, it at present has the form of a triangle with the broadest portion in the north. Draw the triangle. Compare its shape with that of South America and Africa. The northern part is so wide that Alaska extends to within fifty miles of Asia; but Labrador is over two thousand miles away from Europe. The distance from Alaska to Asia is so short that the early ancestors of the Indians and Eskimos probably first reached North America by crossing over from Asia. On account of the greater distance across the Atlantic, Europeans for a long time did not know that North America existed; but it is certain that the Norsemen from Norway visited our shores nearly five hundred years before Columbus discovered the continent.

Those portions of North America which are nearest to Asia and Europe are very thinly populated. Farther south, where most of the inhabitants live, the continents are spread farther apart, as you will see by examining a globe. The broad Atlantic must be crossed in passing from Europe to America, and this has helped in the industrial development of the continent. At first, the colonists brought even bricks, doors, and timber from England and France; but although the ocean is an excellent highway, it is expensive to send goods such long distances. Therefore the settlers soon learned to raise and make most of the articles that they needed for food, clothing, and shelter. Nevertheless, the ocean is such an excellent highway, that ships are able to sail across it in every direction, and bring what we really need, or carry back such products as grain, cotton, and tobacco, which Europeans desire.

The Pacific Ocean is much wider than the Atlantic, and therefore much more difficult to cross. Although the shores of Asia which face North America are densely settled, until recently there has been very little commerce with the inhabitants of that continent because they were not very progressive. Now, however, that the Japanese have adopted the methods of modern civilization, and China is being opened up, a large trade has been developed.

South America is also easily reached by water, and there is much trade with the various countries of that continent. Although South America is joined to North America by the narrow Isthmus of Panama, there is at present no railway connecting the two continents, though one is being planned. This isthmus is a great barrier to ocean commerce between eastern and western North America and between eastern Canada and the United States and Asia. It is very narrow, and in places only two or three hundred feet high; yet, because it is there, ships must travel thousands of miles around South America. A railway crosses it, and a ship canal is now being constructed under the direction of the government of the United States. Of what advantage will this canal be?

Summary. — We see, therefore, that our continent, as we now know it, has not been here from the beginning; instead of that, thousands upon thousands of years have been required to prepare it for us. Ocean bottoms have been lifted into mountains, plateaus, and valleys; coal beds, building stones, and valuable minerals have been formed; a mighty glacier has swept over the country, grinding rock into powder and causing lakes, water-routes, falls, and rapids; the coast has been sinking here and rising there, producing fine harbors in some places and greatly increasing the boundaries of the

plains in others; and finally, the greater portion of the continent has been planned so well with relation to the heat of the sun and the ocean moisture as to permit of a vast farming country to be worked successfully.

REVIEW QUESTIONS. — (1) Why should we know our own continent? (2) What was the condition of North America in early times? (3) Name and locate our great highland regions. (4) Describe each of them. (5) What is coal made from? Tell how it was formed. (6) What proofs are there of this formation? (7) What is peat? (8) In what order were the mountains built up? (9) Why are there so many mines found in mountainous regions? (10) Mention in what ways the mountains control the great valleys of the Mississippi, Nelson, Saskatchewan, and Mackenzie. (11) What differences would follow if the mountain ranges extended east and west? (12) Describe the coming of the Great Glacier. (13) Tell about its withdrawal. (14) How far did the Great Glacier extend southward? (15) How were moraines made? (16) In what directions did the ice move? How do you know? (17) How did the Glacier assist in the formation of lakes? (18) Tell how the ice helped to make and to distribute the soil. (19) Of what use are falls and rapids? (20) How were these made? (21) Why are there so many harbors along the northeastern coast of America, and so few along the Gulf of Mexico coast? (22) Name some of these harbors. (23) How does North America compare in size with the other continents? (24) How far is the mainland from Asia? From Europe? (25) Make a map of North America showing as many of the physical features mentioned in the chapter as you can.

SUGGESTIONS. — (1) Make a collection of different kinds of coal. (2) Examine some pieces of soft coal closely to see if you can discover plant remains. (3) Observe some peat. (4) Learn what you can about coal mining. (5) Examine layers of rock in your neighborhood to see if they are horizontal or tilted. See if they contain fossils. (6) Make a map showing the extent of the Great Glacier. (7) What signs of the Glacier, if any, can you find in your neighborhood? (8) Name several cities that have grown up around the harbors of North America. (9) Draw an outline map of the northeastern coast and another of the southern coast, to see how they differ. (10) How many days long is the voyage, on a fast steamer, from Montreal to Liverpool? (11) How long is the journey from Vancouver to Yokohama? From San Francisco to Manila?

II. PLANTS, ANIMALS, AND PEOPLES

THE climate of a region is one of the most important facts concerning it ; for where temperature and rainfall are favorable, plants usually grow luxuriantly. And since plants furnish animals with food, where vegetation is luxuriant, animal life may be abundant.

Since North America extends far north and south, and possesses lofty mountain ranges and enclosed plateaus, it has a great varicty of climate, and, therefore, a great variety of plant and animal life.

FIG. 65.
Arctic poppies growing on the edge of a snowbank.

Plants of the North. — The northern part of the continent is bitterly cold. In that region there is a vast area where the soil is always frozen, except at the very surface, which thaws out for a few weeks in summer. On account of the frost, trees such as we are familiar with cannot grow. Their roots are unable to penetrate the frozen subsoil and to find the necessary plant food. There are some willows, birches, and a few other plants with woody tissue, bark, leaves, and fruit ; but instead of towering scores of feet into the air, they creep along the surface like vines, and rise but an inch or two above ground. Only by thus hugging the earth can they escape the fierce blasts of winter and find protection beneath the snow.

A few grasses and small flowering plants grow rapidly, produce flowers, even close by the edge of snowbanks (Fig. 65), and then pass away, all within the few short weeks of summer. Some of these plants produce berries, which after ripening are preserved by the snows ; thus, when the birds arrive in the spring, they find food ready for them.

Animals of the North. — The summer development of insects is rapid, like the growth of plants. As the snow melts and the surface thaws, the ground becomes wet and swampy, and countless millions of insects appear. Among them the most common is, apparently, the mosquito. There are few parts of the world where this creature is a worse pest than on the *barren lands* of North America and the *tundras* of Europe and Asia, as these treeless, frozen lands are called.

Fig. 66.
Walrus on the Arctic floe ice.

Few large land animals are able to thrive in so cold a climate and where there is such an absence of plant food. The reindeer, or caribou, the musk-ox, polar bear, white fox, and Arctic hare are the largest four-footed land animals (Fig. 67); and the crow, sparrow, and ptarmigan are the most common land birds.

The ptarmigan changes its plumage to white in winter, and other animals of the Arctic, such as the fox, polar bear, baby seal, and hare, are also white. This serves to conceal them, in that land of snow and ice, so that they may hide from their enemies, or steal upon their prey unawares.

The tiny white fox feeds upon birds and other animal food; but the other land animals, except the polar bear, live upon plants, such as berries, grass, and moss. The caribou finds a kind of plant, called "reindeer moss," which grows upon rocks that rise above the deep winter snows. If it were not for this, the reindeer would not be able to live through the long winter. Often, also, he paws through the snow to find this moss.

While some animals live upon the land in the Arctic regions, many more have their homes in the sea, because there, except at the very surface, the temperature never descends below the freezing point. Therefore there is plenty of animal life of all sizes, from the very tiniest forms to the whale, the largest animal in the world. During the winter the surface of the sea freezes over; and then

FIG. 67.

Some of the animals of the North. The great auk had such small wings that it could not fly. It was killed in great numbers by sailors, and has been completely exterminated.

many of the sea animals migrate southward. Even the huge walrus (Fig. 66) moves clumsily toward a more favorable climate. The birds go farthest, especially the geese, ducks, and gulls, which fly to a more southern climate, to spend the winter where their food is not covered by ice.

Sea birds exist by hundreds of thousands (Fig. 67), building their nests upon rocky cliffs in immense numbers. Indeed, they are so numerous that, when suddenly frightened, as by the firing of a gun, they rise in a dense cloud that obscures the sun. Then, with their cries they produce a din that is almost deafening. In the water, seals and walruses live, the former being so valuable for their oil and skins that men go on long voyages to obtain them. The oil comes from a layer of fat, or "blubber," just beneath the skin, that serves to keep out the cold.

The seal is the most common of the Arctic sea animals, and is the principal food of the Eskimo and the polar bear. The bear, protected from observation by his white color, stealthily creeps upon his prey, asleep upon the ice; or he patiently watches until his victim swims within reach, and then seizes him with his powerful claws.

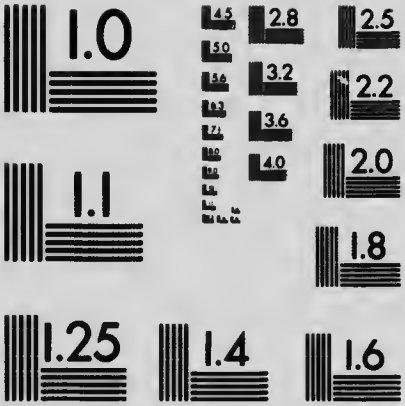
Plants and Animals in Western United States and Northern Mexico. — A large area in western United States and Mexico has a very slight rainfall, although its temperature is agreeable. In some places, as near the Pacific coast and upon the mountain tops and high plateaus, there is rain enough for forests to thrive; but in most portions of this region the climate is so dry that there are no trees whatsoever. Indeed, some parts are desolate in the extreme and almost devoid of life, both plant and animal; in other words, they are true deserts.

One common plant is the bunch grass, so called because it grows in little tufts or bunches. The sage bush, a plant with a pale green leaf, named because of its sagelike odor, is found throughout most of this arid region. Other common plants are the mesquite, the century plant with its sharp-pointed leaves, and the cactus with its numerous thorns. In favorable spots, especially in the warm Southwest, the mesquite grows to large size; and the cactus, which in the North is always low and represented by only a few kinds, in the Southwest, as in Arizona, grows in great variety and, in some cases, even to the height of trees.

On account of the extreme dryness of the climate, these plants have a severe struggle for existence, and adopt peculiar means for protecting themselves. For example, the cactus, unlike other plants, has no leaves. It thus exposes little surface to the air for evaporation. In its great, fleshy stem it stores water to use through the long, dry seasons, while

FIG. 68.

Some of the animals of the plateaus and mountains of the western United States. A number of these animals are found in British Columbia.



spines protect it from animals in search of food. The mesquite also protects itself by spines, and in addition has such large roots that the part of the plant under ground is greater than that above. The roots of this plant are an important source of wood for fuel. Some of these plants, as mesquite, are so bitter that they are not eaten by animals.

Fig. 69.
Giant cactus in the desert of southwestern Arizona.

Animals eat few of the arid land plants except the grasses, which were once the food of the buffalo, or bison (Fig. 72), and are now the support of cattle and sheep. The cowardly prairie wolf, or *coyote*, and the graceful antelope and the rabbits upon which it feeds, are the most abundant (Fig. 68). Among the rabbits is the long-legged jack rabbit, which leaps across the plains with astonishing speed, with its huge ears thrown back so far that they do not retard its progress.

The fierce puma, or mountain lion, still lives among the mountains, and also the ugly cinnamon and grizzly bears (Fig. 68), though the latter are now rare and difficult to find. Deer and elk inhabit the forest-covered mountains; and among the higher peaks a few mountain goats and sheep still live on the more inaccessible rocky crags (Fig. 68). The sheep have huge horns much prized by hunters.

Plants and Animals of the Tropical Zone. — Contrast the life in the frozen North with that in Central America and southern Mexico. In these regions, which are situated in the torrid zone, the temperature is always warm; and the rainfall, especially on the eastern coast, is so heavy that all the conditions are favorable for dense vegetation.

Indeed, the tangle of growth in the forests is often so great that it is practically impossible to pass through without hewing one's way. Besides trees and underbrush, there are quantities of ferns, vines, and flowers, many of which hang from the trees with their roots in the air instead of in the ground. They are able to live in this way on account of the damp air. Among the trees are the valuable rosewood, mahogany, ebony, and

FIG. 70.

A few of the animals of the tropical forests.

rubber tree; and among the flowers are the beautiful orchids. On account of the continual warmth and moisture, many plants, like the banana for instance, bear fruit throughout the year.

In the midst of such luxuriant vegetation, animal life is wonderfully varied and abundant. There are the tapir, monkey, and jaguar (Fig. 70); brilliantly colored birds, such as parrots, paroquets, and humming birds; and millions of insects. Scorpions and centipedes abound, and ants exist in countless numbers, some in the ground, others in decayed vegetation. Serpents, some of them poisonous, are common in the forests; and in the rivers are fish and alligators, the latter being found as far north as Florida and Louisiana.

Plants, Animals, and Birds in the Temperate Part of North America. — Between the frigid and torrid zones, and both east and west of the arid region, is an area of *moderate* rainfall and temperature where the vegetation and animals differ from those of the other sections. Beginning in the warm South and passing northward, we find that both animals and plants grow less numerous and less varied until, near the arctic zone, they become scarce and few in kind. The pines and oaks give place to the spruce, balsam fir, and maple; then these gradually become stunted and disappear, and beyond this the barrens are reached.

The wild animal life in the temperate portion of Canada is very varied. The moose and the woodland caribou may be found in the wooded regions all over Canada, while the Virginia deer is common in the forests of Ontario, Quebec, and New Brunswick. The mule-deer, the prong-horned antelope, and the American elk, or wapiti, make their home west of the Great Lakes. The mountain lion and the wolverine are common in British Columbia. The wild cat and lynx roam the forests everywhere. Bears, wolves, and foxes of various species may be found in all parts of Canada. The smaller animals, such as the marten, weasel, ermine, mink, otter, muskrat, rabbit, squirrel, etc., abound; while the beaver is still found, although in diminished numbers. In British Columbia the Rocky Mountain goat and the big-horn sheep, although constantly hunted, are steadily increasing. The greater number of these animals are protected by provincial laws, which prohibit shooting except at certain seasons, and then only in small numbers. In northern United States, with few exceptions, the animals are the same as in Canada.

Fig. 71.

Other animals of Canada and the United States. With the exception of the musk ox, all of these animals are found in the temperate parts.

The bird life of Canada is quite as abundant as the animal life, there being over six hundred varieties of birds found in the country. Wild fowl abound everywhere. This is due largely to the fact that more than one-half of the fresh water of the world is in the Dominion of Canada, and here the wild fowl gather to build their nests and rear their young. The coasts also swarm with waterfowl of all kinds.

Formerly the prairies of the Great Central Plain were the grazing place for immense herds of buffalo, or bison. The bison, however, were slaughtered, — thousands upon thousands, — for their hides and tongues alone, and their bones left to whiten upon the plains. The result is that the bison is almost extinct, only a few herds, such as those at Banff and at Winnipeg (Fig. 72) and in the Yellowstone National Park, being still preserved.

FIG. 72.
Buffalo from the herd at Winnipeg.

A slow change has been in progress in this temperate section, which, when first discovered, was clothed in forests and luxuriant prairie grass, and inhabited by Indians and wild beasts. The white man has come into possession of the land and has cleared the forests and ploughed the prairies, so that, where trees stood and Indians hunted the bison and other game, there are now fertile farms and thriving cities.

Our crops and domesticated animals well illustrate how man has learned to make use of nature for his needs. Every one of our cultivated plants was once a wild plant; and each of our domesticated animals has been tamed from the wild state. Most of these have come from Europe and Asia; but America has added some to the list. Among plants in common use, the Indian corn, or maize, the tobacco, tomato, pumpkin, and potato were unknown to the Old World until America was discovered. The same is true of the turkey; and perhaps, in a hundred years or so, the bison may be included among the domesticated animals, for on some of the cattle ranches of the West a few small herds are being carefully reared.

Peoples

Eskimos. — America was inhabited for thousands of years before it was discovered by white men. To the natives in the southern part Columbus gave the name *Indians*, supposing he had reached India. Those in the Far North, who subsist on meat, are called Eskimos, a word meaning flesh-eaters.

To-day, in some places, the Eskimos (Fig. 73) live in very nearly the same condition as formerly, their climate being so severe that white men have not settled among them nor interfered with their customs. They still roam about in summer, living in skin tents, or *tupics*, and in the winter erecting snow and ice huts, or *igloos*. Their struggle is a hard one, for they not only have to battle against cold, but also to obtain their food amid great difficulties. In this they are aided by their dogs, doubtless domesticated wolves, which, like their masters, are able to subsist upon a meat diet and withstand the severe Arctic cold. Every Eskimo man has his team of dogs to draw his sledge over the frozen sea.

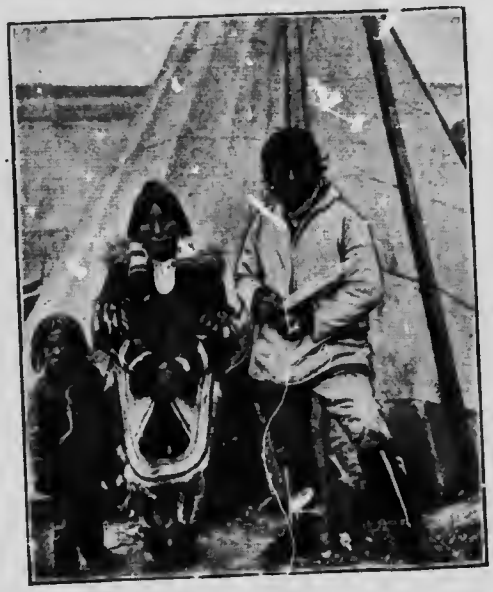


Fig. 73.
An Eskimo family.

Indians. — Indians were originally scattered over most of the country south of the Arctic Circle. This is indicated by the places that bear Indian names, as Canada, Toronto, Winnipeg, Ottawa, Erie, Huron, Illinois, Dakota, Pueblo, and Sioux City. Some of the tribes were true *savages;* others, not so savage, may be classed as *barbarians*. They raised "Indian corn" and tobacco, baked pottery, used tools and weapons made of stone, and lived in villages.

In Mexico and Central America the aborigines were more civilized. Much of that region is arid; but the Indians raised crops by irrigation, and built fortresses of stone and sun-dried brick (Fig. 74). These were erected partly as homes for protection from surrounding savages, and partly as storehouses for grain.

The most noted among these Indians were the *Aztecs*, who occupied the city of Mexico and some of the neighboring country. They had government and religion much better developed than the barbarous and savage tribes. They mined gold and silver, and manufactured the metals into various articles; they wove blankets, and ornamented their pottery and their buildings in an artistic manner. Living the quiet life of the farmer, the Aztecs preferred peace to war, and a settled home to the nomadic life of the hunter.

FIG. 74.

The pueblo of Taos in New Mexico. Notice the ladders leading to the roofs upon which are the house entrances.

While some tribes thus approached a state of civilization, the Indians, as a race, never became a powerful people. For this there are several reasons. Instead of forming one great confederacy and living at peace with one another, they were divided into many tribes. Each tribe had a certain area over which it could roam and hunt; but if it encroached upon its neighbors, war followed. Under these circumstances it was difficult for one tribe to advance to a much higher state of civilization than the others.

The level nature of the country rendered this difficulty all the greater. Had the surface of North America been very mountainous, some tribes might have been so protected by surrounding mountain walls as to dare to devote themselves to other work than war. Then they might gradually have collected wealth and developed important industries; but the vast Great Central plain, and the extensive plains and low mountains of the eastern part of the continent, allowed little protection. If any one tribe had built good homes on these plains and collected treasures within them, the neighboring Indians would have felt that a special invitation had been extended to attack them. The Aztecs were continually in danger from

this cause. However, the fact that they were *partly* protected by mountains and deserts, was one of the reasons why they were more civilized than the Indians of the northeast.

Another serious obstacle to the advancement of the Indians was the fact that they possessed no domestic animals for use in agriculture. The horse, cow, ass, sheep, goat, and hog were unknown to them; and without these farm work becomes the worst of drudgery, because every product must be raised by hand.

Again, although there was much game, the supply was never sufficient to support a dense population for a long period. Even the scattered Indian population was obliged to wander about in search of it. This prevented them from living quietly and finding time for improvement. All these facts worked against the advancement of the Indians; but they proved of great advantage to the whites, making it far [illegible] than it would otherwise have be[illegible]em to obtain possession of A[illegible]

Fig. 75.
Indian woman carrying her baby, or *papoose*.

There are [illegible] the present time in Canada about one hundred thousand Indians, scattered from the Atlantic to the Pacific. Some of the tribes are nomadic, but the greater number of the Indians have made treaties with the Dominion government and are settled in reservations set aside for their use. The Indians have always in Canada been very kindly treated by the government, so there has been very little trouble in dealing with them.

The Spaniards. — The astonishment of Europe was great when it was proved that there were vast territories on this side of the Atlantic. America was pictured as containing all sorts of treasures, and European nations vied with one another in fitting out expeditions to take possession of them.

The Spaniards naturally led, for they were then one of the most powerful nations of Europe, and had sent out Columbus as their representative. Leaving Palos in Spain on his first voyage, he was carried southwestward by the winds to one of the West Indies, a point much farther south than Spain itself.

The section reached by the Spaniards had a climate similar to that of their own country, and they easily made themselves at home there, and soon came into possession of most of South America,

Central America, Mexico, and southwestern United States. They had one advantage over the English and French, who settled farther north: the portion of the continent that they discovered is so narrow that they easily crossed it, and thus enjoyed the privilege of exploring the Pacific coast also. It was because of this fact that the Spanish race settled the western coast as far north as San Francisco.

The French. — The French began their settlements in a very different quarter, being first attracted to America by the excellent fishing on the Newfoundland banks. Soon the fur trade with the Indians proved profitable, and the French took possession of Nova Scotia and the region along the St. Lawrence River and the Great Lakes. Port Royal, Quebec, and Montreal were founded, and forts built to protect the settlers from the Indians and the English.

The value of the fur trade, and a desire to convert the Indians to Christianity, led the French far into the interior of the continent, both to the west and northward. Making their way southward to the mouth of that river, they took possession of the whole Mississippi Valley, and called it Louisiana, in honor of their great king, Louis XIV. In order to hold this vast territory, they established a chain of trading posts and forts from the Gulf of Mexico to the Gulf of St. Lawrence. Other explorers made their way north as far as Hudson Bay, and laid claim to that territory in the name of their king.

The English. — The Spanish and French left only a narrow strip along the Atlantic coast for other nations. Among those who attempted settlements were the Dutch in New York and the Swedes in Delaware. But the English, settling at various points along the coast, soon obtained the lead. They captured New York City (then called New Amsterdam) from the Dutch, and extended their settlements along most of the coast from Florida to Nova Scotia. In addition, they laid

FIG. 76.

Map showing the claims of France, England, and Spain upon the territory of central North America in 1760.

FIG. 77.

MAP QUESTIONS.—(1) What oceans touch the coast of North America? (2) Locate the highlands and watersheds of the continent. Point out the largest rivers. Locate on an outline map the highlands and rivers. (3) Compare the area of the large river basins. (4) Compare the eastern with the western highlands. (5) Trace the boundaries of the central plain and estimate its extent. (6) Locate the great lakes of the continent. Compare the area of the lakes in Canada with the area of those in the United States. (7) Name and locate each of the large peninsulas, islands, gulfs, bays, and seas. (8) Compare the eastern with the western coast of North America. (9) Locate and give the boundaries of each of the political divisions. (10) Name and locate the largest cities. Compare the advantages in the situation of each.

claim to and explored the northern interior of the continent, moving inland from the fur-trading posts on Hudson Bay.

In several respects the portion that fell to the English seemed much less desirable than that held by the Spanish and French (Fig. 76); yet the English-speaking race has managed, not only to retain this, but to add to it most of the possessions of the other two. At the present time, the control of the entire continent, with the exception of Mexico, Central America, and a few small islands, is in the hands of the English-speaking race.

By the treaty of Paris in 1763 the whole of Canada owned by the French was handed over to Great Britain. Soon after, the Thirteen Colonies rebelled against the mother country and, after obtaining their freedom, formed the United States of America. In 1803 the United States purchased from the French Louisiana, which included a large part of the Mississippi Valley. In 1821 Mexico secured her independence, but in 1848 was compelled to cede a portion of her territory to the United States. In 1867 the Dominion of Canada was formed, and shortly after enlarged by the addition of the Hudson Bay Territories, British Columbia, and Prince Edward Island. In the same year, 1867, the United States purchased Alaska from the Russians for the sum of $7,200,000.

Negroes.—While the Indians of the East were being killed in war and driven westward, negroes were being brought from Africa. There are now fully eight million blacks in the United States, which is about one-tenth of its entire population, and thirty times the number of Indians. Before and during the American Civil War quite a number of negroes took refuge in Canada, settling for the most part near the border in Ontario.

Slavery was first introduced into America by the Spaniards, who made slaves of the Indians, and afterward imported negroes from Africa. The first negro slaves in the British colonies were brought to Virginia in 1619, but their number increased very slowly until the close of that century. The demand for cheap labor was partly supplied by criminals sent over from England, and by other immigrants who gave their services for a few years in payment for their passage across the sea. Many of these were men and women of good character, who became excellent citizens.

Negro slaves were brought to all the colonies, but they soon proved a much more profitable investment in the South than in the North. In the New England states the farms were small, the products were numerous, and their cultivation required considerable skill. Moreover, the climate was severe for natives of tropical Africa. On the other hand, the Southern climate was well suited to them; and the simple routine work

upon the great tobacco, cotton, sugar, and rice plantations was such as they could easily perform. Accordingly, the number of negroes increased in the South, while slavery gradually disappeared from the North.

Immigrants to America. — Both Europe and Asia have poured forth a stream of immigrants into America, more especially into the United States, but latterly into Canada as well. The increase in population of the United States from a little over three millions in 1785 to nearly eighty millions at present is due largely to this steady stream from abroad. Nearly every foreign language is represented, and upon the streets of the larger cities in Canada and the United States may be heard the languages of most of the civilized peoples of the world. The greater number of the immigrants into America have come from the British Isles and from the nations of northern Europe. More recently there has been a large influx of settlers from southern Europe. In Canada these peoples have for the most part settled in Manitoba, Saskatchewan, and Alberta.

Review Questions. — (1) Of what importance is climate? (2) Why are there no large trees in the cold North? (3) Describe the vegetation there. (4) Tell about the animals that live on the land. (5) Why are there more animals in the sea? (6) What kinds live there? (7) How do arid land plants protect themselves? (8) Tell what you can about the animals living in the arid lands. (9) Why should there be more life in the tropical zone? (10) Name some of the animals living there. (11) What can you say of the plants of the moist temperate zone? (12) Of the animals? (13) Of the bison? (14) What cultivated plants and domesticated animals has North America supplied?

(15) Describe the difficulties that the Eskimos encounter. (16) Give some examples of Indian names. (17) Describe the life of the different kinds of Indians. (18) What causes prevented the Indians from becoming more civilized? (19) Give a reason why the Aztecs were able to advance. (20) What advantage did their location in southern North America give the Spaniards? (21) How did the Spaniards treat the Indians? (22) What attracted the French to America? Where did they settle? (23) What other nations settled in the East? (24) What has been the fate of the Spaniards in America? (25) Why have the English-speaking people come into possession of the greater part of the continent? (26) Tell about the beginnings of slavery in America; why was it more successful in the South than in the North? (27) Where do our immigrants come from?

Suggestions. — (1) Examine some century and cactus plants. (2) Find some furniture made of mahogany or other tropical wood. (3) Visit a greenhouse to see orchids. (4) Collect pictures of native plants, animals, and birds of North America. (5) Collect samples of different American woods. (6) What have you read about the bison? About Indians? Write a story about each. (7) Do you know any of the negro melodies that were sung on the plantations?

III. THE DOMINION OF CANADA

The Countries of North America.—The continent of North America is under the control of various nations. The Dominion of Canada is a colony of Great Britain, as are also Newfoundland, Labrador, British Honduras, and a number of the islands of the West Indies. Greenland is a Danish colony. The United States, Mexico, and the six Central American Republics — Costa Rica, Nicaragua, Honduras, Guatemala, San Salvador, and Panama — are independent nations. Alaska belongs to the United States, as do Porto Rico and the Hawaiian Islands. The islands of the West Indies, not controlled by Great Britain and by the United States, are either independent or are owned by one or other of the European powers.

The Provinces of Canada.—The Dominion of Canada was formed in 1867 by the union of the four provinces of Ontario, Quebec, New Brunswick, and Nova Scotia. Soon after, the Hudson Bay Territory was acquired by the Dominion, and from this was carved, in 1870, the province of Manitoba, and in 1905 the provinces of Alberta and Saskatchewan. In 1871 British Columbia joined the confederation, and in 1873 Prince Edward Island threw in her lot with the Dominion. There are now in Canada nine provinces, one organized district, Yukon, and the unorganized North-West Territories. Locate each of these provinces and districts on the map of Canada (Fig. 78).

Although Canada stretches from the Atlantic Ocean to the Pacific, yet the provinces are closely connected with one another by means of one or more lines of railway. When the Dominion was formed in 1867, it was agreed that a railway should be constructed between the maritime and the upper provinces. This was undertaken at once, and the Intercolonial Railway, owned by the Dominion Government, now connects Halifax and Montreal. Similarly, it was agreed with British Columbia, in 1871, that a line of railway should be built to connect that province with Ontario and Quebec. The Canadian Pacific Railway, completed in 1885, now joins Vancouver and Montreal, and in addition a short line of the same railway, running for a portion of the distance through the United States, connects Montreal and St. John. Both the Canadian Pacific and the Grand Trunk Railways have many branches throughout Ontario and Quebec. The

Canadian Northern Railway, in addition to branches in Ontario and Quebec, extends from Port Arthur to points in western Alberta, and will ultimately push its way through to the Pacific coast. A new line, the Grand Trunk Pacific, is now in course of construction, and will, when completed, extend from Moncton, New Brunswick, to Prince Rupert, British Columbia. A portion of this line is being built by the Dominion Government. A line of steamers, owned and operated by the Dominion Government, plies between Prince Edward Island and the mainland. Trace these lines of railway on the map (Figs. 78 and 167).

Government of Canada. — The Dominion of Canada is so large and so different in the various parts that in order to study it in detail we must divide it into sections. The provincial and district boundaries will serve as a means of thus dividing the country, and these divisions will be taken up in order, beginning with the province of Ontario. But, as the Dominion of Canada is a federation, there is one matter that concerns all the provinces that cannot be treated under any one section, and must be taken up at this point. This is the question of government.

Canada, being a colony of Great Britain, owes allegiance to Edward VII, King of Great Britain and Ireland and of the British Dominions beyond the Seas. But in all matters of importance, particularly taxation and expenditure, Canada is self-governing, and only in questions that concern the interests of the British Empire as a whole does the home government claim any control over the Dominion. The sovereign is represented in Canada by the *Governor-General*, who is appointed by and holds office during the pleasure of the Imperial Government.

While each province has complete control over its own local affairs, it has representation in the *Senate* and the *House of Commons*, the two bodies that make up the *Parliament* of Canada. The members of the Senate are appointed for life by the Governor-General. Each Senator must possess property to the value of $4000, and must reside in the province he represents. The members of the House of Commons are elected by the people, each province being divided into electoral divisions for the purpose. The representation of Quebec is fixed at 65, and each of the other provinces is represented in the same ratio to their population as 65 bears to the population of Quebec. An election for members of the House of Commons must be held at least every five years, although Parliament may be dissolved at any time. All laws before going into force must be passed by both the House of Commons and the Senate, and must receive the assent of the Governor-General.

The business of Parliament, and practically the government of the country, is in the hands of the *Cabinet*, or *Executive Council*, of which the head is the *Prime Minister*, or *Premier*. The members of the Cabinet may be chosen

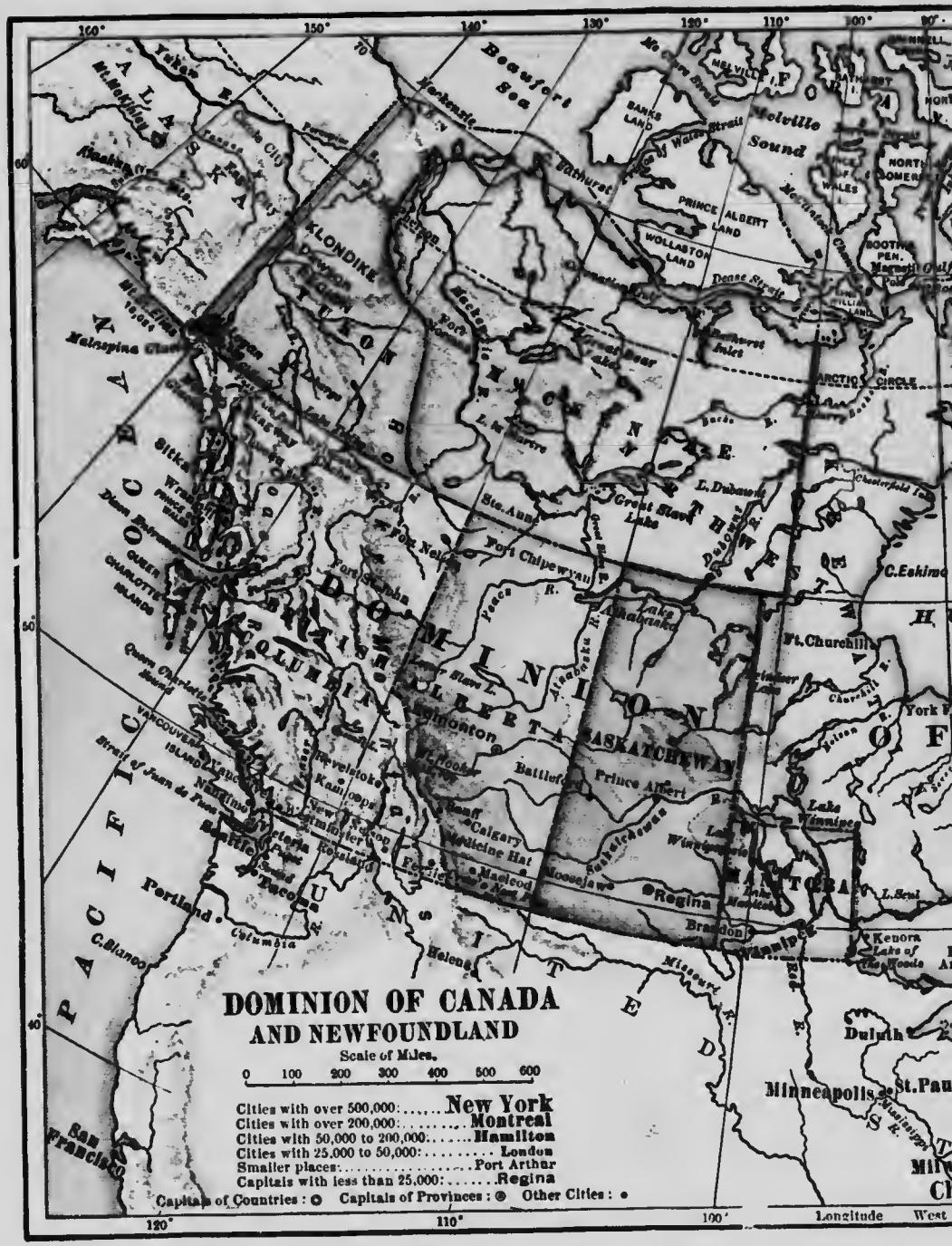


FIG.

MAP QUESTIONS.—(1) Trace in detail the boundaries of Canada. (2) Locate the highlands and watersheds of the country. Trace the boundaries of the principal river basins. Compare the length of the rivers in each basin. (3) Draw an outline map of Canada, showing the prominent physical features and locating the principal rivers. (4) Trace the course of the River St. Lawrence from Lake Superior to the Gulf of St.

FIG. 78.

Lawrence. (5) Point out the large lakes of the country. Compare their areas. (6) Locate the capes, bays, and islands along the coast. (7) Compare the eastern with the western coast. (8) Locate the most important lumbering, mining, and agricultural districts. (9) Trace the boundaries of each of the Provinces. Compare their areas. Point out the capital of each. (10) Name and locate the large cities in Canada.

either from the House of Commons or the Senate, and represent the political party that at the time happens to have a majority in the House of Commons. Each Cabinet minister usually presides over one of the departments of the public service, such as Railways, Public Works, Militia, Post Office, Customs, etc. Generally the Cabinet includes some members who do not have charge of a department, and are called *Ministers without portfolio.*

The seat of the federal government of Canada is at Ottawa, where are the stately Houses of Parliament (Fig. 79), the Departmental Buildings, and the residence of the Governor-General.

FIG. 79.
The Parliament Buildings, Ottawa.

I. ONTARIO

Physiography and Climate.[1] — As might be expected, the province of Ontario, stretching as it does from James Bay to Lake Erie, exhibits a wide variety of soil and climate. In past ages, as is shown by the fossils embedded in soil and rock, the extreme eastern part of the province was covered by the waters of the ocean, while a portion of the southern part was once the bed of a great fresh-water lake. The whole northern and central part was covered by great glaciers, which eroded thousands of basins that are now the beds of fresh-water lakes. These numberless inland lakes vary in size from a few acres to several square miles, and are usually very deep. When the glacier retreated the land was left covered with glacial drift, and in some places with great boulders. Locate on the map the principal lakes of the province. Note particularly the Muskoka district.

Generally speaking, the southern and eastern parts of the province are fertile, while the northern and western parts are rocky and often barren.

[1] A complete description of the St. Lawrence River system is given in *Appendix A.*

The southern peninsula formed by Lakes Huron, St. Clair, Erie, and Ontario is so fertile that it is sometimes called the "garden of Canada." It is possible to find here whole townships having scarcely a single acre of waste land. A broad strip of fertile land stretches along the north shore of Lake Ontario and the St. Lawrence. North some distance from Lake Ontario, extending from the county of Frontenac to Lake Simcoe, there is a rocky country. The greater part of the Ottawa valley is extremely fertile, but in some parts the boulders of the glacial drift are numerous. There is much good soil around Georgian Bay and Lake Simcoe. North of a line stretching from Georgian Bay to the Upper Ottawa the fertile soil is in patches. This northern part of the province — now called New Ontario — was long thought to be of little value except for its lumber and minerals or for hunting and fishing. Much of it has recently been surveyed, and we now know that there is enough fertile land to support at least a million people.

Several fertile areas are now being rapidly settled around Lake Temiscaming and in the Rainy River district. Recent experiments show that some grains and many vegetables will mature even north of the Height of Land, and as this region has large fertile areas, many people will yet find homes there.

The rainfall of Ontario is abundant and for the most part evenly distributed. Extended droughts sometimes occur in southern Ontario during July and August, but their area is limited. It is expected that the reforesting of parts of the drought area will give a more even distribution of rainfall.

The winter climate, especially of northern and eastern Ontario, is somewhat severe, but the snowfall is abundant and furnishes an adequate protection to plant life. In southern Ontario the winters are usually mild. The counties along Lake Erie frequently have open weather even in January and seldom have more than six or eight inches of snow.

Agriculture

Grain-growing. — From early in the nineteenth century until the close of the third quarter the principal crop of Ontario for export was wheat. But the opening of vast areas in western Canada, the United States, and South America so reduced the price of wheat, and conditions otherwise have so changed that the farmers have turned to stock-raising and dairying, very much to their own advantage. To-day many farmers who formerly grew hundreds of bushels of wheat are buying their own flour. Still grain-growing forms one of

FIG. 80

MAP QUESTIONS.—(1) Point out and name the lakes and rivers that form the boundaries of Ontario. (2) Compare the areas of the Great lakes. Show how these Lakes are connected. Compare their shore lines. (3) Name and locate the principal islands in the Great Lakes. (4) Trace the more important canals. (5) Point out the prominent physical features. Compare the northern with the southern section of the Prov-

FIG. 80.

ince. Name and locate the larger rivers. (6) Name and locate the principal lakes in the interior. Compare their areas. (7) Trace the lines of railway in the Province, naming the important places on each line. (8) Locate the principal lumbering, agricultural, and mineral regions. (9) Name and locate the principal cities and towns. (10) Draw an outline map of the Province, filling in the counties.

the leading industries of Ontario, although very much less grain than formerly is exported. The principal crops are wheat, oats, barley, rye, and buckwheat, while timothy, clover, and peas are extensively grown for feeding purposes. Alfalfa is also an important crop. There are many large flour mills throughout the province, but these do not depend upon the local supply of wheat.

The immense grain elevators at Port Arthur and Fort William are used for handling the grain crops of the Canadian West (Fig. 81).

Fig. 81.

The Canadian Northern Elevator at Port Arthur.

Stock-raising. — For more than half a century Ontario farmers have been rearing fine herds of cattle, both for the home market and for export to other countries. These herds are kept up to a high standard by the importation of choice animals from Great Britain and Holland. Wellington, Wentworth, Middlesex, and York counties are the centres for the production of cattle, but every part of older Ontario has some share in the trade.

Cattle that are well fed from birth are ready for the market, either for home use or for export, at from two to two and a half years of age. They are fed during the summer only on grass, and in the winter are given straw, roots, and corn, with usually some grain. Export cattle are generally fattened as much as possible on grass, as it is much cheaper to feed them in the field than in the stable, and they are shipped from Montreal to Liverpool and other British ports in July and August. Those cattle slaughtered in Canada furnish hides which supply us with leather for heavy boots and shoes, harness, saddles, belting, carriage tops, bookbindings, and chair and couch coverings. The hides must first be *tanned*, or put through a process that will remove the hair and make the hide tough and smooth.

They are put into great vats containing *tannic acid*, which is an extract from the bark of the oak or the hemlock. As the Georgian Bay and the Ottawa River districts have immense forests of hemlock, it is here that the large *tanneries* are located. MEAFORD, PENETANG, BRACEBRIDGE, and RENFREW are among the most important.

Sheep-raising is a very profitable branch of stock-farming, especially on land that is dry and rolling, or of a somewhat gravelly soil. The sheep require little attention, give quick returns, and a large part of their food consists of weeds and other rough food that would otherwise be wasted. Their flesh makes very dainty and healthful food, and their wool is used for clothing and many other purposes. Most of the mutton is used at home, although a large trade in shipping lambs to the United States markets is carried on in the fall of the year. About 6,000,000 pounds of wool is produced annually, of which part is exported. There are many fine flocks of sheep in Ontario, and the young stock are eagerly sought after in other parts of Canada and abroad.

For the most part we buy our fine cloth and dress goods from Great Britain or Germany and use our wool for making coarser kinds. The principal factories are: RENFREW, ALMONTE, and CARLETON PLACE in the Ottawa Valley; CORNWALL on the St. Lawrence; BERLIN and WATERLOO on the Grand River; TILSONBURG and SIMCOE near Lake Erie; WINGHAM, WALKERTON, MEAFORD, MITCHELL, and ORILLIA.

Ontario is noted for its horses. The heavy draft breeds, the Clydesdale and the Shire, are the most popular with the farmer, but many fine carriage and roadster horses are also bred. The counties of York, Ontario, Wellington, Perth, Huron, Kent, Middlesex, and Oxford are centres of the horse-breeding industry.

Dairying. — Ontario has about 1200 cheese factories and 300 creameries, which produce an annual product worth in the neighborhood of $15,000,000. Besides these, there are thousands of home butter dairies with six to twenty cows. Both the Dominion and Ontario governments have been very active in educating the people in the science of butter- and cheese-making. The dairy schools at KINGSTON, STRATHROY, and GUELPH (Fig. 82) are models. Travelling dairy schools have also done much to educate the people in the proper handling of milk and in making butter on the farm. Ontario now exports annually three times the butter and cheese exported by the whole of the United States. Almost every part of the province has

cheese factories; but LONDON, WOODSTOCK, INGERSOLL, BRANTFORD, and LISTOWEL in western Ontario and OTTAWA, PERTH, BROCKVILLE, KINGSTON, BELLEVILLE, and PETERBOROUGH in eastern Ontario are the most important centres.

Hog-raising and Pork-packing. — Closely connected with dairying is the raising of hogs. The part of the milk not used in making butter or cheese is a most valuable and even neeessary food for young pigs. The hog industry of Ontario has grown rapidly. Canada exports annually more than $12,000,000 worth of bacon to Great Britain, and the greater part of this eomes from Ontario. Every part of the provinee produees some pork, but the older settled portions have most interest in the export trade.

FIG. 82.
Making butter at the Model Farm, Guelph.

The curing of hams and baeon for export requires so much skill that it must be done by experts. Extensive factories have been established at HAMILTON, LONDON, INGERSOLL, KINCARDINE, OWEN SOUND, TORONTO, PETERBOROUGH, BROCKVILLE, and other centres. Each of these take thousands of hogs from the surrounding farmers.

Poultry, Eggs, and Honey. — Nothing better illustrates the ehanged eonditions of farming than the inereased attention given to rearing poultry. The early settlers of Ontario kept ponltry only to supply themselves with eggs and to add an uncertain revenne for household expenses; the modern farmer in many cases eounts as certainly upon a fixed revenue from dressed ponltry and eggs as from fat eattle or cheese. Improved methods of fattening and cold storage during export are largely responsible for the increased business in this department. The annual prodnct of Ontario is worth not less than $4,000,000.

Beeause of the plentifnl supply of white clover and other flowers, southern Ontario is especially adapted for bee eulture. This work requires much skill and intelligence, and is yearly beeoming more popular. The annual crop is abont 8,000,000 ponnds.

Fruit-raising. — The whole southern peninsula of Ontario between Lakes Eric and Huron is admirably adapted for fruit-growing. The soil is suitable and easily drained, while the immense amount of water in Lakes Huron, Erie, and Ontario tempers the climate at critical periods when a few degrees of frost would prove ruinous. The industry is rapidly increasing, the apple crop alone at the present time being estimated at 50,000,000 bushels annually. The apple region embraces the whole of southern Ontario, including the district around Georgian Bay, but the regions east of Lake Huron and north of Lake Ontario are worthy of special notice. Some fruit has been successfully grown in Muskoka. The Ottawa Valley produces all kinds of small fruits, including grapes and hardy varieties of apples.

FIG. 83.

Fruit farm near Grimsby.

Nearly every farmer in southern Ontario grows some fruit, but certain districts are rapidly being given over wholly to fruit culture. The Niagara peninsula, embracing parts of Lincoln, Welland, and Wentworth counties, contains the most extensive orchards (Fig. 83). Besides the ordinary hardy fruits this region produces immense crops of grapes, peaches, and small fruits. The best peach orchards are found in the strip of land lying along the south shore of Lake Ontario. The Essex peninsula is very similar and produces an abundance of fruit of all kinds.

Pelee Island contains the most extensive vineyards in Canada, the product being largely used for making wine. The total area under vines in Ontario is 15,000 acres.

Closely connected with the fruit business is the **canning** industry. Dozens of canning factories are located along the northern shores of Lakes Ontario and Erie. In addition to the fruits already mentioned, large quantities of tomatoes, peas, and corn are put up in this way both for home consumption and for export. This industry is growing rapidly and promises to become of very great importance.

Tobacco. — The climate of most parts of Ontario is too severe for the raising of the tobacco plant, but about 3,000,000 pounds are produced annually in the counties of Essex and Kent in western Ontario, where the soil and climate are fairly suitable. The country throughout this district is very flat. This tobacco is not equal to that grown in warmer countries where the conditions are entirely favorable (page 207), but the quality is very fair indeed. Most of the product of the Ontario tobacco crop is manufactured into the finished article within the province.

Sugar. — The people of Canada pay every year for sugar and molasses over $6,000,000. Of this amount Ontario pays very nearly one-half. Every form of sugar, whether made from sugar-cane, sugar-beets, or the sugar-maple, comes from the sweet sap of a plant or tree. The cane sugar used in Canada comes largely from the Indies and from the United States. It is brought in as *raw* sugar, that is, it is not wholly cleaned from impurities and must be refined. This process gives us *granulated* sugar. When sugar is made from beets, the juice is extracted and treated in the same way as the juice of the sugar-cane. In a single year Canada paid to Germany nearly $4,000,000 for sugar and molasses made from beets. As experiments showed that Ontario soil would produce sugar-beets of high quality, the legislature offered a bounty for the manufacture of beet sugar. Expensive factories were built at BERLIN (Fig. 84), WALLACEBURG, Dresden, and Wiarton, but the last two of these are not now in operation.

FIG. 84.
Beet sugar factory at Berlin.

The early settlers of Ontario used no sugar except what they made from the sap of the maple trees. Even yet Ontario produces a large amount of this sugar.

Lumbering

This was the pioneer industry of Ontario. The early settlers, while clearing their farms, eked out a living by the sale of pine logs and square timber. Gradually the lumbering area has moved northward, and many districts where it was once the main business cannot now boast of a saw-mill. The province of Ontario, however, still possesses the finest pine areas in the world, and derives a very considerable part of her revenue by selling to lumbermen for a stated term of years the privilege of cutting upon these areas all trees that exceed a fixed diameter. Besides a large cash payment, the lumbermen pay to the Government a yearly ground rent and a tax upon every thousand feet of lumber cut. The land in the end reverts to the province. By recent legislative enactment the exportation of logs cut upon government land either for lumber or pulp is prohibited. This regulation secures to Ontario the manufacture of the logs and thus gives employment to many workmen.

Fig. 85.
Lumber mills at Ottawa

The best lumber regions are now along the Upper Ottawa, north of Georgian Bay and west of Lake Superior. From the Height of Land to James Bay is almost one continuous spruce forest. This spruce is yearly becoming of more importance owing to the demand for spruce-pulp from which paper is made (Fig. 86). Already extensive pulp mills have been established at Sault Ste. Marie,

STURGEON FALLS, OTTAWA, and HAWKESBURY, while others are being erected in the country near Lake of the Woods.

Ontario sends enormous quantities of lumber to Britain, United States, France, Argentina, Brazil, China, and Japan. Every year sees an increase in the export of manufactured lumber in the form of doors, sashes, blinds, and even wooden houses ready to be put together.

Winter is the busy season in the lumber woods. It is often necessary to work when the temperature is far below zero. The swamps, which are numerous and in summer almost impassable, are then frozen over. At that season, also, the snows have levelled over the boulders and fallen trees so that heavy sleds, loaded with logs, may be drawn through the woods.

FIG. 86.
A pile of pulp logs.

Usually fifty men or more are necessary to a logging camp. With axes in hand they go through the woods cutting all the trees that are large and sound enough for good lumber. These are cut down, the limbs chopped off, and the logs dragged by horses or rolled to the banks of the nearest stream. When the snow melts in the spring, the cutting is over and another busy season begins. The logs that are ready are whirled away by the stream current, now swollen by the melting snows, but frequently even the flood of water is not sufficient to carry them. To provide against that difficulty, dams are placed across the stream or at the outlet of lakes to store water for use when needed. Immense numbers of logs are floated or "driven" down-stream, forming what the lumbermen call a "log-drive."

When the logs are to be made into pulp for paper, such as newspaper or wrapping paper, they are first cut into lengths of about two feet and the bark peeled off. These short pieces are then placed in a steel enclosure and forced against an enormous grindstone. The *pulp* thus ground off is carried away by water, run through a sieve, deposited on a wide belt, and compressed into thin sheets between hot steel rollers. When dry it is paper. Pulp is also made by the help of chemicals. When a finer quality of paper is required, rags are mixed with wood-pulp.

Mining

Although Ontario is preëminently an agricultural country its mining interests bid fair to become very important, and already give employment to 10,000 men. Its most serious lack in economic minerals is coal. Up to the present this lack has seriously interfered with the development of rich deposits of excellent iron. Iron occurs in southern Ontario in small quantities in the form of bog-iron ore. This is easily smelted, and the early settlers actually made use of it in the county of Norfolk. The magnetic ores are not so easily smelted, and by far the greater part of the iron in Ontario is of this kind. There are considerable deposits in Frontenac, Hastings, Renfrew, and Haliburton. Extensive deposits also occur along the north shores of Lake Huron. At the present time the province has several furnaces producing a pig-iron from domestic ore, although some ore from the United States is also used. Some furnaces use charcoal and others coke made from Pennsylvania coal. The chief iron works are at Hamilton, Deseronto, Midland, and Sault Ste. Marie (Fig. 87). The Canadian and Ontario governments give bounties on every ton of iron manufactured.

Fig. 87.
Iron works at Sault Ste. Marie.

Iron is the most useful of all the metals. It exists in many minerals and rocks, the red and yellow colors of many soils being due to it. As water slowly seeps through the rocks it dissolves iron much as it would dissolve salt or sugar if these substances were there. In some places the water has brought this dissolved iron and deposited it in *beds* or *veins* of iron ore, and it is these that are now being mined. Sometimes the beds lie very deep, and again they are so near the surface that the iron ore is dug out of great open pits, as stone is taken from quarries. In appearance

iron ore is sometimes a hard, black mineral, sometimes a soft, loose, yellowish or reddish brown earth. It is not iron at all any more than wheat is flour; it is only the iron ore mineral out of which iron may be made by a great deal of work.

Two materials, *coke* and *limestone*, are used with iron ore to reduce it to the metal. The coke is made from bituminous coal, and the limestone is obtained in quarries. To obtain the coke the soft coal is placed in stone or brick furnaces, called *coke ovens*, built in such a manner that very little air can reach the coal, which is then set on fire. Many of the gases that form a part of the coal are thus either burned or driven out. So little air is let into the ovens that not all the substances in the coal are burnt. The part left is a very light porous coke which can then be burnt and made to furnish intense heat if supplied with plenty of air.

The coke, iron ore, and limestone are all placed together in a high, towerlike structure, called a *blast furnace*, so named because a blast of air is forced through it to produce a strong draft while the coke is burning. Such intense heat melts the ore and limestone, and the iron being heavier sinks to the bottom of the fiery hot liquid. The limestone, and those elements of the ore that are not iron, rise to the surface, forming slag, a worthless substance that is drawn off through an opening in the furnace and thrown away. Through a lower opening the iron is run off into trenches made of sand on a sand floor. There is one main trench with numerous side branches, and each of these has still smaller branches connected with it (Fig. 88). When the molten iron cools, the little bars of iron, called *pig iron*, are found to be attached to a larger one. These rough bars are then broken off and shipped away to be made into thousands of different articles.

FIG. 88.

Molten iron running out of a blast furnace into trenches, where it cools to form pig iron.

Some iron goods, such as stoves, car wheels, and the iron parts of school desks, are nothing more than this pig iron melted and cast in moulds into the shape that is desired. This is *cast iron*, which contains one part of carbon to twenty of pure iron, and is so brittle that it breaks under a heavy blow. Other materials, such as knife blades, boiler plates, rails for railways, edged tools, and watchsprings, are made of steel. Steel contains only a very small amount of carbon, and has been toughened by an expensive process of rolling and hammering. *Wrought iron*, a third kind, is almost pure iron, and is used where it is necessary for the metal to bend and yet be tough, as in iron wire, horseshoes, bolts. The moulder

works with *cast iron ;* the blacksmith with *wrought iron* and *steel ;* the tool maker and cutler with *steel* only.

Nickel. — Ontario has the greatest nickel deposits in the world. Pennsylvania and Norway have limited quantities, and France has a rich mine at New Caledonia. Outside of this Ontario must supply the world, and the metal is yearly coming into more general use, as a valuable alloy to mix with steel, where lightness combined with great strength is required. With the Ontario nickel is mixed copper of almost equal value. The SUDBURY nickel mines are practically inexhaustible. **Cobalt** is found exclusively in northern Ontario.

Silver. — The north shore of Lake Superior was formerly the great silver-mining district of Ontario. Recent discoveries in the Temiscaming district show that the whole northern region is very rich in silver. Indeed, it is expected that this section will soon be the great silver-producing district of the world. The Ontario government have recently determined to hold back large blocks of this land to be mined for the benefit of the province.

Gold is mined to a limited extent in Hastings County and around the Lake of the Woods. The deposits are in the form of quartz, which must be crushed before the gold can be extracted.

Graphite of a good quality is mined in Renfrew County. Some **mica** is taken out in the Ottawa Valley, and finds a ready sale in the United States. Recently a stone, called **corundum**, has been discovered in Hastings and Haliburton. The corundum is the next hardest substance to diamond, and is used as a substitute for emery wheels in polishing and grinding metals. The corundum is much harder than emery, and superior to it for grinding purposes. In many of the large saw-mills of Ontario the steel saws are sharpened on corundum wheels driven by machinery. One man can, in this way, do the work that used to require six men.

Southern Ontario has none of the minerals found in other parts of the province. It has, however, three mineral products of great importance, — salt, petroleum, and natural gas.

Salt is found east of Lake Huron, in the neighborhood of Goderich and Seaforth. When in the earth salt is hard, somewhat like coal, and must be obtained in one of two ways. In one case a small hole is bored to it, and water allowed to run down and dissolve it, then the *brine* is pumped up and the water is evaporated by heat until only the salt is left. In the other case a *shaft* is sunk and the salt broken off in lumps and hoisted to the surface. In Ontario the salt is pumped to the surface in the form of brine.

Petroleum means "rock-oil," a name which suggests its origin. It is found by going into the earth from 400 to 1500 feet or more. The crude petroleum is black like tar. It yields coal oil, benzine, naphtha, vaseline, dyes, and wax for candles. Sometimes the petroleum flows out when a hole is bored. Usually it must be pumped. The chief centres are at PETROLEA (Fig. 89), OIL CITY, and BOTHWELL.

Natural Gas is found in Welland and in Essex at a depth of about one thousand feet. It is used as fuel for houses and factories, and for lighting purposes. In one case it has been used continuously since 1894 to burn lime.

Peat.—Eastern Ontario has several deposits of excellent peat. Experiments are now being made with this fuel and some of it has been put on the market. The peat is dried until it contains only between 10 and 12 per cent of water and then made into cylindrical cakes by hydraulic pressure. This fuel is clean, easily handled, gives off a pleasant odor, and is said to contain more than 50 per cent as much heat as anthracite coal.

FIG. 89.
Scene at Petrolea, showing oil tanks and derricks used in boring for oil.

Glass.—Three other mineral products are worthy of note, — glass, pottery, and bricks. Glass is made at HAMILTON and other places. The principal substance in its manufacture is sand melted and mixed with soda. The molten glass is fashioned by glass-blowers into such useful articles as lamp chimneys, fruit jars, and druggists' bottles.

Pottery, such as stone jugs, butter jars, and glazed crocks, is made of clay found near BRANTFORD.

Bricks and drain tiles are made in almost every part of the province, but the clay near TORONTO, at MILTON, and at BEAMSVILLE is of a superior quality, and is used in making pressed bricks of high grade. Very fine white bricks are made of the clays found near LONDON and PETERBOROUGH.

MANUFACTURING

Many of the manufactures of Ontario have already been named in connection with the agricultural, timber, and mineral resources. Factories are scattered all over the province; indeed there is scarcely a village that has not one or more manufacturing establishments. The most important manufactures are agricultural implements, heavy machinery of all kinds, musical instruments, furniture, pulp-wood, paper, cotton and woollen goods, coal-oil, salt, flour, cheese, butter, leather, boots, bricks, soap, etc. The province possesses unrivalled water-power, and in addition the transmission of electrical power from Niagara Falls will do much to cheapen the cost of manufacture and so encourage the growth of new industries.

Fishing

The fisheries of the Great Lakes and inland waters of Ontario are among the best of any fresh-water fisheries in the world. About 3000 people earn their living in the fisheries. As yet only the Great Lakes and the most easily accessible of the inland lakes have had their resources developed. As settlement spreads, many of the northern lakes will prove to be well stocked with fish. The government encourages the industry by prohibiting the taking of fish during the spawning season and also by restocking the waters with certain kinds of fish.

Fig. 90.
A catch of whitefish on Lake Superior.

The fish of Ontario are mostly for home consumption, but some of the best are exported to American cities. The three most important kinds are the **lake trout**, found chiefly in Georgian Bay; the **whitefish**, occurring most plentifully in Lake Superior (Fig. 90); and the **herring**, which is really not a herring, but a species of whitefish found chiefly in Lake Huron. **Sturgeon** and whitefish are very plentiful in the Lake of the Woods. Many of the rivers all over the province, especially those running into Lake Superior on the north, are stocked with the **speckled trout**, the most beautiful and gamiest fish in the world. **Bass** are also plentiful in the interior streams.

Hunting and Trapping

Northern Ontario offers a good field for the hunter who merely wishes good sport or for the trapper who wishes to make a living. Deer are plentiful as far south as Muskoka and the Upper Ottawa. Farther north are moose. Hudson Bay trappers traverse the north country almost exactly as they did 200 years ago. Bears, foxes, mink, and other fur-bearing animals are found there. Wolves are common in the unsettled northern parts, and the provincial Government pays a bounty of $15 on every wolf's head. The wolves are very destructive to the deer, especially in the late winter, when the former are famished and the latter are unable to run owing to the deep snow.

So famous are the hunting grounds of northern Ontario that sportsmen come there from all parts of the United States. They pay for and secure special licenses from the provincial game warden, but they are allowed to take away with them only a limited amount of game.

Transportation

Waterways. — Scarcely any part of America enjoys a more complete system of railways and waterways. The Great Lakes[1] furnish a natural highway of untold value. The St. Mary and Welland canals make the system complete from Lake Superior to Lake Ontario. The rapids of the St. Lawrence are passable for boats on the down trip, and excellent canals have been constructed for the return trip. The Rideau Canal from Kingston to Ottawa is shallow, but moves a considerable amount of freight in boats of light draught. The Trent Valley Canal is being completed and will connect Georgian Bay and the Bay of Quinté, opening up a rich country around Peterboro and using the natural chain of lakes and rivers whenever possible. The hydraulic lift-lock on this canal has a lift of sixty-five feet, and is, at present, the only one of its kind on the continent. The Ottawa is navigable from Montreal to Ottawa city with the aid of a short canal. Several vessels ply on the navigable stretches of the Upper Ottawa. Steamboats have been running for some time on the Muskoka Lakes, and recently some have been put on Lake Temiscaming. *See Appendix A.*

Canada has spent upon her inland waters no less a sum than $100,000,000. Nearly all of this amount has been spent upon the Great Lakes and St. Lawrence system. Since Confederation the total revenue from the canals has been about $12,000,000 collected as tolls. The Welland Canal alone has cost about $25,000,000. It was opened for traffic in 1829 and at first was navigable only for boats drawing about

The St. Lawrence Lakes	Length	Average Width	Area	Height above Sea
Name of Lake	Miles	Miles	Square Miles	Feet
Superior	420	80	31,420	602.75
Michigan	350	60	26,000	578.75
Huron	270	70	23,780	576.75
St. Clair	25	25	360	570.75
Erie	250	38	10,030	566.75
Ontario	190	55	7,330	240

four feet of water. It was enlarged in 1845 and again in 1850. Later it was so changed as to make it almost wholly a new canal. The St. Lawrence Canals were opened for traffic in 1848.

The Murray Canal, about six or eight miles in length, was built at a cost of $1,250,000 to enable vessels to pass from the Bay of Quinté directly west to Lake Ontario.

The Trent Valley Canal, which promises to be one of the most important of the waterways, has already cost over $4,000,000. Sault Ste. Marie Canal was built in 1895 at a cost of about $4,000,000, in order that Canadians might have a waterway wholly upon their own soil (Fig. 91).

FIG. 91.

Lock on the St. Mary's River at Sault Ste. Marie.

It is so much superior to the one on the American side that its annual tonnage is yearly increasing.

Closely connected with ocean and river navigation is the protection of vessels during dark nights and stormy weather. Dangerous rocks, sandbars, and shoals must be marked out, and proper signals given. The Dominion Government maintain in the province of Ontario alone 203 lighthouses having 267 lamps and 187 keepers. These lighthouses are placed at intervals from Cornwall to Port Arthur on Lake Superior. There are also a few along the Ottawa River. Sometimes the lighthouses are on the shore, sometimes on an island near the main channel of the river. The keeper either lives in the lighthouse or has his home beside it. At the present time many of the lighthouses are being equipped with acety-

lene gas. Once every year a supply ship of the Dominion Government visits each lighthouse and leaves with the keeper such things as are necessary. Besides lighthouses there are fog-horns, fog-whistles, gas-buoys, and bell-buoys to mark the dangerous places or to guide the helmsman through a safe passage. Lake Erie is the most dangerous of the Great Lakes because it is very shallow and storms arise with little warning.

Railways. — Ontario has 7000 miles of railroad. This gives the southern part of the province good shipping facilities. The Ontario Government is now building a line from North Bay to open up the fertile districts west of Lake Temiscaming. This road will, in all probability, be extended to James Bay.

The projected Grand Trunk Pacific will cross northern Ontario and open up vast latent resources. Lumber, spruce, and perhaps some minerals are there in abundance. Branch lines will be built from places already settled to meet the new road, and in this way the whole northern country will be opened up for settlement.

The first railway in Ontario was the Northern from Toronto to Bradford. The first sod was turned by Lady Elgin in 1850, and in 1853 the road was opened for traffic. The Grand Trunk Railway was commenced in 1852 and opened for traffic between Montreal and Toronto in 1856. The main line of the Great Western Railway from Niagara Falls to Windsor was opened in 1854, and the following year the suspension bridge was completed. The first survey of the Canadian Pacific Railway was made in 1871, the first sod turned in 1881, and the road completed in 1885. There have been railways built in Ontario by scores of different companies, but at the present time these lines, with the exception of a few, are operated by either the Grand Trunk or the Canadian Pacific. One of these roads and often both of them have access to every place of importance in the province.

FIG. 92.

Entrance to the Grand Trunk Railway tunnel under the St. Clair River.

The Ottawa and Parry Sound runs from Ottawa to Parry Sound and opens up a country but little developed. The Kingston and Pembroke connects Kingston and Renfrew, and passes through a region rich in minerals.

The Michigan Central, the Père Marquette, and the Wabash railways connect various points in the southern part of the province. The Toronto, Hamilton, and Buffalo have a line from Buffalo to Waterford by way of Hamilton. The Canadian Northern will have shortly a line, known as the James Bay Railway, in operation from Toronto to Sudbury.

Electric Railways. — The first street railways in Canada were operated in Toronto and Montreal in 1861. These were rude affairs, consisting of tram-cars running on light rails and drawn by a single horse. In time these were much improved and every city of importance had its street railway. The first city in Ontario to use electric cars was Ottawa, where they were successfully operated in 1890. The pioneer road in western Ontario was the Metropolitan, running north from Toronto on Yonge Street.

At the present time Ontario has about 500 miles of electric railway, and this amount is rapidly increasing. The electric railway is being extended from every large city into the surrounding country. Lines now radiate from Toronto in all directions. A line runs east from Hamilton almost to St. Catharines through the great fruit belt. Another line runs from St. Catharines to Niagara and makes connections with an American road for Buffalo. Galt and Berlin, Brantford and Paris, and Woodstock and Ingersoll are also connected by electric lines. Many roads are being projected through the rural districts, and this method of transportation, both for passengers and freight, will no doubt become more and more popular.

Cities

Toronto, the first city in size and the capital of Ontario, has had a rapid growth, especially during the last quarter century. It is situated on Toronto Bay, having as a breakwater a series of islands, which form one of the most pleasing features of the city's park system. The city contains the Legislative Buildings for Ontario (Fig. 97), and in addition is the seat of many educational institutions. Of these the first in importance is Toronto University, with its affiliated colleges, Victoria, Trinity, Knox, St. Michaels, and the Medical College. All of these colleges have handsome buildings of their own. McMaster is an independent university under Baptist control. Upper Canada and St. Andrew's colleges are important boys' schools, and there are many schools for girls. One of the provincial Normal Schools is situated here, and the school buildings, both public and high, are worthy of special note. The City Hall is one of the finest municipal buildings on the continent. The churches are numerous and beautiful. As a city of parks and residences, Toronto is unsurpassed in Canada.

Toronto has many factories, especially of the sort that manufacture clothing and light articles such as boots and shoes, trunks, jewellery, tinware, and soap. There are also several factories for the manufacture of such heavy articles as engines, farm machinery, pianos, furniture, elevators,

windmills, and stoves. It is, however, predominently a city of wholesale warehouses. It is a distributing centre for the whole of western and northern Ontario, and has also a large trade with the West. Its splendid railway and steamboat connections make it a centre for the distribution of foods, especially fruit, meat, and dairy produce. These travelling facilities, together with its cool summer climate and its proximity to the Muskoka Lakes, make it a favorite stopping-place for tourists.

FIG. 93.
City Hall, Toronto.

OTTAWA, the second city in Ontario, owes its importance to its being the seat of the Federal government and to the lumber trade. Its situation is beautiful and its natural advantages many. The view from Parliament Hill, with the Ottawa hundreds of feet below and the Laurentian Mountains in the distance, is one of never-failing interest. The main Parliament Building, with the several departmental buildings, form an imposing group. The excellent water-power from the Chaudière lights the city, runs its street cars, and drives its sawmills and factories. From May to November the big mills run night and day. Lumber piles, thirty feet high, cover acres and acres, and represent millions of dollars. It is the seat of the University of Ottawa and of one of the provincial Normal Schools. Rideau Hall, the official residence of the Governor-General, is situated in a beautiful park at the extreme east of the city. Ottawa is rapidly becoming a railway centre, and it has steamboat connection with Montreal by the Ottawa River and with Kingston by the Rideau Canal.

FIG. 94.
Ontario Normal College, Hamilton.

HAMILTON, the third city of Ontario, is a solid, progressive city with a picturesque situation on the mountain side at the head of Lake Ontario. It has a large local trade in grain, fruit, and meat. It is especially noted for its manufacture of heavy machinery, agricultural implements, iron, glass, steel bridges, stoves, cotton, clothing, etc. Besides a smelting works where pig iron is made, it also contains a rolling-mill where the pig iron is made into wrought iron. Hamilton is now using electrical energy developed at Niagara Falls. Ontario Normal College is located there.

LONDON is situated at the union of the north and south branches of the river Thames, in the heart of a rich agricultural district. On the branches of the Thames the current is sufficiently rapid to afford considerable water-power. Its central position on the Grand Trunk and Canadian Pacific railways and connections with other lines have greatly contributed to its growth and given it command of the distribution of trade for southwest Ontario. The city has extensive manufactures of stoves and stove furnishings, confectionery, cigars, malt liquors, machinery, railway cars, carriages, etc. It is the seat of one of the provincial Normal Schools, of the Western University with its theological and medical colleges, and of two large hospitals.

Brantford, named after the famous Indian chief, Brant, is situated on the Grand River, in the centre of a rich agricultural country. Its chief industry is the manufacture of farm implements. It also manufactures woollen goods, paper, nails, malleable iron, etc., and stands third in the Dominion in the export of manufactured articles. Owing to its beautiful location, fine buildings, and early history, Brantford is one of the most interesting of the Canadian cities. Its chief buildings are the Carnegie Library, the Home for Widows and Orphans, and the provincial Institute for the Blind.

Kingston enjoys a fine situation on Lake Ontario and is a shipping point of some importance. The chief industries are the manufacture of cotton and of locomotive engines. Queen's University and the Royal Military College give the city more than local fame, while the School of Mines in connection with the University is an institution of national importance. The Eastern Ontario Dairy School is doing much to educate the surrounding district in a great industry. Just outside the city proper is a large penitentiary under control of the Dominion Government.

Windsor, opposite Detroit on the Detroit River, has a large local trade and some shipping. Near it is the town of Walkerville, containing one of the largest distilleries in Canada. From Windsor the through railway trains for Chicago are ferried over to Detroit.

St. Thomas, the first town founded in the Talbot Settlement, 1810, is

frequ ntly called the "Railroad City." This title it owes to the fact that the Canada Southern Division of the Michigan Central Railway has its shops, employing 400 to 500 hands, there, and to the fact that all the railways passing across southern Ontario intersect there. In addition to the railway interests, St. Thomas has several large foundries and factories of various kinds. It is also the seat of Alma Ladies' College.

Guelph, founded by John Galt in 1827, is located on the river Speed, from which it derives its water-power. Guelph owes its chief importance to the fact that it is surrounded by excellent grazing and farming lands. Its chief trade is, therefore, in farm produce and livestock. Near it are the Provincial Model Farm, the Agricultural College, the Macdonald Institute, the Consolidated School, Massey Library, and the Biological Building. The city has also extensive manufactures, as furniture, stoves, carriages, organs, pianos, and flour.

Stratford is situated in the ce · of a fine agricultural district. The city itself has large manufactur erests, such as the making of furniture, clothing, agricultural imp ts, flour, woollen goods, and iron bridges. It is also a railroad centre, and the Grand Trunk Railway repair shops, employing nearly 1000 hands, are situated there.

Chatham, originally a French settlement, has developed into a prosperous manufacturing and distributing centre. It is situated on the Grand River in the midst of a very fertile district. Hence, one of the industries is the trade in garden truck, such as beans, tobacco, sugar-beets, corn, etc. Large quantities of lumber are manufactured into carriages, wagons, office fixtures. Chatham is, too, the best poultry market in Canada. Close at hand is the famous battle-field where the Indian chief, Tecumseh, fell during the War of 1812.

Belleville is a quiet but prosperous city on the Bay of Quinté. Its chief exports are grain, lumber, and cheese. It is favorably known for its rolling mills. Albert College is situated there, and also the provincial Institute for the Deaf and Dumb.

St. Catharines, on the Welland Canal, four miles from Lake Ontario, is situated in the heart of the Niagara fruit district. The mineral springs and the healthful situation of the town make it a popular health resort. The Welland Canal gives ample water-power for the industries, which are principally flour-milling, paper-making, and the manufacture of edged tools.

Niagara Falls was formed in 1904 by the union of Niagara Falls (Clifton) and Niagara Falls South (Drummondville). It has excellent communication with the United States by means of the new bridges across the Niagara River. The development of electrical energy by means of the water-power from the Falls has resulted in the establishment of many industrial enterprises. The city is a favorite resort for tourists both in the summer and the winter season.

Woodstock, the "Industrial City," is beautifully situated on the Thames River in the centre of an excellent farming country. Both the Grand Trunk and Canadian Pacific railways touch at Woodstock. Among the

more important manufactures are agricultural implements, organs, wagons, furniture, stoves, etc. The city presents a substantial and prosperous appearance, the public buildings being especially fine. The Young Men's College is situated here.

Peterborough is situated in the centre of a district which is a popular resort for the hunter, the fisher, and the summer tourist. The Otonabee River, down which pours the water of a large number of beautiful lakes, gives the city its most valuable asset by furnishing the electric power by which most of the factories are operated and to which its industrial progress is mainly owing. The city possesses many extensive manufacturing establishments, the output of which consists chiefly of electrical machinery and supplies, cereals, woollen goods, steam-boilers, mining and hydraulic machinery, agricultural implements, pork-packing products, lumber, canoes, and binder twine.

Towns

In no part of the world can there be found cleaner, neater, or more progressive towns than in the province of Ontario. A town may have as few as a thousand people or it may have as many as 10,000. It has more municipal power and privileges than an incorporated village, and less than an incorporated city.

Ontario towns usually include three classes of people. There are those who are engaged in some productive industry, as the making of cottons and woollens in CORNWALL or the manufacture of saws and other steel goods in GALT; there are the grocers, butchers, dry-goods merchants, and professional men who supply the people with food and clothing and look after their other wants; there are those who have retired from active business and are living in the town because of its educational, social, or other advantages.

Some towns owe their importance largely to their water-power, which gives them a great advantage as manufacturing centres. GANANOQUE on the St. Lawrence, PARIS on the Grand River, SAULT STE. MARIE on the St. Mary River, and STURGEON FALLS on the Sturgeon River are good examples. Others have become important places because of their situation along a river or lake in the neighborhood of great timber areas. Saw-mills are built to cut the lumber, and other industries grow up around that of lumbering, as at ARNPRIOR, RENFREW, and HAWKESBURY on the Ottawa, and KENORA (Rat Portage) on Lake of the Woods. Other towns have become important centres because of their good harbors, such as PORT HOPE, COBOURG, OWEN SOUND, GODERICH, COLLINGWOOD,

PORT ARTHUR, and FORT WILLIAM. Sometimes a town has grown almost wholly with the growth of a railroad. Its importance is increased by its position as a junction or by the establishment of car-shops. CARLETON PLACE, near Ottawa, and TORONTO JUNCTION, near Toronto, are examples of this.

By far the greater number of Ontario towns, however, owe their importance to two or more of the causes stated above and also to the fact that they are situated in the heart of a rich agricultural country, and hence form the distributing point for all kinds of supplies to the farmers, and the centre for the collection and export of the farm produce. Such towns may have some important manufactures, but their chief importance is due to local trade. BROCKVILLE, LINDSAY, STRATHROY, and ORANGEVILLE are familiar examples. A few towns, such as SUDBURY and PETROLEA, owe their importance wholly to their mineral wealth. COBALT, NEW LISKEARD, and HAILEYBURY are important mining and agricultural centres. Other important towns are BARRIE, ORILLIA, NAPANEE, DESERONTO, PERTH, BERLIN, SOUTHAMPTON, and KINCARDINE.

SUMMER RESORTS AND TOURIST ROUTES

Ontario is becoming more and more a favorite spot for tourists. Each succeeding year brings an increased number of visitors who desire rest and change of scene. These tourists bring into the country a large amount of money, all of which is distributed among Ontario farmers, merchants, and transportation companies.

FIG. 95.
A scene in Georgian Bay.

The MUSKOKA LAKES are reached after a few hours' run from Toronto. Nature here has grouped every form of beauty to set forth a series of enchanting surprises for the visitor. Lakes large and small cover about one-third of the land area. These are studded with innumerable islands clothed with evergreens or with clumps of maple and beech, and with shores fringed with paper birch and silver poplar. The summer tourist may buy or rent an island

of any size, from an acre to a thousand acres. He may camp in a tent, build a summer cottage, or board in one of the luxurious hotels on Lakes Rosseau, Joseph, or Muskoka.

In addition to Muskoka every town and village on Georgian Bay (Fig. 95) is a summer resort; KILLARNEY, PARRY SOUND, COLLINGWOOD, OWEN SOUND, MEAFORD, WIARTON, GODERICH, and SARNIA all have attractions and good accommodation for tourists.

PORT DOVER, PORT STANLEY, and PORT COLBORNE on Lake Erie all have large summer populations. CRYSTAL BEACH on Lake Erie is a favorite resort for people from Buffalo; GRIMSBY, on Lake Ontario, draws many people from Brantford, Hamilton, Toronto, and more distant places. NIAGARA FALLS always attracts many visitors during the summer. WHITBY, PORT HOPE, and COBOURG have a local importance as summer resorts and offer special attractions to visitors fond of yachting. The Bay

FIG. 96.
View in the Lake of the Thousand Islands.

of Quinté towns — BRIGHTON, BELLEVILLE, TRENTON, and PICTON — have safe harbors, beautiful scenery, regular steamboat connections, and good summer fishing.

Perhaps no summer resorts in the province are more popular than those of the THOUSAND ISLANDS between Kingston and Brockville. Every island is beautifully clothed with trees. The swift flowing of crystal clear rivers seems like bands of silver woven about the numerous islands. Many islands are yet unoccupied and many have cottages on them, some simple and plain, some gorgeously decked out with trimmings, and some stately and grand in red brown stone (Fig. 96).

The UPPER OTTAWA, the beautiful chain of lakes north of PETERBOROUGH, CALEDONIA SPRINGS, PRESTON, and KENORA (Rat Portage), are also favorite summer resorts.

GOVERNMENT

In common with the other provinces of Canada, Ontario has complete control of its own local affairs. At the head of the government

of the province is the *Lieutenant-Governor*, appointed for a term of five years by the Governor-General in Council. The Lieutenant-Governor is the representative of the Sovereign in the province in the same way that the Governor-General represents him in the Dominion. The *Legislative Assembly* consists of ninety-four members, elected by the people of the province for a term not exceeding four years. For the purpose of the election of the members of the Legislative Assembly, the province is divided into electoral districts, each district returning one member. The *Cabinet* or *Executive Council*, at the head of which is the *Premier*, is chosen from the party having the majority in the Legislative Assembly, and is responsible to that body for all its actions. If the Cabinet cannot command a majority in the Assembly it is compelled to resign and to give place to a Cabinet that can secure a majority. All bills before becoming law must be passed by the Legislative Assembly, and must receive the assent of the Lieutenant-Governor. The seat of government is at Toronto, where are the magnificent Parliament buildings (Fig. 97). Ontario elects ninety-two members of the House of Commons, and is represented in the Senate by twenty-four members. There is also in the province a complete system of municipal government for cities, towns, villages, and rural districts. As is the case with all the provinces, Ontario has entire charge of its educational affairs.

FIG. 97.
The provincial Parliament Buildings, Toronto.

FIG. 98.
University College, Toronto.

II. QUEBEC

Physiography. — The St. Lawrence River cuts through the province of Quebec, and it is no exaggeration to say that this is the greatest river in the world. Other rivers may have greater length or more width; some may have more rapids and some richer valleys; no other river has so many attractions. Its islands, its lake expansion, its commerce, its mountain banks, its tributaries, its fisheries, its cities, its lumber rafts, its summer resorts, and its historical associations all unite to make every mile of its course a panorama of varying colors and changing interest. *See Appendix A.*

Fig. 100.
Shawinigan Falls on the St. Maurice River.

Quebec, north of the St. Lawrence, is generally rough and dotted with thousands of lakes. The Laurentian plateau stretches along the north shore of the river and comparatively close to it. The tributaries coming from the Height of Land have therefore to break through this plateau in a succession of cascades and waterfalls. The Shawinigan Falls (Fig. 100) on the *St. Maurice*, and the Montmorency Falls on the river of the same name, seven miles below Quebec, are the most famous. The *Montmorency* makes a sheer leap of 275 feet, dropping in a beautiful, thin white veil. The *Saguenay* River is grand and even gloomy. For miles the rocks rise precipitously 1200 feet (Fig. 101). None of the northern tributaries of the St. Lawrence are navigable except the *Ottawa* and the Saguenay, but all furnish great water-power and a highway for logs.

The Appalachian Mountains skirt the eastern townships on the south and under the name of Notre Dame Mountains extend in a northeasterly direction across to Gaspé. Between the mountains

Fig. 99.

Map Questions.—(1) Trace the boundaries of Quebec. (2) Locate the highlands of the Province. (3) Trace the course of the River St. Lawrence, pointing out its lake expansions and locating the islands. (4) Point out the more important tributaries of the St. Lawrence and trace the course of each. Name and trace the tributaries of the Ottawa River. (5) Locate the canals of the Province, giving the reason for the position

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of each. (6) Point out the larger lakes in the interior. Compare their areas. (7) Locate the principal mineral, agricultural, and lumbering districts. (8) Trace the lines of railway, naming the principal cities and towns on each line. (9) Name and locate the larger cities and towns. (10) Draw a map of the Province, filling in as much detail as possible.

at the extreme south of the province lies a gently rolling country drained by the *Richelieu*, *Yamaska*, *St. Francis*, and *Chaudière* rivers. This is the most fertile section of Quebec. Near the international boundary are the romantic lakes *Memphremagog* and *Megantic*, the head waters of the St. Francis and the Chaudière.

Fig. 101.

Trinity Rock and Cape Trinity, on the Saguenay River.

Beautiful as are the many streams and mountains back from the St. Lawrence, they cannot compare in magnificence with the mighty river itself. From the top of Mount Royal at Montreal and from the cliff at Quebec the view is unsurpassed. The eye can take in a vast sweep of fertile country, and the river, like a broad zone of silver, stretches as far as the sight can reach. Below Quebec the broad estuary river mouth is much like the ocean. The tides rise several feet and leave the boats stranded high and dry, making it possible to load or unload them from carts drawn alongside.

Soil and Climate

Almost everywhere south of the St. Lawrence, except in Gaspé, but especially between the Richelieu and Chaudière rivers, the soil is fertile. A great deal of northern Quebec is barren. Along the north shore, as far east as the island of Orleans, there is a fertile strip of land. The Ottawa Valley has a large district that awaits only railway communication to become a prosperous settlement. The region around Lake St. John has good soil, and is now easily reached by railroad from Quebec. The island of Montreal is very fertile, as is also a considerable area to the north.

A drought in Quebec is almost unknown, and this explains the rapid growth of vegetation. Even in the rough northern districts a very thin layer of soil will produce an abundant crop.

The prevailing winds are either northeast or southwest, that is, up or down the St. Lawrence. In general the climate is more extreme than that of Ontario, which is modified by the Great Lakes. The winters are long and the snowfall everywhere sufficiently abundant to protect vegetation. From December to April the ports of Montreal and Quebec are closed by ice. The lower St. Lawrence is

subject to more severe summer storms than Ontario. Violent downpours of rain occur with very little warning.

Although the eastern part of the province touches salt water, its climate is not thereby much softened, because the cold Labrador Current comes through the Strait of Belle Isle. Then, too, the winds that blow over the Gulf are chilled by the many icebergs in the open sea beyond Newfoundland. The waters of the St. Lawrence are rather cold for bathing, but otherwise the summer climate of the lower St. Lawrence is delightful.

Agriculture

As in Ontario, one of the great industries is the cultivation of the soil. In southern Quebec the same grains are produced as in Ontario, but more flax and tobacco are cultivated. The tobacco crop alone exceeds 4,000,000 pounds a year. Maize is also grown extensively. The north shore of the St. Lawrence below Montreal is one immense hay farm, and much of this is baled and exported. Dairying is an important business, and Quebec is second only to Ontario in this branch of farming. The exports of cheese and butter are large and constantly increasing. The Provincial Dairy School at Compton has much to do with the interest taken in this industry.

The eastern townships are the best farming districts. Thoroughbred cattle and sheep are important sources of revenue. The never failing springs of fresh water add very much to the dairying industry in this region. Stock raised here for export brings the owner a greater return than in western Ontario, because of the difference in freight rates to Montreal.

Along the Lower St. Lawrence the *habitant* is often half-farmer and half-fisherman. He works on his farm, which is usually rocky, when wind and tide do not permit the more attractive occupation of fishing.

In the eastern townships and to a considerable extent throughout the whole province, the making of maple sugar is a typical industry. At the present time the eastern townships have the most modern evaporators and produce sugar and syrup of the finest quality. Some farmers tap 2000 or more trees and get a yearly return of $300 to $400. About 20,000,000 pounds of maple sugar is produced annually in Quebec.

The trees are tapped the latter part of March, and the sugar season lasts from twenty to thirty days. A hole an inch in diameter and one

and one-half or two inches deep is bored into the sugar-maple. A small metal spike is driven into the wood above the hole, and on this is hung a tin pail into which the sap runs. It is an interesting sight to see a maple grove with a glittering tin bucket on the south side of every tree. Early in the season the sap runs only during the day, when the sun is shining. The *boiling down* or *evaporation* is usually done in shallow metal pans, each holding twenty gallons or more and heated by a sort of furnace. The syrup is put into tins holding a gallon or a half-gallon, and sometimes into wooden casks or hogsheads. The farmer gets sixty cents to one dollar a gallon for syrup and eight to twelve cents a pound for sugar.

In the neighborhood of Montreal are many profitable truck farms. Montreal Island is famous for its plums and apples, the Fameuse, a species of snow apple, being worthy of special note. Some fruit is raised along the St. Lawrence, even down to Orleans Island, but the finest and most extensive apple orchards are in the eastern townships.

LUMBERING

Quebec was the first region in America to export lumber and timber to Europe. The province still maintains a foremost place and receives from foreign countries more than $12,000,000 annually for wood products. This is more than double the value of the export of fish and minerals put together.

FIG. 102.
Log jam on the St. Maurice River.

The forest products sent from the port of Quebec embrace many varieties of wood and every form of its manufacture. Sometimes huge trees of oak or pine are squared and sent in lengths of thirty to eighty feet. Planks, boards, laths, shingles, pickets, barrel staves, hoops, match blocks, telegraph poles, cedar posts, railway ties, are some of the varieties. More pine and spruce are exported than any other varieties. Cedar is the chief material used for shingles. Birch, oak, elm, and hemlock are sent in lesser quantities.

The bulk of the timber product is exported to Great Britain and the United States, but there is considerable trade with France,

Germany, Spain, Brazil, Argentina, South Africa, the West Indies, Japan, and China.

The French are good woodmen. Hardy and industrious, but fond of excitement and company, they are more attracted by a life in the lumber-camp than by the cultivation of the soil. As expert raftsmen and river drivers they are unequalled. More than two centuries of experience on the swift currents of the Upper Ottawa and the St. Maurice have made them as much at home on a log or a raft as an Indian is in a bark canoe. Every stream tributary to the St. Lawrence furnishes some logs, but the regions drained by the Upper Ottawa, the St. Maurice, and Lake St. John are most important. The immense rafts are taken down to Quebec and there broken up for shipment. *See page 101.*

FIG. 103.
Pulp works at Grand Mère.

Every year the pulp industry is being extended, and as the spruce forests are almost boundless, its possibilities are great. Pulp mills are established at HULL, on the Ottawa, on the St. Maurice (Fig. 103), on the Saguenay, and at other points. South of the St. Lawrence are great areas of hardwood forests that will yet prove of great value for manufacturing purposes. As in Ontario the best lumbering areas are on lands leased by the Provincial Government.

MINING

While Quebec does not compare in mineral wealth with some of the other provinces, yet there are quite a number of minerals found and somewhat extensive operations are carried on.

Iron. — The bog-iron ores near Three Rivers attracted the attention of Governor Frontenac in the seventeenth century, and he reported to the king of France in favor of establishing smelting furnaces. A smelter was actually established in 1637 and continued in operation for more than two hundred years. Larger furnaces were then erected, and are yet in operation. The bog-iron ore is rather widely distributed around the St. Maurice

on the north and the St. Francis on the south. Smelters are in operation at DRUMMONDVILLE and at RADNOR. A considerable supply of ore is now procured from Lac la Tortue by dredging. The product of these furnaces is largely used for making car wheels. *See page 102.*

Quebec has extensive deposits of magnetic ore in the neighborhood of Hull on the Ottawa and in the eastern townships. These might be profitably smelted with cheap coal but not with charcoal. Some years ago a charcoal smelter was operated at Hull, but the venture did not prove profitable. The discovery of some process by which the ore can be smelted by electricity may yet make the Ottawa district a centre for the manufacture of iron and steel.

Asbestos. — Quebec has the finest deposits of asbestos known to exist in America. Asbestos is a peculiar mineral rock capable of being crushed and spun or woven like wool. Its economic value consists in its being fireproof. It can thus be used for ropes, firemen's coats, lining for fire-proof curtains, and packing for steam-pipes. It is also crushed and used for plaster and paint. The most important deposits are in the counties of Richmond and Megantic. It is taken from open mines sometimes a hundred feet deep.

Copper is found in the eastern townships. It is shipped to the United States to be refined. The ore also yields a small percentage of silver. Copper is valuable in many ways. It is one of the metals used to make bronze and also brass; but of late years the wide introduction of electricity has created a new and even greater demand for this metal. Since copper is a substance which transmits electricity with much less resistance than other common metals, it is the best material for trolley wires, the wire of long-distance telephones, electric bells in houses, etc.

Gold is found chiefly in the valley of the Chaudière in the beds of ancient river gravels. It occurs mostly as coarse nuggets. Those deposits are sometimes covered with a glacial drift to a depth of more than a hundred feet.

The region of the Gatineau and Lièvre rivers produces a fine quality of **mica** and some **plumbago**. Good **slate** is mined in the eastern townships. **Building stone** of great variety is everywhere abundant. **Peat** is plentiful along the St. Lawrence both above and below Montreal. **Petroleum** is found in Gaspé, but so far the borings do not show that it is in paying quantities.

FISHING

The fisheries of Quebec yield between $2,000,000 and $3,000,000 annually. Besides the fresh-water fisheries of the St. Lawrence and its tributaries those of the Gulf are easily reached by the people of Quebec. The cod is the most important, and it is worthy of note that the finest cod in the world are cured on Gaspé coast. The cod fishery in Quebec is mostly carried on in open boats manned by two

men who fish with hook and line. These small boats often venture out fifteen or twenty miles.

Cod are greedy feeders but particular about bait. Caplin, a small fish like a sardine, mackerel, clams, and squid, a species of cephalopod, are used. It is said that the bait used in the cod-fishery costs one-fourth the value of the cod. Every part of the cod is of use. The tongues are good food, the liver gives cod-liver oil, and the air-bladders furnish isinglass, while the bones make a valuable fertilizer. Codfish are sold either fresh or salt. In order to salt or *cure* them they are split open and cleaned, soaked in barrels of brine, and then dried upon racks raised two or three feet about the wharf. Sometimes the bones are removed, the skin stripped off, and the flesh torn into shreds and packed into boxes as boneless cod. Cod fishing from open boats is dangerous because the men must venture out in small flat-bottomed boats called *dories* to take the fish off the trawls. While they are busy a storm may rise or a heavy fog come up and prevent their return.

Mackerel are obtained in spring and summer. They swim together in such numbers — in *schools*, as fishermen say — that they make a great commotion in the water. When the fishermen sight a "school," they spring into their great seine boats, drop a large *seine* or net into the water, and endeavor to draw it around the school. Then the seine is hauled in, forming a pocket and entrapping the fish. In this pocket enough fish are sometimes caught to fill hundreds of barrels. Some are sold fresh, and others are salted and sold as salt mackerel.

Lobster fishing is carried on close to the coast. A lobster-trap, something like a huge round wicker basket, is weighted with stone and lowered to the bottom, where the lobster lives, crawling around among the rocks and seaweed. A fish-head for bait is inside the trap, and the lobster crawls in to get it; he is so stupid that he rarely finds his way out. When lobsters are caught, they have a beautiful green color. It is only after they have been scalded by being plunged in boiling water that they become red.

The **salmon** and **herring** fisheries are also very important, Quebec possessing some of the finest salmon streams in the world.

To encourage the development of the fisheries the Dominion Government pays a bounty of $160,000 a year to fishermen. Some 8000 fishermen of Quebec province share in this bounty, and although they average only $4 or $5 each, yet this small amount will buy a barrel of flour for the fisherman's family. The fish are exported chiefly to Spain, Italy, the West Indies, and the United States.

Manufacturing

Quebec has many manufactures of the first importance, the products, however, being largely for consumption in Canada. Water-

power, of which the province has an abundance, is being used more and more, and this is making up for the lack of cheap coal, which in the past has somewhat hindered manufacturing enterprise. Many of the leading manufactures have already been noted, particularly butter, cheese, maple sugar, lumber products, pulp, and machinery. In addition there are extensive cotton (Fig. 104) and woollen mills, sugar refineries, tanneries, and boot and shoe factories. The manufacture of india rubber, furs, and hats gives employment to a large number of people.

FIG. 104.
Cotton mill below Montmorency Falls.

TRANSPORTATION

Although Quebec has not one-half as many miles of railway as Ontario, yet the distribution of population is such that every part of the province is well supplied. The principal lines are the Intercolonial Railway, connecting Montreal with Halifax and Sydney, the Canadian Pacific, and the Grand Trunk. Montreal and Quebec have direct water communication with all parts of the world. Steamboats ply on the principal rivers, both for passenger and freight service. A line of steamships plies regularly, during the summer months, between Montreal and Toronto. The magnificent series of canals along the St. Lawrence, constructed by the Dominion Government for the purpose of overcoming obstructions to navigation, have made the river accessible to vessels of even heavy draft.

SUMMER RESORTS

Quebec is so rich in historical associations and possesses such picturesque and varied scenery, that during the summer months it is a constant resort for tourists. The cities of MONTREAL and QUEBEC, the falls of the Montmorency, the Saguenay, and the

habitants themselves are sources of never failing pleasure to the stream of visitors. The south shore of the St. Lawrence has a number of famous summer resorts, of which RIVIÈRE DU LOUP, METIS, CACUNA, and RIMOUSKI are the chief. MURRAY BAY and TADOUSSAC on the north shore have many summer visitors, quite a number of whom have permanent cottages there.

SPORTING

Quebec is the paradise of the sportsman, and many visitors are every year attracted to one part of the province or another by the hunting and the fishing. The province has some of the most noted salmon streams in the world, and the fishing everywhere is excellent. Game of all kinds abounds in the northern and eastern sections of the country.

CITIES AND TOWNS

MONTREAL, situated on Montreal Island, just below the junction of the Ottawa and the St. Lawrence, is the commercial metropolis and the largest city in Canada. It extends from the river bank to Mount Royal, around the base of which are many beautiful residences, one of the striking features of Montreal. The city is interesting from the historical standpoint, many relics of the French occupation still remaining, one of the most noted being the Château de Ramezay, once the home of the governors of Canada. Many beautiful monuments also adorn the city, that to Maisonneuve, the founder of Montreal, being the most conspicuous. Montreal contains some beautiful churches, such as the parish church of Notre Dame, which seats 15,000 people, the Cathedral of St. James, an almost exact reproduction on a small scale of St. Peter's at Rome, Christ Church Cathedral, and many others. Here also is situated McGill University, with its magnificent buildings of Arts, Science, and Medicine; McGill Normal School; Laval University, and Bishop's College Medical School. There are

FIG. 105.
Royal Victoria Hospital, Montreal.

also many theological colleges, convent schools, and institutions for the Deaf and Dumb and for the Blind. Montreal is particularly noted for its hospitals, the most important being the Royal Victoria (Fig. 105), Montreal General, Hôtel Dieu, Notre Dame, and Grey Nuns'. Owing to its historical associations, the beauty of its situation, and its interesting surroundings, Montreal is visited each year by thousands of tourists. More than one-half of the population is French Canadian.

Montreal has direct steamship communication with European ports, with Quebec, Ottawa, and with ports on Lake Ontario and on the upper lakes, and is the chief port of entry for Canadian exports and imports. The abundant water-power supplied by the rapids above Montreal gives the city a good opportunity to develop manufactures. These are principally cotton, woollens, sugar, clothing, boots and shoes, paints, furs, nails, tobacco, and rubber goods. Montreal is also the headquarters for the Canadian Pacific and Grand Trunk Railways. The car-shops and general offices of these railways give employment to thousands of men. Here also is the western terminus of the Intercolonial Railway. WESTMOUNT and ST. HENRI are important suburbs of Montreal.

FIG. 106.
The city of Quebec from Point Levis.

QUEBEC, founded by Champlain in 1608, is the oldest city in Canada and one of the oldest in America. It has an unrivalled situation on the plateau known as Cape Diamond (Fig. 106). The St. Charles River banks the city on the east and the Plains of Abraham on the west, while the broad St. Lawrence gives a grand outlook on the south. The city is rich in historical memories, and many buildings are yet standing which link the French régime with the twentieth century. Laval University and Normal School are situated here. An electric railway runs east along the north shore to the beautiful Falls of Montmorency. Château Frontenac has the finest outlook of any hotel in America. The city is a favorite resort for tourists.

Quebec is connected with Montreal by a branch line of the Canadian Pacific Railway, and with Lake St. John by the Quebec and Lake St. John Railway. The Intercolonial Railway touches at Levis immediately across the river. In addition to its shipping trade, the city is a great lumbering and manufacturing centre. The principal manufactures are leather, boots and shoes, furs, soap, and tobacco.

Hull, situated immediately opposite Ottawa, shares with that city in the Chaudière water-power. The principal manufacturing establishments are lumber mills, paper mills, pulp mills, tub and pail factories, and match factories. The city also has a pork-packing business and extensive stone, lime, and cement works.

FIG. 107.
The city of Sherbrooke.

Sherbrooke, on the St. Francis River, is the chief town of the "Eastern Townships" (Fig. 107). It has good water-power, and manufactures woollens and machinery. The town also has a large local trade with the surrounding agricultural district.

Three Rivers, at the mouth of the St. Maurice, which here joins the St. Lawrence by three months, has a large lumber trade. Near by are the Radnor iron forges. Three Rivers was the first place in Canada to smelt iron. The town has also a large shoe factory.

St. Hyacinthe, on the Yamaska, is the seat of the Government experimental dairy school. It also has manufactures of paper, leather, boots and shoes, woollens, and agricultural machinery.

Levis is opposite Quebec city, with which it is now connected by means of a bridge across the St. Lawrence. The town has a large shipping trade.

Sorel is situated on Lake St. Peter, at the mouth of the Richelieu River on the site of an old fort, built in 1665. It has extensive factories for engines, mill machinery, stoves, ploughs, and leather. Some ship-building is done.

GOVERNMENT

Quebec is governed by a *Lieutenant-Governor* appointed by the Governor-General in Council, a *Legislative Council* of twenty-four members appointed for life by the government of the day, and a

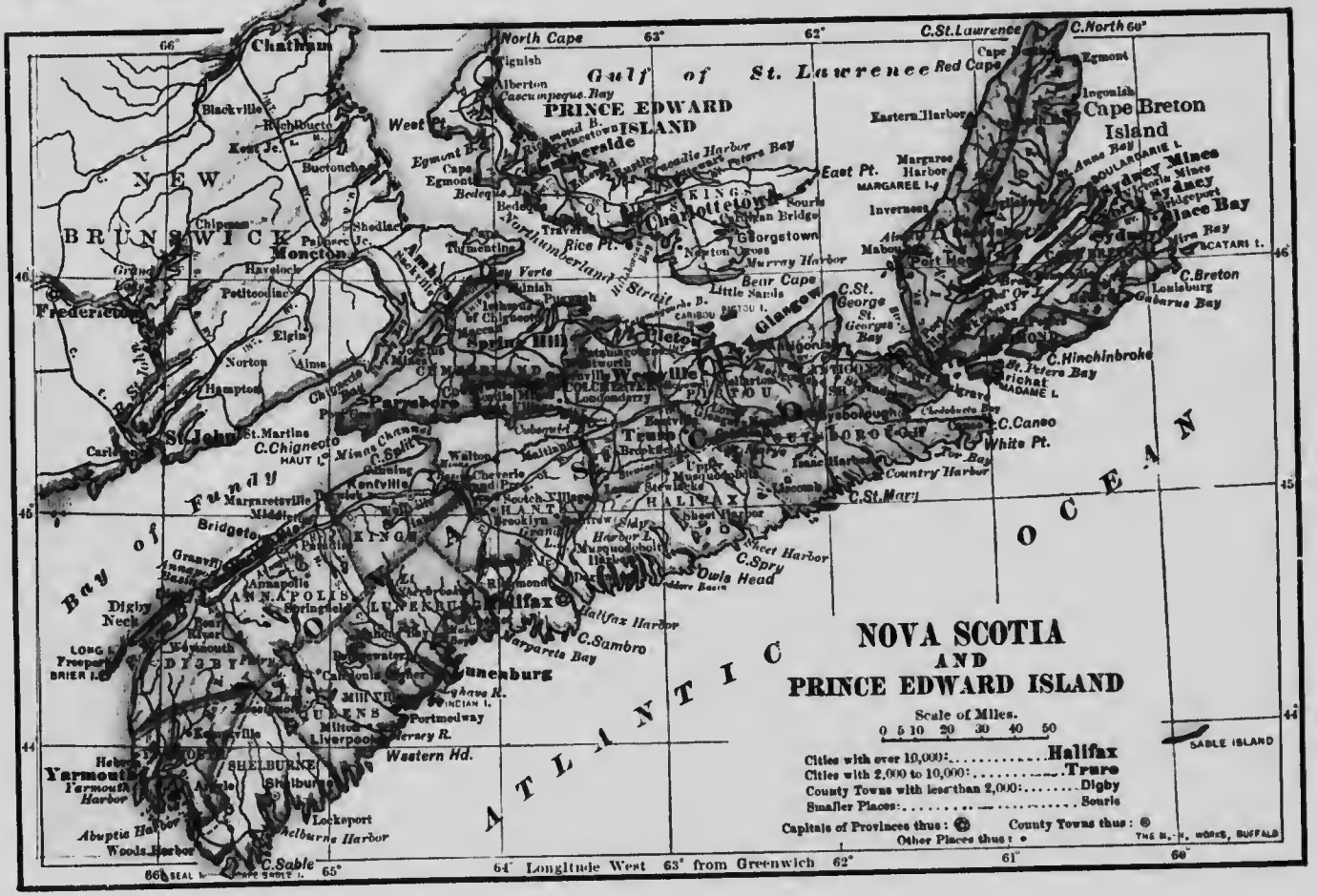


FIG. 108.

MAP QUESTIONS.—(1) Trace the boundaries of Nova Scotia and of Prince Edward Island. (2) Locate the highlands of Novia Scotia, naming the principal mountains. (3) Locate the principal rivers and lakes of the interior. Compare the length of the rivers in the various slopes. (4) Follow the coast-line of the two provinces, pointing out the capes and bays. Compare the coast-lines on the various sides of Nova Scotia. (5) Compare the surface of Cape Breton with that of the peninsula proper. Compare the surface of Prince Edward Island with that of Nova Scotia. (6) Locate the most important mining regions in Nova Scotia. Trace the lines of railway. (7) Point out the larger harbors in the two Provinces. (8) Name and locate the larger cities and towns. (9) Draw an outline map of each Province, with special attention to the coast-line. (10) From the map estimate the distance across Northumberland Strait at various points.

Legislative Assembly of seventy-three members, elected for a term of not more than five years by the people. The *Executive Council*, or *Cabinet*, of eight members is chosen from the party having the majority in the Legislative Assembly. Both the French and the English language are used in the debates in both houses. Quebec is represented in the House of Commons by sixty-five members and in the Senate by twenty-four members. There is a complete municipal system, the provinces being divided into parishes or townships for that purpose.

III. NOVA SCOTIA

Physiography and Coast-line. — The peninsula of Nova Scotia is divided into two parts almost equal in area by a ridge running through the whole length of the province. The one-half faces the Atlantic, and the other slopes toward the interior waters. The first half may be said to be rocky and barren, and the second for the most part fertile. The barren strip along the Atlantic coast is about twenty-one miles wide and interspersed with numerous lakes and streams. The country is a paradise for sportsmen, moose, caribou, and fur-bearing animals being plentiful, while the numberless lakes and streams are full of trout.

On the side facing the inner waters of the *Bay of Fundy* the country wears a different aspect. There continuous hills, clothed with beech, maple, and other hardwoods, run in ranges in the general direction of the coast-line, with an elevation of from five hundred to seven hundred feet.

Along the north shore of the Minas Basin are the *Cobequid Mountains*, which continue all along the northern half of the peninsula to the *Straits of Canso*. These mountains are nowhere higher than 1200 feet. The northern slope of this watershed is very fertile.

Around the *Basin of Minas* and *Chignecto Bay* are the fertile marsh lands formed by the tides which here range from thirty-eight to sixty feet in height and penetrate far up the numerous short rivers (Fig. 109). When the tide is out, the river channels are dry, and a view of an amazing area of mud flats covered with a red fertilizing slime is afforded. Then may be seen the remarkable spectacle of boats lying high and dry, which a few hours before were afloat in twenty or thirty feet of water.

The coast-line of Nova Scotia facing the Atlantic is in general low, but extremely rugged and rocky, and studded with many islands. It abounds with excellent harbors, many of them capable of receiving the largest vessels afloat. Of these Halifax Harbor is the best known, but Lunenburg, Shelburne, and Canso are almost equally good. The coast on the Bay of Fundy is less rugged, and contains few harbors, those of Annapolis and Digby being the best.

Annapolis Basin is an arm of the sea, of great beauty, rendered historic by being the scene of the settlement in 1605 of de Monts

Fig. 109.

Diked lands at Grand Pré on the Avon River, the home of "Evangeline."

and Champlain. It is five miles wide, bordered by a high rocky ridge, *North Mountain*, which forms an admirable protection from the north winds.

Farther up the Bay of Fundy the Basin of Minas opens up, marked on its southern shore by two grand headlands, *Cape Split* and *Cape Blomidon*. This beautiful sheet of water extends sixty miles into the land, with an extreme breadth of twenty miles. All along its northern shore runs the range of the Cobequid Mountains, clothed to their summits with beech and maple. On the southern shore are the rich diked lands of Grand Pré, made famous by Longfellow's poem of "Evangeline." Near here is the mouth of the *Avon*, a river up which a tidal wave, thirty-eight feet high, sweeps far into the country.

The Bay of Fundy is noted for its tides, which are higher than in any other part of the world. This is due to its funnel shape, the tide increasing in height as the bay becomes narrower. In Digby and St. John the extreme height of the tides does not exceed twenty-seven feet, while near Truro and Hillsborough the rise and fall of the tide is fully sixty feet.

The upper extremity of the Bay of Fundy is known as *Chignecto Channel*, which forks into two bays, *Chepody Bay* in New Brunswick, and *Cumberland Basin* washing the coast of Nova Scotia. The Chignecto isthmus is narrowest at the head of this bay, but the prodigious tides render impossible the construction of a canal to connect with Northumberland Strait.

The north coast of Nova Scotia, on *Northumberland Strait*, consists of a low shore, deeply indented by a number of good harbors, as Pugwash and Wallace, but the finest harbor is Pictou. Here the largest vessels resort to ship coal from the adjacent coal mines. At the eastern end of the peninsula are two large bays, *Chedabucto* and *St. George's*, connected by the Strait of Canso, a deep lane of water between the peninsula of Nova Scotia and Cape Breton. It is 14 miles long, ¾ of a mile wide, and nowhere less than 90 feet deep. Both its shores are bold, and the scenery exceedingly beautiful. The island of Cape Breton is very irregular, both in surface and coast-line. In many places the ocean reaches into the heart of the island.

Sable Island, about 200 miles from Halifax, is a low-lying, sandy island, very dangerous to navigation. A wireless telegraphy station has recently been erected there.

Climate

The climate of Nova Scotia partakes of the general characteristics of the eastern coast of North America, but it is more temperate than that of the adjoining mainland in consequence of being surrounded by water. No part of the province is more than thirty miles from the sea, hence the climate is moist and the rainfall abundant. The winter begins in December and lasts until March, and the mean temperature of that season is 23 degrees. The summers are hot and vegetation is rapid, the mean temperature being 61 degrees.

Maize, a crop requiring a high summer temperature with abundant sunlight, is grown successfully in the interior. The autumn lingers long and is the most delightful season of the year. The climate is very favorable to health, and the inhabitants are long-lived. In the southern portion of the province the winters are milder and the snowfall is less. There sheep are pastured out all winter.

The greatest drawback to the coast is the fog, generated by the Gulf Stream, which often in summer sweeps in from the sea, along the Atlantic coast and the shores of the Bay of Fundy. It never extends more than a few miles inland.

Fishing

Fig. 110.
Herring Cove, a fishing village near Halifax.

Living within the sound of the sea and near a coast indented with many good harbors, Nova Scotians naturally turn to the ocean for one means of subsistence. The fisheries, therefore, especially of cod and lobsters, form one of the most important industries of the province.

Four centuries ago Basque and French fishermen cast their lines in these waters. At the present time the fisheries of the province employ upward of 17,000 boats and give employment to fully 30,000 men. The annual value exceeds $7,000,000. Many of the fishing vessels are of large size, ranging as high as 80 tons. **Cod** and **lobsters** constitute about two-thirds of the catch, but **mackerel**, **herring**, **haddock**, **halibut**, and **salmon** are also taken in large numbers. The fish caught are exported to Great Britain, the United States, the British West Indies, Brazil, Cuba, Germany, Italy, and other countries. Along the shores there are over 250 lobster canneries

Fig. 111.
Harbor of Lunenburg, showing fleet of fishing vessels. These are all engaged in the deep-sea fishery.

that ship their products to the coast cities of the United States and to various European markets. Besides the canned product, great numbers of these fish are also exported alive in tanks. **Clams** found along the coast live buried in the mud flats, which are exposed to view at low tide. At such times boys and men dig these shell-fish out much as a farmer digs potatoes from a hill.

Mining

Minerals. — Nova Scotia abounds in valuable minerals, and these must always prove one of its principal sources of wealth. It is the only province in the Dominion where coal, iron, and gold are found near together. These, combined with her large timber areas and unlimited water-power, provide the most favorable conditions possible for manufactures. The chief minerals mined are *coal*, *iron*, *gold*, and *gypsum*. Deposits of *manganese*, *copper*, *antimony*, and *lead* also exist and are worked to some extent.

The province abounds in excellent building stone. The freestone of Wallace on the north coast has long been noted for its excellence and has been used in many fine buildings.

Coal. — The Nova Scotia coal is all bituminous, or soft, and is of excellent quality both for domestic and steam purposes. The output, which has doubled in ten years, was 5,000,000 tons in 1904. Of this Quebec took about one-third.

There are three large coal fields in the province: Cumberland, Pictou, and Sydney, with a combined area of 700 square miles.

The Cumberland field has an area of 430 squares miles, the chief mines being at Springhill and Joggins. From the former the Intercolonial obtains its supply; at the latter is seen the most remarkable example in the world of fossil forests of the carboniferous age. The fossil tree trunks have been turned to coal, while the roots are buried in the rocks below. The action of the tide exposes new fossil trees from year to year. The Pictou coal-field has an area of only 35 square miles, but the aggregate thickness of the seams is over 100 feet. New Glasgow is the chief mining centre, while Pictou is the shipping port. From this port a cargo has recently been shipped to Norway in competition with the Scottish and Welsh collieries. The Sydney coal-field in Cape Breton extends along the Atlantic shore for 32 miles, and covers an area of 250 square miles. The largest mines are at Glace Bay, 18 miles from Sydney. A newer coal-field is that on the western shore of Cape Breton Island, in the vicinity of Inverness and Mabou.

When the coal seam crops out in a valley, it is quarried from the seam in much the same way as stone is quarried from a hillside; but when

the coal lies far below the surface, shafts have to be sunk to it. From the sides of such a shaft, tunnels are dug into the beds, and from these the coal is removed. Usually there are several beds of coal with thick layers of rock between them, and the shaft extends downward through them all, with tunnels reaching out from it at each level of the mineral.

The workmen break the coal with the aid of steam drills and picks. After the coal is broken loose, it is placed in small cars drawn to the shaft by horses or by electricity, and then hoisted to the surface by steam. The horses are kept underground for months, being fed and allowed to sleep in stables cut out of solid coal. The miners are now largely foreigners, and in a single mine one may hear several different languages spoken.

Iron. — Valuable iron ores are found in many places in Nova Scotia and the Island of Cape Breton. These minerals exist in large quantities in the coal districts, and the manufacture of iron and steel is carried on in NEW GLASGOW, in LONDONDERRY, and in SYDNEY (Fig. 112). Many of the Nova Scotia ores are of high quality, and this industry gives promise of attaining immense proportions in the near future. The new iron and steel works at Sydney, and at Sydney Mines, on the opposite side of the harbor, have absorbed an immense amount of capital, and give employment to many hundreds of men.

FIG. 112.

The outside of a blast furnace at Sydney, Cape Breton. The round towers are the furnaces; the tall, slender towers the chimneys. The ore, coal, and limestone are elevated, and then carried on cars over the tracks ruuning to the top of the furnaces.

Gold. — Gold mining has been carried on in Nova Scotia for upwards of forty years. Gold has been found in the quartz rocks in thirty-five different places. The metal is extracted from the quartz by means of stamping mills, and the business, although on a small scale, yields good profit. Over $17,000,000 worth of gold has been obtained so far from the rocks of Nova Scotia.

Gypsum. — Gypsum is found in very large quantities in many parts of the province. The largest deposits are in the Island of Cape Breton and in the region of the Basin of Minas. The annual product is 100,000 tons, most of which is exported to the United States.

Gypsum in the raw state is used as a fertilizer. When heated in kilns to drive off the water it is known as *plaster of Paris*, so called because the preparation of it centred originally around several Parisian suburbs. It is used in the arts to obtain copies of statuary, and for inside plaster work in houses. Imitation marble can also be made from it. *Stucco* is plaster of Paris mixed with a strong solution of glue.

Agriculture

Nova Scotia contains a large area of excellent land, and farming operations are carried on to a greater or less extent by residents of all of its rural districts. The diked lands of the province, commonly called "marshes," are of inexhaustible fertility, and have been producing crops for more than two centuries. Much of the upland, especially that along the Gulf shore, is of excellent quality, and there are large areas of intervale land on all the streams. All the fruits, vegetables, and cereals of the temperate zone grow in Nova Scotia. Fruit growing, especially the cultivation of apples, is extensively carried on in the Annapolis Valley, about half a million barrels being exported annually, chiefly to Great Britain, from this district alone. (Fig. 113.) Peaches, plums, cherries, strawberries, and tomatoes give large yields with little attention. Considerable quantities of these are regularly shipped to New York, Boston, and other cities on the United States seaboard.

Fig. 113.
Apple orchard in the Annapolis Valley.

The leading crops of the farm are hay, oats, buckwheat, potatoes, and turnips. Wheat is not cultivated to any great extent. Stock raising and dairying are of growing importance.

Lumbering

About one-third of the area of Nova Scotia is still covered with forest. The prevailing woods are spruce, fir, hackmatack or black larch, hemlock, birch, beech, maple, and ash. Formerly the white pine was very abundant, but it has mostly disappeared, owing to

improvident cutting. There is still an abundance of spruce, and the export of spruce deals now forms a large item in the commerce of the province.

Before the advent of iron and steel ships a great deal of shipbuilding was done in Nova Scotia. Yarmouth, Hantsport, Windsor, and other places every year built many fine vessels, which carried the fame of the province all over the world. This business has been destroyed in consequence of the competition of steamers and steel ships, and the shipbuilding of the province has fallen to small proportions, being confined to schooners and other small vessels for the coasting trade. Even yet, however, vessels from Halifax and Yarmouth may be met with in every great seaport in the world.

Manufacturing

The principal manufacturing industry of Nova Scotia is the making of iron and steel, which are produced at Sydney, Cape Breton. Two companies are operating in that vicinity, and iron and steel are

Fig. 114.
View of the iron and steel works near New Glasgow.

being exported from the province as a result of their efforts. There are also iron works at Ferrona and at Londonderry, near Truro, and steel plants at New Glasgow. (Fig. 114.) There is little doubt that the manufacture of iron and steel will become in time the leading industry of the province, in consequence of the ore and the coal being found near each other. The other manufacturing industries of the province include wood-working, the making of boots and shoes, sugar refining, the manufacture of ropes and twines, biscuits, carriages, cottons, woollens, grindstones, and agricultural implements. There are extensive car works at Amherst.

Transportation

Nova Scotia has upward of 1000 miles of railway, the principal line being the Intercolonial, which connects Halifax and Sydney with Quebec and Montreal. The Dominion Atlantic is the next in

importance, and connects Halifax with Annapolis and Yarmouth. All the principal towns in the province now have railway communication. Lines of steamships run from Halifax to the West Indies and also to the United Kingdom and the United States. There is an excellent steamship service between Digby and St. John, Pictou and Charlottetown, Sydney and St. John's, Yarmouth and Boston, and between the Atlantic ports of Nova Scotia.

FIG. 115.
The dry dock at Halifax.

SUMMER RESORTS

Nova Scotia is justly famous as a resort for tourists, not only on account of its invigorating climate and its scenic grandeur, but by reason of its many thrilling historical associations. It is a land of waters, and affords the most varied means of recreation, such as boating, yachting, bathing, fishing, and hunting, besides the many charming excursions by water or rail, to its many points of interest.

The most attractive region in Nova Scotia is undoubtedly Evangeline's Land, on the south shore of the restless Basin of Minas, in which the chief places of interest from the tourist's standpoint are WOLFVILLE and GRAND PRÉ, while farther up the basin is KINGSPORT, famous for its shipbuilding. Just opposite, on the north shore, is the beautiful town of PARRSBORO, near which is SOUTH JOGGINS, with its exposed fossil forests, interesting not alone to the geologist but to the general tourist as well.

DIGBY, opposite DIGBY GUT, on Annapolis Basin, famous for cherries and herring, is a busy place during the tourist season, and has steamboat connection with St. John. Farther up the basin is ANNAPOLIS, ancient,

yet beautiful. At the head of navigation, on the Annapolis River, is BRIDGETOWN. Twenty-one miles south of Sydney is the historic LOUISBURG, with its ruined fort.

BRIDGEWATER, on the beautiful La Have River, thirteen miles from its mouth, CHESTER, on Mahone Bay, noted for its lobsters, WEYMOUTH, on Ste. Mary's Bay, MIDDLETON, LAWRENCETOWN, KENTVILLE, and COLDBROOK, and many others, are growing in favor as summer resorts. Find these on the map.

For the sportsman Nova Scotia offers many attractions. The forests of the interior are full of game and are easily reached. The chief sporting regions of the province are: the Tusket region, accessible from Yarmouth; the Annapolis region; the Gaspereau region, easily reached from Wolfville; the Cumberland region, reached from Parrsboro or Kingsport; the Halifax region, and the Cape Breton region.

CITIES AND TOWNS

HALIFAX, the largest city, is the capital and the business centre of the province. Fully one-half of the exports and imports of the province pass through the city. Halifax was formerly the chief British naval station for North America and is very strongly fortified. A garrison of Canadian troops is maintained there at the expense of the Dominion government. The harbor, which is free from ice all the year round, is one of the finest havens in the world; it is fourteen miles long, with nowhere less than forty feet of water. The city has a beautiful situation and is solidly built. The Provincial Government Buildings are situated here, as are also Dalhousie University and the Institutions for the Blind and for the Deaf and Dumb. DARTMOUTH is prettily situated on Halifax harbor opposite the capital city.

SYDNEY, in Cape Breton, has risen to importance recently in consequence of the establishment there of extensive steel works. Immense deposits of coal exist in its vicinity. On the opposite side of its very commodious harbor is NORTH SYDNEY, a very important shipping port.

YARMOUTH is a progressive town at the entrance of the Bay of Fundy. Formerly it was a great shipbuilding centre and devoted exclusively to maritime pursuits. With little back country to support the town, the people yet thrive by shipbuilding and the carrying trade. The lakes in the rear are beautiful, and the region is a sportsman's resort.

TRURO lies at the head of the Basin of Minas and is the centre of a wealthy agricultural district. The provincial Normal School is situated

here. NEW GLASGOW is the centre of a large iron and coal industry. SPRINGHILL has risen into importance in consequence of the coal mines in its vicinity. WINDSOR, on the Avon, is a shipping port, has important manufactures, and is the seat of King's College, founded in 1790. A fleet of large ships is kept busy carrying the gypsum mined near by to New York and Philadelphia. When the tide is in, Windsor harbor is capacious, but when it is out the ships are left high and dry. AMHERST is a manufacturing town in the centre of a rich agricultural district, and within a few miles of the Cumberland coal-fields. PICTOU, with a splendid harbor, is the shipping port for New Glasgow and other coal mines. LUNENBURG is engaged largely in the fishing and lumbering industry, and has a large trade with the West Indies. ANTIGONISH, a thriving town, whose inhabitants are nearly all highland Scottish, exports cattle, butter, and other farm products. It is the seat of St. Francis Xavier College. MULGRAVE, on Canso Strait, has a railway-ferry to Cape Breton. LOUISBURG, CANSO, and PARRSBORO are important seaport towns. GLACE BAY and SYDNEY MINES in Cape Breton, and WESTVILLE and STELLARTON in Pictou county, owe their prosperity to the coal mines in their vicinities. WOLFVILLE is the seat of Acadia University. ANNAPOLIS, formerly Port Royal, is interesting as the oldest town in the province.

GOVERNMENT

The government of Nova Scotia consists of a *Lieutenant-governor*, appointed by the Dominion Government, a *Legislative Council* of twenty members, appointed for life by the government of the day, and a *Legislative Assembly* of thirty-eight members, elected by the people. The *Cabinet* or *Executive Council* consists of eight members, and must be able to obtain the support of a majority in the popular chamber. Nova Scotia is represented in the House of Commons by eighteen members and in the Senate by ten members.

FIG. 116.
Provincial Government Buildings, Halifax.

Every division sending a representative to the provincial Legislative Assembly is a municipality possessing local self-government.

IV. NEW BRUNSWICK

Physiography and Coast Line. — New Brunswick resembles in its topographical features the adjoining portions of Quebec and New England. It is a rolling country of no great elevation, and its loftiest hills do not exceed 2800 feet in height. The highest hills are in the northern and northwestern sections of the province, and are an extension of the Appalachian system. The scenery is picturesque and varied, and a large portion of the centre of the province consists of one vast forest. The general level is low, and a very considerable portion of the province does not rise more than 200 feet above sea level. The coast along the Bay of Fundy is not high, but it is rocky and bold. On the Bay of Chaleur and the Gulf of St. Lawrence the shore is less rugged. The Bay of Chaleur itself is without a rock, reef, or shoal to hinder navigation.

Few countries are so well watered as New Brunswick. Lakes are numerous and there are many rivers and streams, some of them of large size. The *St. John River*, which rises in the state of Maine, is about 450 miles in length, and empties into the Bay of Fundy. For 80 miles of its course, the St. John forms the boundary between Canada and the United States. At Grand Falls, 225 miles from its mouth, the river leaps over a precipice of 58 feet into an immense chasm, forming a cataract of great beauty. The river is navigable from this point to its mouth. At the head of St. John harbor occurs the famous "reversible falls," caused by the narrowing of the river as it passes between walls of rock 100 feet high, and by the rapidity of the tide, which here reaches a height of 25 feet. The upper course of the river passes through a dense forest country, so that the river is of great use to the lumbermen in floating logs to the mills. For the greater part of its lower course it passes through a rich agricultural country. The *St. Croix River*, which forms part of the western boundary of the province, flows into the Bay of Fundy, and is navigable up to about 25 miles from its mouth. The *Miramichi River*, about 220 miles in length, flows into the Gulf of St. Lawrence. The river has two branches, which unite near its mouth. With its tributaries the Miramichi drains a large portion of the interior of the province. The river is navigable for large vessels as far as Newcastle and Chatham. It is important for its large lumbering trade and for its fisheries. The *Restigouche River*, which flows into the Bay of Chaleur, is 225 miles in length and for a portion of its course is the boundary between New Brunswick and Quebec. It is navigable for the largest vessels as far up as Campbellton. The river is noted for the beautiful scenery along its banks and for its salmon. The *Petitcodiac*, *D'Aulac*, and *Tantramar* are but small streams when the tide

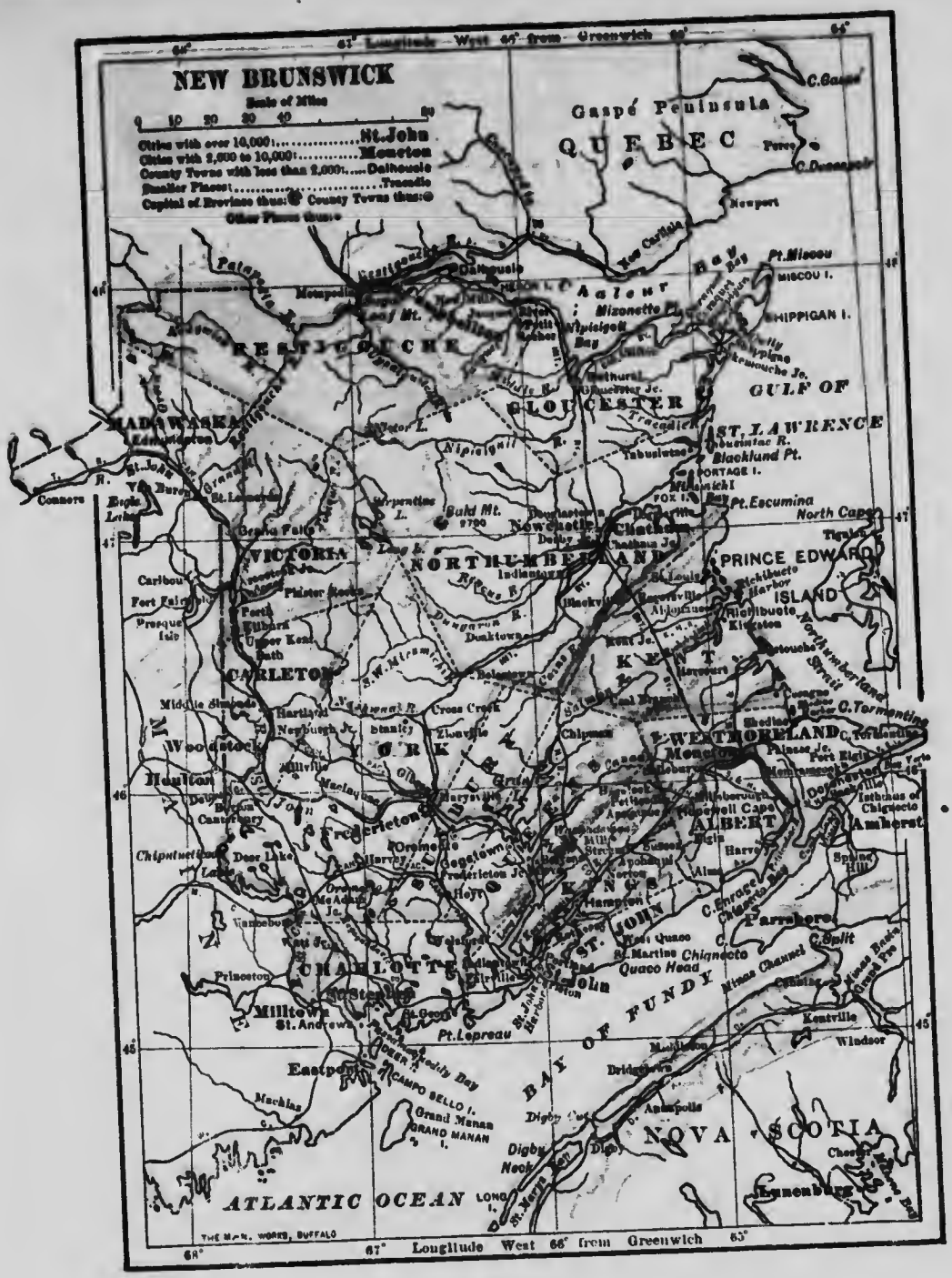


FIG. 117.

MAP QUESTIONS.—(1) Trace the boundaries of New Brunswick. (2) Draw an outline map of the Province, locating the highlands and rivers and the bays on the coast. (3) Trace the course of the principal rivers. (4) Compare the rivers that flow into the Gulf of St. Lawrence with those that empty into the Bay of Fundy. (5) Locate the larger lakes of the interior and point out the principal islands, bays, and capes on the coast. (6) Compare the eastern with the southern coast. (7) Locate the mineral regions. (8) Trace the lines of railway, pointing out their relations to the mining districts and naming the principal places on each line. (9) Name and locate the larger cities and towns of the Province. (10) Trace the coast-line surrounding the Bay of Fundy.

is out, but when the tide from the Bay of Fundy rushes in they become broad rivers. The rivers of New Brunswick are an important element in the prosperity of the country. For the most part they extend far inland and have good harbors at their mouths. The interior of the country is thus brought into close communication with the ocean and with ocean navigation.

The Islands of *Campobello* and *Grand Manan*, at the entrance of the Bay of Fundy, belong to New Brunswick. These are small islands, but of importance as centres of the fishing industry and as resorts for tourists. *Miscou* and *Shippegan* Islands at the entrance to the Bay of Chaleur have good harbors.

Climate

The climate of New Brunswick is similar to that of Quebec and Maine. The winters are severe, and in summer a high temperature prevails, but the climate is healthy. In the interior the thermometer sometimes registers 90° Fahr. Winter begins early in December and lasts until the end of March. Along the shore of the Bay of Fundy the climate is less extreme, but here fogs are of frequent occurrence. The most charming season is the autumn, which lingers long. The cold weather does not become established until well on in November. The average rainfall is thirty inches, and the average snowfall is eighty-eight inches.

Agriculture

One of the leading industries of New Brunswick is agriculture, the greater number of the people being farmers. The province contains about 14,000,000 acres of arable land, a very large part of which has not yet been cultivated. Of the portion now under cultivation, the marshes at the head of the Bay of Fundy, the intervales of the St. John and other large rivers, and the uplands of the

Fig. 118.
Apple trees in blossom, Keswick Ridge, N.B.

northern portion of the province are very fertile. Wheat is grown successfully but not in sufficient quantities to supply the needs of the province. The largest crops are oats, potatoes, turnips, and buckwheat, all of which grow well. Maize, used for feeding purposes, is extensively grown in the interior of the province. Apples form an abundant crop in some sections. (Fig. 118.) A great deal of attention is now being given to dairying. There are numerous cheese factories and creameries in the province which manufacture cheese and butter for export to England and other countries.

Lumbering

The larger portion of the province is still covered by forests, and lumbering is after agriculture the principal industry. The forest trees of New Brunswick consist of pine, spruce, fir, cedar, maple, oak, hemlock, butternut, birch, beech, ash, elm, and numerous other species of trees. Spruce is at present the principal commercial wood, and is cut into deals and exported in immense quantities to Great Britain. Lumber mills are scattered at important points all over the province. (Fig. 119.)

Fig. 119.
A log boom at Marysville.

Shipbuilding was formerly a very important industry in New Brunswick, and large numbers of splendid vessels were launched from its shipyards every year. As in Nova Scotia, this business has almost disappeared in consequence of steel ships and steamships taking the place of wooden vessels. The decline of shipbuilding had a very serious effect on the prosperity of the province.

Mining

New Brunswick is inferior to Nova Scotia in respect to mineral wealth, but it possesses some valuable ores, and abounds in excellent building-stone. **Coal** is found in the southern portion of the province

at many points, and is being worked at Grand Lake and in two or three places in the county of Kent. The seams are thin but close to the surface, and easily reached. **Albertite**, a valuable bitumen, is found in the county of Albert, and, in the same vicinity, **petroleum**. Wells of the latter are being operated in Westmoreland. **Iron** is found in many portions of the province, and has been worked extensively in the county of Carleton. **Copper ore** exists in large quantities, and is now being worked in Westmoreland County. Deposits of **nickel**, **antimony**, **galena**, **manganese**, and **graphite** also exist.

New Brunswick is abundantly supplied with **limestone**, the most valuable deposit being in the county of St. John. **Gypsum** is found in large quantities, and is extensively quarried in the county of Albert. There are large quarries of **granite** in various parts of New Brunswick, at Hampstead, in the Nerepis Valley, and near St. George in the county of Charlotte. **Marble** is also found in some localities. **Freestone**, suitable for building purposes and for the manufacture of grindstones and millstones, is also found in many parts of the province. **Slate** is abundant, and there is clay for the manufacture of bricks in most of the counties. Saline and other mineral springs are numerous, the principal ones being in the county of Kings.

Fishing

New Brunswick possesses a coast-line on the Bay of Fundy, Gulf of St. Lawrence, and Bay of Chaleur of upward of 600 miles, and these waters abound in fish. Although less extensive than the fisheries of Nova Scotia, those of New Brunswick are very valuable, the average product being over $3,000,000 a year. The two greatest fishing counties are Charlotte and Gloucester. The largest catch is that of **herring**, of which upwards of a million dollars' worth are taken every year. **Lobsters**, **sardines**, **smelt**, **codfish**, **salmon**, **haddock**, and **oysters** (Fig. 120) come next in order.

Fig. 120.

Fleet of oyster boats off Caraquet, on the Bay of Chaleurs.

Upwards of $2,000,000 is invested in the fisheries, and nearly 300 vessels and 7000 boats, manned by 12,000 men, are engaged in the industry in the fisheries, in addition to about 3000 employed in the canneries.

Manufacturing

The greatest manufacturing industry in New Brunswick is the conversion of the lumber of the province into deals, boards, clapboards, shingles, and similar articles. This industry employs hundreds of saw-mills and gives employment to many thousands of men. The province contains four pulp mills for the making of chemical pulp. There are five cotton factories in New Brunswick and several iron foundries. The manufacture of nails is carried on extensively. There are many tanneries, and boots and shoes are made in a number of places. Paper boxes, wools, grindstones, candy, and soap are also extensively manufactured. There are also a few furniture factories and carriage factories. The canning of lobsters is an important industry.

Transportation

New Brunswick contains about 1500 miles of railway, the principal lines being the Intercolonial and the Canadian Pacific. Moncton is the centre of the Intercolonial Railway system and that line connects St. John, Fredericton, Chatham, and other important New Brunswick towns with Quebec and Montreal. The Canadian Pacific Railway has its Atlantic terminus at St. John, and it connects that city as well as Fredericton, Woodstock, St. Andrews, and St. Stephen with Moncton and the West. A large portion of the winter traffic of Canada passes over its road through New Brunswick to the port of St. John, where there are deep-water wharves and elevators. Steamboats for local trade ply on all the principal rivers.

Cities and Towns

St. John, the largest city and the business centre of the province, is situated at the mouth of the river of the same name. The harbor is a very fine one, open all the year round, and, owing to the very high tide, entirely free of ice in winter (Fig. 121). Regular lines of steamships connect the city with Great Britain, the West Indies, the coast cities of the United States, and with the ports on the Bay of Fundy. The extension of the "short line" of the Canadian Pacific from Montreal has greatly increased the business of the city as a winter port. It has also railway communication with Montreal, Quebec, and Nova Scotia by means of the Intercolonial Railway. In addition to its importance as a distributing centre, St. John has

many large and growing manufacturing establishments. The principal manufactures are lumber, heavy machinery of all kinds, cottons, woollens, pulpwood and paper, and leather goods. The city is substantially built and has many fine buildings, including the Custom House, Post Office, and the Provincial Asylum for the Insane.

Fig. 121.

The harbor of St. John.

Fredericton, the capital of the province, is beautifully situated on the right bank of the St. John, about eighty-four miles from its mouth. It is connected by rail and water with the most important centres in the province. The city is in the midst of an important agricultural district and is the seat of a great lumbering industry. The provincial Government Buildings are located here, as are also the University of New Brunswick, the Normal School, and the Infantry School.

Fig. 122.

Tidal bore at Moncton. Here the tide rushes in at the rate of six or seven miles an hour.

Moncton, the headquarters of the Intercolonial Railway, is situated on the Petitcodiac River. It is an important manufacturing centre, the principal manufactures being sugar, flour, cottons, woollens, and iron goods. At Moncton may be seen the great "Bore" or tidal wave, which rushes up the river when the tide is coming in from the Bay of Fundy (Fig. 122).

Chatham, on the Miramichi River, has an excellent harbor, and is an important port for the shipment of lumber to Europe. It has also a number of manufacturing establishments. St. Stephen, on the St. Croix River, has a large lumber trade and cotton and candy factories. St. Andrews, at the mouth of the St. Croix, is engaged principally in the fisheries and the lumber trade, and is also a popular summer resort. Woodstock is the centre of a rich agricultural country and has large woollen and lumber mills. Newcastle, on the Miramichi, has an important lumber trade. Marysville has a large lumber trade and cotton mills. Richibucto, at the mouth of the Richibucto River, has large lumbering and fishing interests and is noted for its lobster canneries. Dalhousie, at the head of the Bay of Chaleur, has a fine harbor, and is the shipping point for the lumber floated down the Restigouche River. Sackville, the seat of Mount Allison University, Memramcook, the seat of St. Joseph's College, and Dorchester, where is situated the Penitentiary, are important places. Other towns are Campbellton, Bathurst, Edmunston, and Hillsboro.

Summer Resorts and Sporting

New Brunswick is much resorted to by sportsmen, as it abounds in fish and game. The interior of the country is a network of streams, affording easy access by means of canoe and paddle. It possesses some of the finest salmon rivers in the world, and trout also abound in most of its rivers and streams. In its forests, moose, caribou, and deer are found in large numbers, as are foxes, mink, and muskrats. Excellent game laws are in force, and as these are strictly carried out, the game is increasing rather than disappearing. Wild fowl of all kinds are plentiful, and every year it is becoming more famous as a centre of sport. Hunters' lodges may be found dotted all over the northern part of the province.

Fig. 123.

Provincial Government Buildings, Fredericton.

In addition to those who visit New Brunswick for the sake of the sport, many tourists summer in the province in various parts. The

northern fishing streams are favorite spots, but the Bay of Fundy ports are not neglected. Grand Manan and Campobello Islands have already been named as the summer home of wealthy tourists from a distance.

Government

New Brunswick is governed by a *Lieutenant-Governor* appointed by the Dominion Government, and by a *Legislative Assembly*, of forty-six members, elected by the people. The *Executive Council* consists of seven members and is responsible to the Assembly (Fig. 123). The province has thirteen members in the House of Commons and ten in the Senate. There is a complete system of municipal government.

V. PRINCE EDWARD ISLAND

Physiography. — Prince Edward Island is 145 miles in length, and varies in width from five to thirty miles. Its outline is irregular, as it is penetrated by deep bays forming harbors on both its northern and southern sides. The surface is generally level or rolling, the highest land upon the island not being more than 500 feet above the level of the sea. The rock is red sandstone. No coal has been discovered on the island, but it is believed that beds of it exist, although at a great depth below the surface.

Climate. — The climate of Prince Edward Island is somewhat milder than that of the adjoining coasts of New Brunswick and Nova Scotia, but it partakes of the same general characteristics. The spring is retarded by the influence of the Labrador current, but the autumn is more protracted than in the adjoining portions of Canada. In the winter the island is cut off from the mainland by the ice, which sometimes freezes solid from shore to shore, and it has been proposed to construct a tunnel across the Straits of Northumberland to get rid of this difficulty.

Fig. 124.
Farming scene in Prince Edward Island.

Agriculture. — The soil of the island is an open sandy loam of a deep red color and admirably suited to the production of crops,

especially of oats and potatoes. Maize and barley are also extensively grown (Fig. 124). Nearly the whole of the island has been cleared of its forests and is under cultivation. Much attention has recently been paid to dairying and to stock-raising. There is a condensed milk factory at Charlottetown (Fig. 127). The agricultural exports of the island are large and principally go to Great Britain.

Fig. 125.
Fishing boats at Summerside.

Fishing. — The waters surrounding the island are among the finest in the world and abound in **codfish, mackerel, lobsters, herring, gaspereau**, and other valuable fish (Fig. 125). Many of the inhabitants of the island are engaged in the fisheries. The annual product averages a million dollars. Prince Edward Island is noted for its oysters, the famous Malpeque **oyster** finding its home here.

Fig. 126.
The ice-breaking steamship *Stanley*, crushing its way over Northumberland Strait.

Transportation. — During the season of navigation there is daily communication by steamer between Summerside and Point du Chene, New Brunswick, and Charlottetown and Pictou, Nova

Scotia. A railway, owned and operated by the Dominion Government, runs from one end of the Island to the other and has a number of branch lines.

After the close of open navigation, communication is maintained between Georgetown and Pictou, and between Summerside and Cape Tormentine, by the specially built ice-breaking steamers *Minto* and *Stanley* (Fig. 126). In midwinter the work of the steamers is supplemented by the ice-boat services between Cape Tormentine on the New Brunswick shore and Cape Traverse, a distance of about nine miles. The standard ice-boat is about eighteen feet long, five feet wide, and two feet two inches deep. Its frame is oaken, it is planked with cedar, and the planks are covered with tin. It has a double keel which serves for runners, and four leather straps are attached to each side. The crews are hardy, powerful, and courageous men. The passage usually occupies three and a half hours, but when there is much "lolly" — small particles of ice floating in the water often to the depth of several feet — and when wind and tide are unfavorable, it sometimes requires from five to seven hours. A trip by "the Capes" is a unique experience. Telegraphic communication is maintained by cable between Cape Traverse and Cape Tormentine.

Summer Resorts. — Prince Edward Island is fast rising into favor as a seaside resort. On the north coast the wide bays which penetrate into the land are cut off from open water by long narrow sandbanks with occasional openings through which small vessels may pass. These sandy beaches are favorite resorts for bathing in summer, for they are smooth and the water deepens very gradually. Among these the most popular are: ST. PETER'S BAY, TRACADIE BAY, RUSTICO BAY, RICHMOND or MALPEQUE BAY, famous for its oysters, and CASCUMPEC BAY. Tourists in large numbers come here every summer to enjoy the sea-bathing and breathe the invigorating sea air.

FIG. 127.
Condensed milk factory at Charlottetown.

Cities and Towns. — There are few large cities or towns in Prince Edward Island. CHARLOTTETOWN, the capital city, is beauti-

fully situated at the confluence of three arms of the sea and possesses a fine harbor. It has a thriving trade, and excellent steamship connection. The city is well planned, with every modern improvement but an electric railway. One of the healthiest cities in Canada, it is yearly becoming more esteemed as a place of residence. The excellence of its drinking water is proverbial, and its park, public gardens, and squares are attractive breathing spaces. Within a few minutes' trip by ferry, opposite the city, is a spot of great historic interest, where remains of the French occupation may be seen and where the air of romance still hovers. SUMMERSIDE has a large trade with New Brunswick, and is the centre of the oyster industry. It possesses a fine harbor. Other important towns are SOURIS, GEORGETOWN, and ALBERTON.

FIG. 128.
Provincial Government Buildings, Charlottetown.

Government.— Prince Edward Island is governed by a *Lieutenant-Governor* appointed by the Dominion Government, and a *Legislative Assembly* of thirty members, half elected by property owners only, and half elected on a franchise in which practically every man over twenty-one has a vote. The *Executive Council*, or *Cabinet*, consists of eight members, and is responsible to the assembly (Fig. 128). The Island is represented in the House of Commons by four members, and in the Senate by four members. There are no municipal institutions for local government.

VI. BRITISH COLUMBIA

Physiography. — British Columbia is a country of mountains, valleys, and elevated plains. Here the great Cordilleran system makes its grandest display. Belonging to this system are four well-defined parallel ranges. On its eastern border is the highest range of all, the Rocky Mountains, with an average width of about sixty

Fig. 129.

Map Questions.—(1) Trace the boundaries of British Columbia. (2) Draw an outline map of the Province, locating the various mountain ranges. (3) Trace the course of the rivers, showing clearly their relation to the mountain ranges. (4) Locate the larger lakes, showing clearly the importance of each in inland navigation. (5) Draw a map of the coast-line of the mainland and of Vancouver Island, locating the principal bays and islands. (6) Locate definitely the most important mining districts, showing the relation of each to the navigable rivers and the lines of railway. (7) Trace the lines of railway. (8) Name and locate the cities and towns of the Province, accounting for the position of each. (9) Trace the overland route to Dawson City. (10) Trace the coast-line of Alaska that lies between the northern part of British Columbia and the Pacific Ocean.

miles and a height of 8000 feet. Many of its peaks have a much greater elevation, the highest being Mt. Murchison, 13,500 feet high.

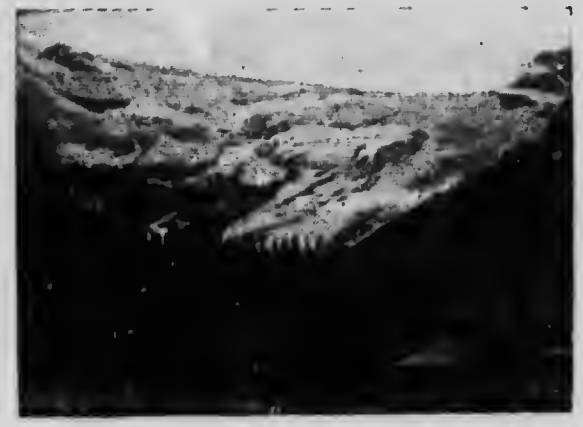


Fig. 130.

View of the Great Glacier in the Selkirk Range of the Rocky Mountains. Note the railway station at the foot of the mountain.

There are twelve principal passes in this range. Through *Crow's Nest Pass* runs the British Columbia Southern Railway; through *Kicking Horse Pass* the Canadian Pacific Railway at an elevation of 5296 feet. Farther north are the *Yellowhead* and the *Pine River* Passes. Through the former the Canadian Northern Railway Company contemplated, a few years ago, an extension of their system, to reach the coast at the mouth of Bute Inlet, thence across the narrow strait by ferry to the nearest point of Vancouver Island, thence by rail to Victoria. Through the latter the Grand Trunk Pacific will, it is said, find its way to the western coast.

Across a long, straight valley of considerable width, through which wind the *Columbia* and *Fraser* rivers, lies a second range or series of ranges, somewhat wider than the first, and of slightly less elevation, generally known from the name of its principal member as the Selkirk Mountains (Fig. 130). These are well defined throughout the southern half of the province, and near the boundary are broken up into a number of smaller parallel ranges. In the northern half of the province the Selkirks, here called the Cariboo Mountains, lose their rugged grandeur and fade away into the wide and fertile plateau where the *Peace* and *Liard* rivers have their birth. The average width of the Selkirks is about eighty miles.

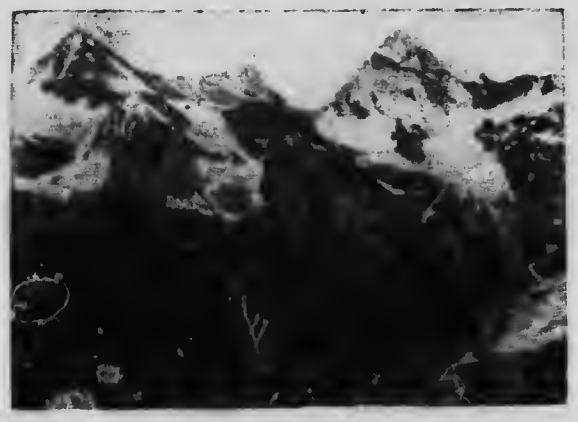


Fig. 131.

Mount Sir Donald and Eagle Peak in the Selkirks.

West of the Selkirks is a wide plateau of varying altitude, the average height being about 1500 feet, intersected by numerous mountain-fed rivers with their lake expansions. Beyond this central plateau is the Coast Range whose western foot-hills form a precipitous barrier to the waters of the Pacific.

A glance at the map will show the extreme irregularity of the coast line of British Columbia. Here we find a sinking coast, and the innumerable narrow and deep inlets, resembling the fjords of Norway, are the drowned valleys and canyons of the foot-hills of the Coast Range. Some of these inlets, scarcely more than a stone's throw in width, are so deep that vessels cannot find anchorage within them. In Vancouver and Queen Charlotte Islands are found the surviving summits of the Island Range, the fourth and partially submerged member of the mountain system of British Columbia. This is the lowest of all, its greatest elevations being about 7000 feet.

Rivers. — British Columbia is the birthplace of all the large rivers of northwestern America. The *Columbia* rises in the glaciers of the western slopes of the Rocky Mountains and after tortuous windings amid the broken ranges of the Selkirks finds its way to the ocean between the states of Washington and Oregon. The *Fraser* River also rises on the slopes of the Rockies, drains the southern half of the central plateau, and empties its waters into the Strait of Georgia. The *Yukon* rises in the watershed that crosses the northern portion of the province. The *Mackenzie*, by means of its tributaries, *Liard* and *Peace*, finds its sources in the wide plains that cover the northeastern corner of the province. The *Skeena*, *Nass*, and *Stikine* are rivers of considerable size which take their rise in the northern plateau and find their way to the Pacific through depressions in the Coast Range.

Fig. 132.

Bonnington Falls on the Kootenay River.

All of these rivers are rapid and turbulent, and carry to the sea vast quantities of sediment from their mountain homes. In the case of the Fraser the turbid current can be traced into the quiet waters of the Strait of Georgia for miles. Large areas of flat alluvial land have thus been

built up at the mouth of the river, which was once sixteen miles farther inland, where the town of New Westminster now stands.

Lakes. — There are numerous lake expansions, many being of large size. The principal are: In the south, *Kootenay, Slocan, Arrow* (Upper and Lower), *Okanagan, Shuswap,* and *Harrison;* in the central part, *Quesnel, Babine,* and *Stuart;* on the northern border, *Laka, Atlin,* and *Teslin.*

Scenery

In a country so well watered and so diversified in its surface features the scenery must of necessity be indescribably grand. The snow-covered mountain ranges, the great glaciers, the canyons, the wild, foaming mountain streams with their rapids and waterfalls, numberless mountain lakes, clear and placid, reflecting the glory of hill and sky, the narrow valleys and wider plains with their setting of evergreen forest and snowy mountain peaks, the dissected coast line with its countless bays and islands fringing the great Pacific, all combine to produce an aggregation of scenic effect not elsewhere surpassed. Because of the grandeur and beauty of her natural scenery British Columbia is attracting a large and rapidly increasing tourist trade.

Climate

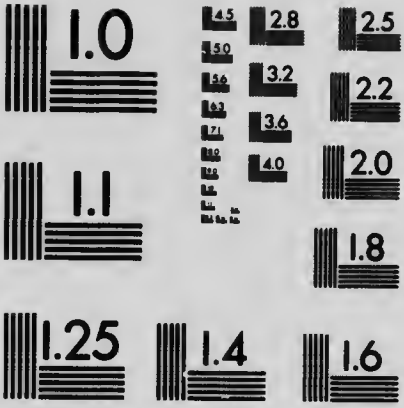
There are in British Columbia several well-defined climate belts.

1. The humid coast region with excessive rainfall, chiefly during winter, and but little snow or frost.

2. East of the Coast Range, throughout the central plateau, is found what is known as the Dry Belt, where the precipitation is very slight and the extremes of heat and cold are somewhat greater than at the coast.

3. In the elevated valleys of the Selkirks and Rockies the precipitation is greater and more uniform. On the mountain summits this falls as snow, even in midsummer, and thus are formed those large glaciers in which the rivers of the province have their sources.

This diversity in climatic conditions is due to local causes. The prevailing westerlies blow from the Pacific, warmed by the Japan Current and saturated with moisture. On reaching the cold air surrounding the highlands of the Island and Coast ranges, their moisture is in part condensed and falls as rain. At the same time the condensation of the water vapor liberates latent energy in the form of heat, giving to this region its mild winter temperature.



Along the eastern coast of Vancouver and Queen Charlotte Islands the rainfall is much less. The comparatively small rainfall at Victoria is due to the fact that the prevailing westerlies reach the southern point of Vancouver Island after crossing the high Olympian Mountains in Washington, by which they are robbed of much of their moisture, and also to the fact that there are no great elevations in the vicinity of Victoria to increase the precipitation. Crossing the Strait of Georgia, the westerly winds have their moisture still further condensed by the coast mountains, giving increased rainfall to the mainland coast. Beyond the Coast Range the eastward-moving air, still retaining moisture, passes over the central plateau with but little condensation, thus causing a wide dry region. The increased precipitation in the region of the Selkirk and Rocky Mountains is due to the further condensation caused by their lofty, snow-bound peaks.

Throughout the Island and Coast regions there is comparatively little rain during the midsummer months of July and August, this period being one of almost continuous sunshine.

Lumbering

The province is well wooded in all parts excepting its high mountains and dry areas. Owing to the moist, mild climate of the islands and coast these regions are heavily timbered. Nowhere else in the world is timber found so large and valuable. Here the Douglas fir grows to a height of 300 feet with a diameter of ten feet and more, one such tree furnishing sufficient lumber to build a house of moderate size. From the Douglas fir are cut and shipped immense quantities of lumber. Some goes to Alberta, Saskatchewan, and Manitoba by the Canadian Pacific Railway, but more is sent by ships to Japan, China, South America, and Europe. Some of the ships thus employed have a capacity for over 2,000,000 feet and require fifty days in which to load.

Fig. 133.
Chopping down a big tree in the forests of British Columbia.

As the largest trees are found near the coast and waterways and as the mills are so placed that the ships can load within a few yards of the saws, the cost of sawing and shipping the lumber is comparatively small.

To fell one of these forest giants is no easy task. The wood at the base is very resinous and hard, so the workmen mount on spring-boards some six or eight feet high, to a point where the cutting is not so difficult, and labor, perhaps for hours, with axes and saw, till their task is accom-

plished, and the monarch falls, with tremendous crash and roar, to the ground (Fig. 133). The tree is then sawed into suitable lengths, perhaps eighteen, twenty-four, or thirty feet, which are rolled or dragged by horses or stationary engines and ropes to a skid road not far away, along which they are dragged to the sea, where they are collected into rafts to be towed to the nearest mill. Sometimes, when cut at a considerable distance from the sea, they are taken to a branch railroad and loaded upon flat cars, a single log sometimes being a load for a car.

FIG. 134.

Royal City saw-mills, New Westminster. Cutting a large log.

The largest mill in the province is at Chemainus, on Vancouver Island. There are also large mills at Vancouver, New Westminster (Fig. 134), and Victoria, and many smaller ones at different points on the coast and in the interior.

Next in importance to the Douglas fir is the red cedar, which also grows to great size on Vancouver Island and along the valleys of the coast. Logs of eight to ten feet in diameter are not uncommon. This tree is used chiefly for making shingles which are noted for their durability. These are shipped to all parts of Canada. On account of the straight-grained wood of the cedar the pioneer settler building for himself a home in the forest, remote from the mills, is able to split boards, shingles, and pickets out of which he can construct his buildings and fence his lands. The red cedar is also largely used as a wood for interior furnishing, as it has a fine grain and takes a beautiful polish.

Other cone-bearing trees abound throughout the province. Of these, spruce and balsam are of greatest economic importance. These trees furnish lumber for a variety of uses, but are chiefly valuable as material for pulp-making, an industry now in its infancy but of great promise. With ample water-power and an unlimited supply of these soft-wood trees close to shipping facilities, it seems probable that pulp-making will soon rank as one of the leading industries.

The forests of this Pacific province, unlike those of eastern Canada, contain comparatively few of the broad-leaved or hardwood trees. There are no beech, elm, or ash trees, and comparatively few oaks, maples, and birches. Poplars are abundant in places, and at the coast the alder grows into a forest tree sixty or seventy feet high.

Fishing

Fishing is one of the leading industries of British Columbia. The catching of the fish, preparing them for market, and canning the salmon give employment to thousands of men during the fishing season.

Salmon. — During the salmon "run" countless numbers of this fish swarm the coast waters on their way to the upper courses of the rivers to spawn. Indeed, the lower waters of the rivers seem alive with them at times, the fish actually crowding some of their number ashore. This is the busy season for the fishermen, and for the numerous canneries situated near the mouths of the rivers. Hundreds of men, chiefly Japanese and Indians, go out and catch the fish with gill nets, filling their boats in a short time. Trap seines are also set along the shores, in suitable places, and catch the fish by thousands as they swarm toward their breeding-grounds. The fish are delivered by boat loads at the canneries, where they are put through the several interesting stages of the canning process (Fig. 135). The finished cans, holding about one pound each, are labelled and packed into cases each containing four dozen tins. There are more than eighty canneries in the province. In 1901 the season's pack consisted of 1,236,156 cases, valued at about $6,000,000. The chief market is found in England, where the season's pack is contracted for by large dealers even before the catch is made. Fresh salmon is now shipped in large and increasing quantities, by means of cold storage, to eastern markets. An inferior quality known as dog salmon is salted and dried for the Oriental market.

Fig. 135.

Hundreds of salmon in a cannery.

Halibut. — Next in commercial importance is the halibut, which is found in great abundance on the west coast of Vancouver and around the north of Queen Charlotte Islands. One large company which conducts most of the fishing has four steamers which ply continuously between the fishing grounds and Vancouver, at which point the fish are packed in ice

and shipped in car or train loads, by fast service, to Boston. One hundred thousand pounds is not an uncommon catch for one of these steamers as a result of a few days' fishing.

In addition to the salmon and the halibut, several species of cod abound. The **oolachan**, or **candle fish**, is a small fish which swarms the rivers and inlets during March and April. It is a very oily fish, as its name implies, and of excellent flavor. The Indians preserve the oil, which they use much as we use butter. The **anchovy** is also abundant, of large size, and excellent quality. **Herring** and **bass** are plentiful.

Sealing

For years the fur seal, once very abundant in the Behring Sea, around the Aleutian Isles, and on the coasts of British Columbia and Japan, has contributed in no small degree to the wealth of the province. A few years ago the sealing fleet, consisting of fifty or more vessels, was a familiar sight in Victoria Harbor, leaving in early spring for the northern waters, where the seal makes its home, and returning with their catches in the autumn. In recent years, however, there has been a falling off in the abundance of the seals, owing to their partial extermination or to their abandonment of their accustomed haunts. Closer restrictions have also been placed upon the business of seal-hunting, so the business has greatly decreased.

Mining

Notwithstanding the great wealth of its forests and seas, British Columbia is essentially a mineral-producing country. Here the earth's crust has been uplifted, tilted, and denuded on a gigantic scale, so that its exhaustless store of precious and useful metals has been brought within reach.

Gold. — In 1858 gold was found in the gravel bars of the lower Fraser. Adventurous prospectors followed the golden trail up the river till, two or three years later, on the upper tributaries they discovered the exceedingly rich placers of the Cariboo District, which yielded some $50,000,000 of the precious metal. Reports of the golden wealth of this district spread abroad and caused a rush of gold-seekers from the failing gold fields of California and from other parts of the world. During one year 20,000 miners came from San Francisco alone.

During those early years the pick and shovel and rocker were the primitive implements used by the placer miner, and these are still used in the newer and less easily accessible "diggings." When, however, better

communication is opened with the outside world and capital is available, the more scientific and effective method known as hydraulicking is adopted.

Gold is found in nearly all of the creeks and rivers of the province, though in many instances the quantity would not pay for working. Many of the creeks and river-beds, however, that are considered too poor for white men are worked by Indians and Chinese, who are content with a return of one or two dollars a day. Gold is also found pretty generally throughout the province in veins or lodes. From such sources it is obtained by crushing and washing the ore and collecting the gold by a process known as amalgamation. When gold is found mixed with other metals, such as silver, copper, or lead, the ore is smelted and the gold afterwards separated from the accompanying metals (Fig. 136).

FIG. 136.
Smelter at Trail, B.C. Here gold, silver, copper, and lead are smelted.

Silver and Lead ores are found chiefly in the vicinity of the Selkirk Mountains. To encourage the production of lead the Dominion Government in 1903 passed an act providing for the payment of a substantial bounty on all ore smelted in Canada. This has greatly stimulated the lead-mining industry and incidentally silver production as well, for the lead ores usually carry more or less silver.

Copper is found in many parts, frequently carrying gold in its ores, which are chiefly sulphides. Smelters at Ladysmith and Crofton produce large quantities of gold-bearing copper ores. Copper is found chiefly in West Kootenay, at Howe Sound, and on Vancouver and Texada islands. The annual product is over 30,000,000 pounds.

Iron. — Magnetic iron ore in unlimited quantity occurs on Vancouver Island. The smelting of this ore will no doubt be an important industry in the future.

Zinc, Platinum, Arsenic, and other metals of minor importance have been found in limited quantities, but have not as yet been mined to any extent.

Coal is abundant and widely distributed. Coal mining, however, is confined to a few localities easily accessible to means of transportation. The oldest collieries are on the eastern side of Vancouver Island. These, with an annual output of about one million tons, supply the coast cities, the Pacific steamships, and export largely to San Francisco. Within recent years important mines have been developed at Crow's Nest Pass. Both here and at Union, on Vancouver Island, coke is manufactured in large quantities for the use of smelters (Fig. 137). Large deposits of coal occur on Queen Charlotte Islands, but have not yet been developed.

With its 300,000 square miles of mineral areas, only a small fraction of which has as yet been prospected, with its abundance of coal and limestone widely distributed, and with its unlimited supply of the useful metals, it seems not unlikely that British Columbia will become one of the greatest mining and manufacturing countries in America. The awakening of Japan to commercial activity, her example to be followed no doubt by China, must inevitably lead to

FIG. 137.
View of the coke ovens at Fernie, B.C.

great industrial expansion on the north Pacific coast of America, no portion of which is in a better position than British Columbia to take advantage of the opening opportunities.

AGRICULTURE

Scattered throughout the province are numerous tracts of very fertile land, so that agriculture is rapidly becoming a leading industry. In the interior much attention is given to stock-raising and mixed farming, as well as to the cultivation of fruit. In the coast district the farms are small, but the land is of extraordinary fertility. The principal crops are oats, barley, and hay. Fruits of all kinds, particularly peaches, pears, plums, apples, and grapes, are grown almost everywhere throughout the southern and coast regions.

Commercial Highways and Commerce

The chief products of British Columbia have already been noticed. Her foreign trade consists in the exportation of these products and the importation of manufactured goods. Her trade route lies in all directions. The Canadian Pacific Railway is the chief means of communication with eastern Canada. Another Canadian transcontinental railway — the Grand Trunk Pacific — is under construction through the more northerly part of the province, while the southern border is tapped at several points by the Great Northern and Northern Pacific railroads, with transcontinental connections. The greater part of her imports of manufactured goods reaches the province by these several railways. The most of her export trade, however, is carried on by water routes. Lines of steamers run to northern points carrying supplies to the great mining districts of northern British Columbia and the Yukon, and southward to the Pacific States and Mexico. Japan and China are connected with Victoria and Vancouver by the Canadian Pacific Railway steamship lines.

The chief imports from Japan and China are rice, tea, silks, and a great assortment of novelties and bric-a-brac known as Japanese and Chinese goods. The Chinese population also imports the greater part of its groceries from Hong Kong. A small seedless orange, of delicious flavor, is imported from Japan in considerable quantity. The exports to these countries consist of fish, flour, and lumber.

Steamship lines also connect British Columbia with Australia and New Zealand. From the former country canned and frozen meats, butter, and fruits are imported.

The China Mutual Steamship Line makes connection, monthly, with England via the Suez Canal, bringing manufactured goods and returning with canned salmon, seal skins, and miscellaneous products.

Cities and Towns

Victoria was founded in 1843 as a Hudson's Bay Company's trading fort, under the name of Camosun. It is the capital city of the province and contains the local parliament buildings, the handsomest in Canada (Fig. 141).

Having an excellent harbor and being favorably situated from a commercial point of view, it enjoys a large shipping trade. ESQUIMAULT HARBOR, four miles distant, is very strongly fortified and is garrisoned by Canadian troops (Fig. 138). The beauty of her natural surroundings and the delightful coolness of her summer climate attract to Victoria crowds of tourists. The city contains several private schools and is the seat of Victoria College, in affiliation with McGill University of Montreal. Victoria has its Chinese quarter, in which the visitor might readily imagine himself in a section of Canton. Here the streets are lined on either side with shops adorned with signs in Oriental characters and filled with curious articles of Chinese manufacture. Men, women, and children may be seen about the streets and shops, clothed in native costume, and chatting in their own language.

FIG. 138.
Harbor at Esquimault.

VANCOUVER, on Burrard Inlet, was founded in 1885, and has had a remarkable growth (Fig. 139). It is the terminus of the Canadian Pacific Railway and of the steamship lines to Japan, China, and Australia, and hence is a city of large commercial importance. It contains a sugar refinery, large lumber and shingle mills, and many other local industries. It has many handsome buildings and is the seat of McGill University of British Columbia and of the Normal School.

FIG. 139.
Vancouver.

NEW WESTMINSTER, near the mouth of the Fraser River, was the capital of the old crown colony of British Columbia (Fig. 140). It is the centre of the salmon-canning industry of the Fraser River,

on which forty-four canneries are located. It is also the market town of the large and fertile valley along the lower Fraser. The city is connected with the opposite side of the river by a fine steel railway and traffic bridge recently completed. Among the institutions of the city are the Exhibition Building, the Penitentiary, and the Asylum for the Insane. The city is also the seat of Columbia College.

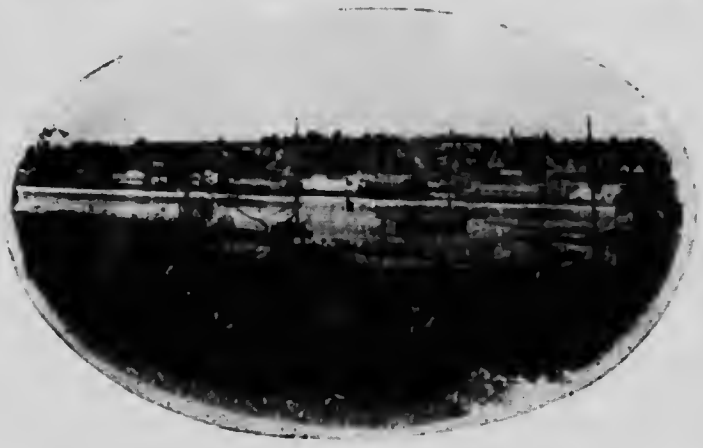


FIG. 140.
New Westminster.

NANAIMO, on Vancouver Island, is the most important coal-mining centre of the province. It is the shipping port of the Western Fuel Company. KAMLOOPS, on the Canadian Pacific Railway, at the junction of the North and South Thompson rivers, is an important district centre. REVELSTOKE, on the Columbia, is a railway divisional centre and a point of departure of traffic for the Kootenay District. NELSON, at the head of the Western Arm of Kootenay Lake, is the commercial centre of a large mining area. KASLO, on Kootenay Lake, is the point from which the Kaslo and Slocan Railway enters the Slocan mining district. FERNIE, in the centre of the Crow's Nest Pass coal-mining region, has a large number of coke ovens, which supply the smelters of the interior. ROSSLAND, on Trail Creek, is the largest mining town in the Kootenays. TRAIL, on the Columbia at the junction of Trail Creek, has a large smelter in which the ores of a number of large mines in the vicinity are treated. VERNON and KELOWNA, on Okanagan Lake, are in the midst of an excellent fruit-growing district. Tobacco is raised at the latter place. ATLIN, on Atlin Lake, upon the northern border, came into existence in 1898 as the result of the discovery of gold in Pine Creek. It is the official centre of the Atlin mining district.

GOVERNMENT

The government of British Columbia is similar to that of the other provinces. There is a *Lieutenant-Governor* representing the Crown, a *Legislative Assembly* of forty-two members elected by the people, and a *Cabinet*, or *Executive Council*, of seven members, chosen from among the party having a majority in the Legislative

Assembly (Fig. 141). The province is represented in the House of Commons by seven members and in the Senate by four members. In cities and towns, and in several districts where the population is sufficient, municipalities are formed for the control of local affairs.

Fig. 141.
Provincial Government Buildings, Victoria.

VII. YUKON

Yukon Territory lies north of British Columbia, between Alaska on the west and the Rocky Mountains on the east. Its only seacoast is a short stretch on the Arctic Ocean, but this, on account of the ice, is of very little use.

Physiography. — The surface, consisting of mountains and plateau, greatly resembles that of northern British Columbia. It has an area of about 192,000 square miles, nearly all of which is drained by the upper courses of the great river from which the district takes its name. In the southwest corner of Yukon Territory and in the districts immediately adjoining are to be found the most elevated mountains in North America. In the Yukon is Mt. Logan; just across the Alaska border is Mt. St. Elias; while in the adjoining corner of British Columbia is Mt. Fairweather, the most elevated peak in that province.

Climate. — The northern part of Yukon is within the Arctic Circle, and throughout the whole territory the winter climate is very severe. Snow falls in September, and the rivers and lakes freeze up in early October, even in the southern parts. At Dawson, near the centre of the territory, the winter temperature sometimes falls to 70° below zero, the average for December, January, and February being about 15° F. But the winters are enjoyable notwithstanding the severe cold. The air is clear, dry, and invigorating, and the people go about freely out of doors even on the coldest days. Many of the people have dog teams, just as those in warmer countries have their horses and carriages. A favorite winter amusement is "mushing" over the hard, smooth snow in sleighs drawn by two or more pairs of dogs.

The midwinter days at Dawson have only about four hours of sunshine, the sun setting about two o'clock in the afternoon. In midsummer the nights are correspondingly short, but even after sunset it remains almost as light as day, as the sun sinks but a short distance below the horizon. Farther north, within the Arctic Circle, the sun does not set for days or weeks together, and disappears for a similar period in winter.

Vegetation. — The valleys of the southern part are well wooded. The principal trees are spruce, fir, birch, aspen, balsam, and poplar, of somewhat smaller size than their more southern representatives.

FIG. 142.
This is the simplest and most primitive way of gold seeking. Placing some of the gravel in a trough of water, it is rocked back and forth in such a way as to cause the heavier particles of gold to separate from the gravel, while the lighter materials are thrown away.

During the warm, short summer the vegetation grows very rapidly. Most of the fruits and grains that ripen in the region around Edmonton will ripen in southern Yukon. Even as far north as Dawson vegetables can be successfully grown.

Gold. — To discovery of this precious metal along its river beds Yukon owes its importance and its population. The most productive area in the territory is the *Klondyke*. This region, covering about 1000 square miles, lies between the Klondyke and Indian rivers and to the east of the latter. Numerous small tributaries flow through this area. The most important are *Bonanza*,

Eldorado, ***Bear***, ***Hunker***, ***Too Much Gold***, and ***Last Gold*** creeks, flowing into the Klondyke, and ***Dominion***, ***Sulphur***, and ***Quartz*** creeks, flowing into Indian River. These streams lie in deep, trough-like valleys, along the bottoms of which the gold is found. It is also found in the terraces or branches lying a little above the present river beds.

FIG. 143.

Sluicing on Bonanza Creek, showing method of washing gravel containing particles of gold.

In 1896 George Cormack, a hunter and prospector, who had settled in Yukon and married an Indian wife, discovered gold on Bonanza Creek. In the same year a Nova Scotian named George Henderson made a rich strike on Gold Bottom Creek. The news spread, and soon hundreds of adventurous gold-seekers were on their toilsome way into the new diggings. The fabulous success of some of these drew thousands of others after them during the next two or three years. On some of the claims, pans of gold were found that washed out hundreds of dollars, and a few of the adventurous pioneers who went into the country owning nothing but their outfits, returned millionnaires.

Mining is carried on chiefly in winter. First the layer of moss, or "muck" as it is called, which covers the surface to a depth of several feet, is removed. Fires are then built in the hole or shaft, and a foot or two of the gravel thus loosened is thrown out. This process is repeated over and over till bed-rock is reached, at a depth of five to twenty-five feet, where most of the gold is found, some in nuggets and more in fine grains or dust. Tunnels are then run along horizontally and the gold-bearing gravel removed and piled upon the surface, to be panned or washed when the warm spring sun shall have unlocked the streams from the icy grasp of winter.

Districts and Towns. — The chief mining districts besides the Klondyke are the Stewart River, Big Salmon, and Alsek districts. The last is 185 miles northwest of White Horse, the terminus of the White Pass and Yukon Railway. The discovery of gold on one of the tributaries of the Alsek River in 1903 led to a rush thither during that and the following year.

The chief town of Yukon is DAWSON, at the confluence of the Klondyke and Yukon rivers. This city grew up during the famous Klondyke rush, and at one time had a population of nearly 10,000. The number has, however, greatly decreased, owing to the fact that some of the richest claims in the vicinity have been worked out and the miners have migrated to other fields. It is the seat of the government of the territory.

FIG. 144.
Boxes of gold awaiting shipment from Dawson City.

The chief route to Dawson and the Klondyke is by way of the White Pass and Yukon Railway from Skagway to White Horse, 112 miles, thence by steamer down the river for the remaining distance. In winter mails and passengers are carried over the ice by dog teams. The greater part of the freight designed for Dawson and neighboring camps is carried up the Yukon in summer, from St. Michaels at its mouth, on flat-bottomed river steamers.

Government. — The Yukon is administered by a *Commissioner*, who is appointed by the Governor-General in Council. The Commissioner is assisted by a *Council*, in part appointed by the Crown and in part elected by the people of the district. The Yukon has one member in the House of Commons.

VIII. MANITOBA

The Three Prairie Levels. — Before beginning the geography of Manitoba, notice must be taken, as a whole, of the great plain which makes up the three prairie provinces of the Dominion, viz., Manitoba, Saskatchewan, and Alberta. This plain extends almost from the eastern boundary of Manitoba to the foothills of the Rocky Mountains in Alberta. The plain has a height of 700 feet in the Red River Valley and reaches an elevation of 4000 feet at the foothills of the Rockies.

The plain is divided into three distinct levels or steppes by the presence of two lines of hills more or less broken, stretching from southeast to northwest. The average width of the first or lowest level is 120 miles, its area 55,000 square miles, and its elevation about 750 feet. This portion of the plain includes a large part of Manitoba.

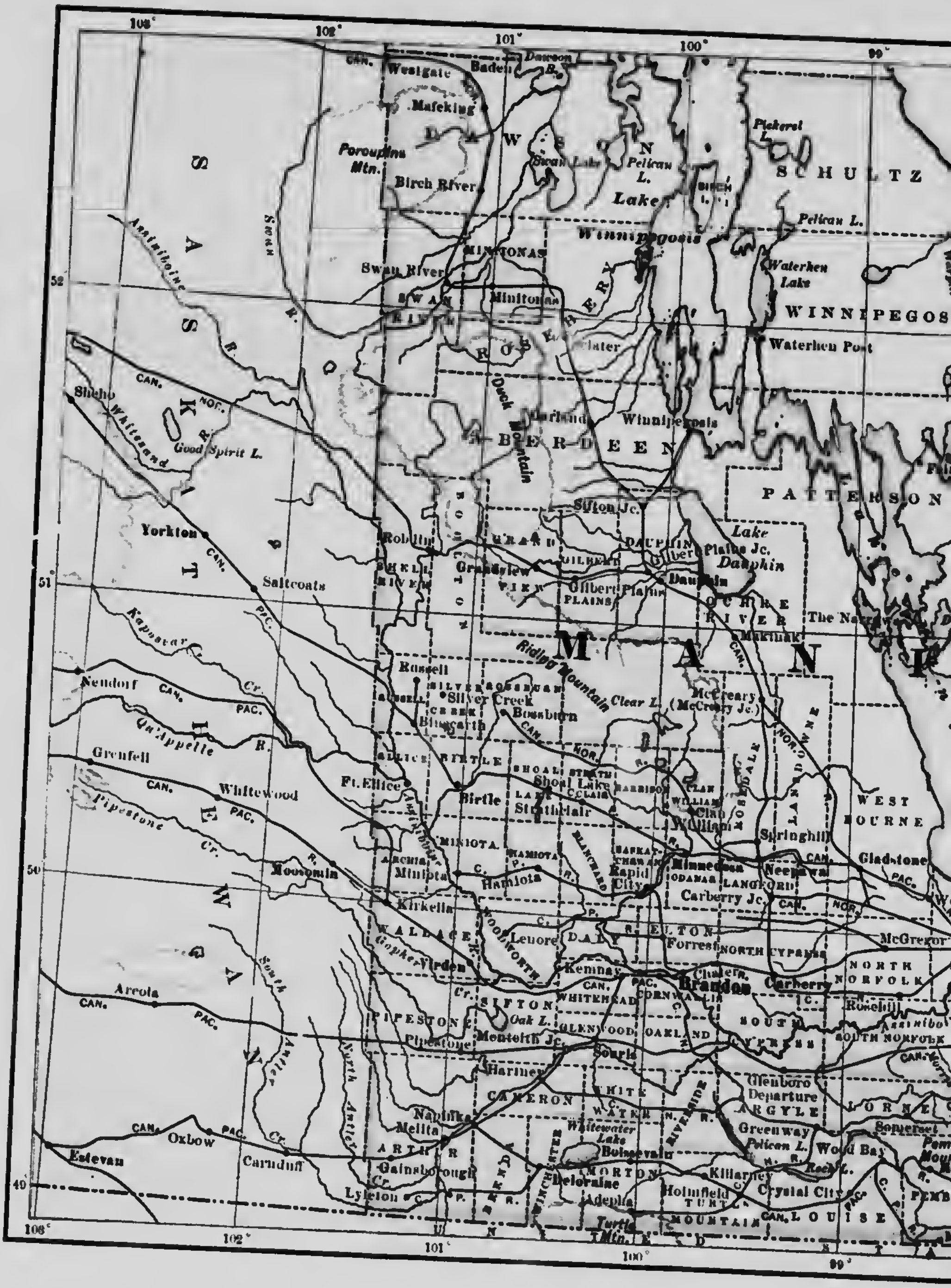


Fig. 145

Map Questions.—(1) Trace the boundaries of Manitoba. (2) Draw a map of the Province, locating the principal highlands, the larger lakes and the most important rivers. (3) Show clearly how Lakes Winnipeg, Manitoba and Winnipegosis are connected. (4) Point out the islands in each of these lakes. (5) Trace the courses of the

Fig. 145.

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Red and Assiniboine Rivers. (6) Point out the rivers that flow into Lake Winnipeg. (7) Trace the lines of railway. (8) Show how Manitoba is connected by railway with the other Provinces to the east and to the west. (9) Point out the geographical advantages in the location of Winnipeg. (10) Name and locate the principal cities and towns.

The middle, or second prairie level, is 250 miles wide, its area 105,000 square miles, while its elevation is about 1600 feet. It is separated from the first level by a line of hills which enter the country from the sou' .nder the name of t' *Pembina Mountains* and continues northwestward under the names o: the *Brandon Hills, Riding Mountains, Duck Mountains,* and the *Porcupine* and *Pasquia Hills.* Trace these on th map (Fig. 145).

The third level is about 450 miles wide, with an area estimated at 134,000 square miles. Its elevation increases from 2000 feet on its eastern edge to 4200 feet at the foot-hills of the Rockies.

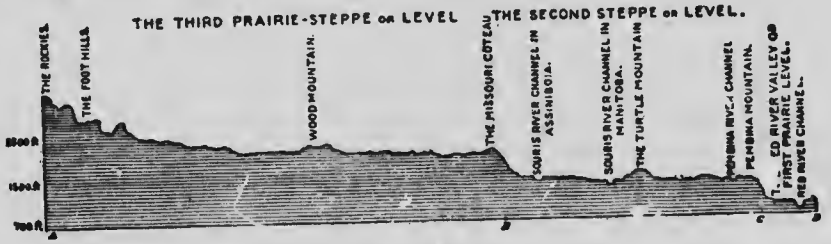


FIG. 146.

Profile map of the three prairie levels at the boundary line between Canada and the United States.

Physiography. — The eastern and northeastern portion of Manitoba covers a portion of the rocky and wooded Laurentian plateau, a region of rough broken country, full of bogs, covered in part with forests of small trees.

Manitoba has three distinct slopes: the Red River Valley which slopes northward, the valley of the Winnipeg River, and the east shores of Lake Winnipeg which slope to the west. The Red River Valley includes within its area Lakes Winnipeg, Manitoba, Winnipegosis, and Dauphin, while the Assiniboine Valley draws to itself all the drainage of central and western Manitoba. The westerly slope drains the eastern portion of the province, the chief feature of which is the Winnipeg River, a typical Laurentian stream, which finds its way to Lake Winnipeg.

The Red River Valley is bordered by several ranges of hills, known in various parts as the *Pembina, Riding,* and *Duck Mountains,* and the *Porcupine* and *Pasquia Hills.* In the southwestern part of the province are found the *Turtle Mountains.* The Riding, Duck, and Turtle Mountains have lately been reserved by the Dominion government for the purpose of protecting the forests that are found there.

The rivers flowing through the first prairie plain have little or no valley to speak of. They are now wearing away their banks very

rapidly, making their valleys; but those which run through the second prairie level flow through deep valleys bordered by hills 200 to 300 feet high, the valley being in some places half a mile to a mile wide. For example, the Assiniboine, where it enters Manitoba on the second prairie level, runs between hills 250 to 500 feet high and a valley from one-half a mile to three-quarters of a mile wide; while at Winnipeg, on the first prairie level, often, at high water, it overflows its banks. The reason of this is that the second plain was elevated long before the first, consequently the rivers in that section have worn out deep valleys in the course of ages. Many of the side hills of the older river valley are wooded. The prairie of the Red River Valley is almost level, but on the second plain it is mostly rolling.

Rivers. — The rivers of Manitoba are not large, but they are important for many reasons. The chief river of Manitoba is the *Red River* with its numerous tributaries. It is nearly 700 miles in length, rising in the state of Minnesota, flowing northerly with a very winding course and emptying into Lake Winnipeg. It carries a great deal of sediment, with which it is gradually building up a delta encroaching on the lake.

Before the days of railways the Red was much used for freighting purposes. Improvements are being made at St. Andrew's Rapids, about twenty miles from Winnipeg, and when these are completed it is expected that there will be communication even for large boats between Winnipeg and Grand Rapids on the Saskatchewan. The chief tributaries of the Red River are the *Pembina* and the *Assiniboine* from the west; and on its east bank several small streams enter, the chief of which is the *Seine*, which enters opposite Winnipeg. The Pembina rises in southern Manitoba, its head waters being Rock, Swan, and Pelican Lakes. It flows almost due east, crossing the boundary into North Dakota and finding its way into the Red River at the town of Pembina a few miles across the border line. The Assiniboine rises in Saskatchewan and at first flows southeasterly. It takes a sudden bend to the east near Brandon and there flows east, entering the Red River at Winnipeg. It receives numerous streams from the Duck and Riding Mountains, such as the *Shell* and *Bird Tail*. From the west it receives the *Qu'Appelle* and *Souris* rive The Qu'Appelle rises near the South Elbow of the South Saskatchewan. Flowing through a deep, broad valley, the river broadens into several lovely lake expansions, which are noted for their fishing and shooting. It joins the Assiniboine near Fort Ellice, close to the western boundary of Manitoba. The Souris or Mouse River rises on the east side of the Missouri Côteau and flows in a southeasterly direction into the United States. It then makes a sharp turn to the north, joining the Assiniboine near Brandon. The Souris has the *Great* and *Little Antlers* as tributaries.

Flowing into Lake Winnipeg from the southeast is the *Winnipeg River*, which takes its rise in the Lake of the Woods, Ontario. It is a rapid stream, with a great number of rapids and falls (Fig. 147). Numerous small rivers flow into Lake Winnipeg from the east and west, many on the east side being unexplored. The most important is the *Dauphin River*, flowing from Lake St. Martin. This river is the outlet by which Lakes Manitoba and Winnipegosis are drained.

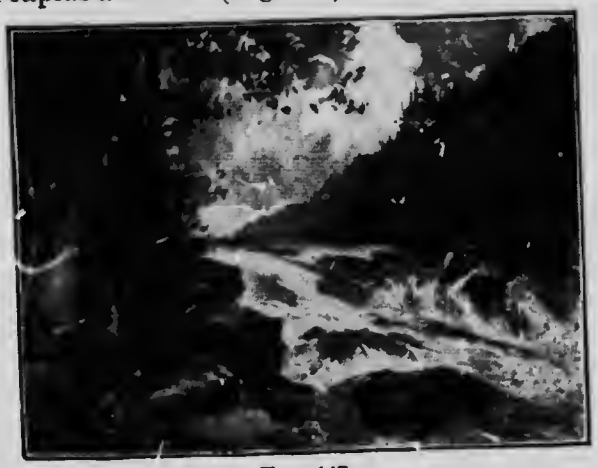


FIG. 147.
A rapid on the Winnipeg River.

Lakes. — Fully three-quarters of Manitoba was once the bed of an ancient lake, which extended far into Ontario and the United States. It is called *Lake Agassiz*, in honor of a famous Swiss scholar. Here and there in the province are to be found many remains of its gravelly beach and many banks and hills of sand formed along its shores. The chain of hills running northwesterly across Manitoba was its western shore. Lakes *Winnipeg*, *Winnipegosis*, *Dauphin*, and *Swan* are the remains of this once great lake. Lake Winnipegosis is a northerly continuation of Lake Manitoba and is connected with it by *Ebb and Flow River*, so called because the water of this river flows backward or forward, according as the wind forces the waters of Lakes Manitoba and Winnipegosis north or south. Lake Manitoba is drained by the *Fairford River* into Lake St. Martin, and it in turn is drained by the *Dauphin River* (formerly called the Little Saskatchewan) into Lake Winnipeg. Lake Dauphin is drained by the *Mossy River*, and Swan Lake by *Shoal River*, both flowing into Lake Winnipegosis.

Lake Winnipeg, the largest of the group, is about 250 miles in length and varies in width from 25 to 60 miles. It is, however, very shallow, its greatest depth being 60 to 70 feet. An immense volume of water flows into it, for in addition to all the water from the rivers and lakes before mentioned it also receives the waters of the Saskatchewan River, which rises in the Rocky Mountains. Lakes Manitoba and Winnipegosis are also shallow, surrounded by low shores and filled with small islands. Lake Dauphin is similar to the other lakes. All of the Manitoba lakes abound with fish, and a very valuable trade is carried on, principally with the United States.

Climate. — The climate of Manitoba varies greatly, according to the season of the year. The summers are warm, while the winters are severe. Frequently in summer the thermometer reaches as high

as 90° and over, but in winter it drops as low as 40° below zero. The skies are bright and sunny all the year round, while the air is dry and bracing. Even in the hottest summer the evenings are delightfully cool. The rainfall is abundant and generally well distributed.

Fig. 148 *A*.
Ploughing scrub land near Portage la Prairie.

Agriculture. — Manitoba has all the necessary conditions for successful grain growing, and it is for this reason that grain growing forms the leading industry of the province. The greater part of Manitoba being once the bed of an ancient lake, the soil brought down by the rivers flowing into it settled at the bottom and formed the rich alluvial soil which has made the province famous as a grain-producing country. This rich soil, coupled with the long summer day and short summer night, enables the wheat plant to pass from its seed time to harvest in from 85 to 105 days. The principal crop is *wheat*, and Manitoba is famous the world over for its excellence. The grain grown in Manitoba is all sown in the spring. It is a wonderful sight in the latter part of August to see mile upon mile of golden grain reaching as far as the horizon. Everything connected with wheat raising is on a large scale, the widest seeders, the largest of binders and threshing machines being used. The greater part of the threshing is done directly from the stooks, stacking when possible being done

Fig. 148 *B*.
A steam plow at work on the prairie.

away with. The grain is hauled in bulk to the nearest elevator. (Figs. 148 *A*, *B*, *C*, *D*.)

The Elevator System.— In travelling over the province, tall, boxlike buildings are seen all over the country, long before even the houses of the towns are viewed; these are the elevators into which the wheat is rushed during the harvest (Fig. 149). A glance at the map will show how well Manitoba is supplied with railways, and at almost every station the most prominent feature is the row of elevators. From these elevators the cars are loaded and the grain therein shipped to the flour mills or to the great terminal elevators at Fort William, Port Arthur, and other eastern points.

FIG. 148 *C*.
A reaping scene on the prairie.

Some idea of the immense importance of this business may be gained by the following facts: At the close of 1905 the Canadian Pacific Railway had the following elevators and storage owned by different companies at its various stations in Manitoba: the number of stations with elevators 168, number of elevators 504, warehouses 18, giving a storage capacity of 15,337,100 bushels. The Canadian Northern Railway at 103 stations had 195 elevators, 15 warehouses with a storage capacity of 5,319,000 bushels. This gives a total of 699 elevators and 33 warehouses, with a storage capacity of 20,656,100 bushels. Immense terminal elevators have been erected at Port Arthur and Fort William to receive the wheat from the Manitoba elevators (Fig. 81). Seventy million bushels of wheat were raised in 1905,

FIG. 148 *D*.
A threshing scene on the prairie.

and that from about one-quarter of the land fit for raising wheat. Besides wheat large crops of oats, barley, and potatoes are raised. The total area of land under cultivation in 1905 was 4,197,609 acres.

Method of Survey in the Western Provinces. — The method of survey adopted in Manitoba, Saskatchewan, and Alberta is well suited to the country, where agriculture on a large scale is the principal occupation and where so few landmarks can be seen on the vast open prairies. Lines called *township lines*, six miles apart, were first made, running parallel to the southern boundary line of the provinces. After this *range lines* running north and south, also six miles apart, were made. To save running up into large numbers a first range line, or as it is called *principal meridian*, was chosen, and a second, third, fourth, and fifth meridians were selected as starting points. The first meridian is placed a little west of Winnipeg. The township is thus six miles square. The townships are numbered, counting No. 1 from the 49th parallel northward. The ranges east of the principal meridian are called 1, 2, 3, etc., east, and those west of it 1, 2, 3, 4, etc., west. The latter ranges number up to 34, when the next meridian is reached, and the ranges west of it number from 1 to 30, reaching the third meridian, and so on. The township thus contains 36 square miles and is numbered from 1 to 36, and each square mile is called a section. Each section is subdivided into quarter-sections, named respectively Northwest, Northeast, Southwest, and Southeast quarter-sections. A section contains 640 acres, and a quarter-section 160 acres. *N. W. $\frac{1}{4}$ of Section 31, Township 10, Range 19 West.* To find this section, locate range 19 west of the principal meridian; then count 10 townships from the 49th parallel and where these lines meet is the township required; the northwest quarter of section 31 will be found to be in the extreme northwest corner of the township which contains the city of Brandon. Section posts placed on a mound marked with the range, township, and section number enable the settler to find the location of any place. Road allowances, 99 feet wide, are placed between each section running north and south and east and west. In

FIG. 149.
Elevators at a small country village.

the greater part of Alberta and Saskatchewan, however, the road allowance is 66 feet, running between each section north and south, and only between alternate sections running east and west.

A large and growing trade is being carried on in the raising of cattle for export. These cattle find ready sale in the British market and are a source of profit to the farmer. The raising of hogs is also attracting more and more attention. Pork-packing establishments have been erected in various parts of the province, and their products in addition to what is required for the home market find a ready sale in the mining districts of British Columbia. Little attention has as yet been paid to the raising of sheep, although there is no reason why Manitoba should not excel in this also. Ranching is carried on in certain parts of the province, but not much attention is paid to it, as, if this were carried on, there would be less of the land suitable for grain raising.

Almost all sections of Manitoba are suitable for dairying purposes, although some parts, owing to the abundance of good grass and a plentiful supply of water, are more suitable than others. Creameries and cheese factories are found all over the province. A successful dairy school is in operation in Winnipeg, and this has been of great benefit to the province. A good deal of the butter and cheese is sent to British Columbia and to the Yukon.

Fishing. — The principal fish caught in Manitoba, largely in Lakes Winnipeg, Manitoba, Winnipegosis, and Dauphin, are the whitefish, trout, pickerel, pike, sturgeon, catfish, tulibee, perch, and certain coarser fish. The annual catch exceeds 30,000,000 pounds, about one-third of this amount being whitefish. Most of the fish caught are exported to the United States. To secure this catch over 20 large fishing tugs, about 1000 boats, and over 10,000 nets and lines are employed; and about 150 freezers and ice-houses are required to preserve the fish until shipment can be made. The fisheries of Manitoba are kept under the strictest control by government inspectors appointed for that purpose.

Lumbering. — North of the prairie belt in Manitoba is an extensive forest country. Sawmills employing a large number of men are situated in all the lumber districts communicating with the leading centres by water or by rail. Some of these are found in the eastern part of the province along the western side of Lake Winnipeg and in the Riding Mountains, while there are also large saw-

mills at Winnipeg, Brandon, Selkirk, and many other points. Spruce is the timber used in all these mills.

Mining. — There are very few minerals in Manitoba, and mining is not one of the leading industries. In southwestern Manitoba there is some coal of a soft variety, but this is not extensively mined. Iron has been discovered in Black Island in Lake Winnipeg, and gypsum is found in the neighborhood of Lake Manitoba. At the town of Gypsumville, on the shores of Lake Manitoba, the gypsum is prepared for the market. Very promising salt springs have also been found near Lakes Winnipegosis and Manitoba. Limestone for building purposes is quarried extensively at Stonewall, Stony Mountain, and at Tyndall.

Manufacturing. — Manitoba is mainly an agricultural country, but there is no good reason why manufacturing should not be carried on to a considerable extent. Coal is near at hand and water power is abundant, electrical power being now delivered in Winnipeg developed from the water powers at Lake Du Bonnet. So far, however, manufacturing has risen largely from the needs of the farm and the city. Flour mills are to be found in almost every village, and this flour is not for domestic use only, but for export to eastern Canada, the United States, Great Britain, South Africa, China, and Japan. Machine shops, where threshing machines, engines, and farming implements are made, are in operation at Winnipeg and Brandon. There are several small cloth factories in the province. Brickmaking is an important industry, as is also the making of Portland cement. A large deposit of marl, from which cement is made, has been found near Morden.

Transportation. — Railways are of the greatest importance to Manitoba, as on these the province has to depend for the transportation of the immense crop of wheat and other grains raised each year. The greater part of this crop is shipped out of the country by way of Fort William or Port Arthur, where it is carried across the Great Lakes in boats specially built for the purpose. Two lines of railway, the Canadian Pacific and the Canadian Northern, connect Winnipeg with Lake Superior, and the branch lines of these two roads spread throughout the province. The main line of the Canadian Pacific cuts across Manitoba, while communication with the south is had by means of the Great Northern, the Canadian Northern, and the Canadian Pacific. The Canadian Northern has already direct connection between Winnipeg and Prince Albert, Battleford, and Edmonton,

and is to cross the Rocky Mountains through to the Pacific coast. The waterways of the province are as yet of little value, although considerable shipping is done on Lake Winnipeg. The new Grand Trunk Pacific will afford Manitoba another outlet to the East and also connect the province with the Pacific coast, while the Canadian branch of the Great Northern is rapidly pushing its way across Manitoba and the other western provinces also to the Pacific coast. The eastern terminals of this latter line are in Winnipeg.

Sporting. — Manitoba is celebrated as a resort for sportsmen. The principal native game bird is the prairie chicken, but during the summer and fall wild geese and ducks, plover and snipe, abound in all parts of the province. Deer, foxes, and prairie wolves, besides smaller animals, are found in the more unsettled parts of Manitoba.

FIG. 150.

A view in Winnipeg, showing the City Hall, Volunteer Monument, and one of the large commercial buildings.

Cities and Towns. — There are three cities in Manitoba, all of which have a great and growing importance. WINNIPEG, with a population in 1906 of 101,249, originally an old Hudson Bay fort, at the junction of the Red and Assiniboine rivers, is the capital of Manitoba and the leading city of the Canadian West, and is little more than thirty years old. It is almost equally distant from the Atlantic and the Pacific oceans, on the line of the natural routes of the great railways running east and west, and just at the entrance to the prairie section. To this situation it owes its importance as the great distributing point for the whole western country. Railways extend in all directions and more are being built each year. Winnipeg is the business, banking, railway, political, and educational centre of the province.

The Parliament Buildings (Fig. 151 *B*) are situated in Winnipeg, as are also the University of Manitoba, the Provincial Normal School, and the Provincial Institute for the Deaf and Dumb. The principal buildings, in addition to those already mentioned, are the City Hall (Fig. 150), Carnegie Library, Post Office, General Hospital, Land Titles Office, St. John's, Manitoba and Wesley Colleges, Manitoba Medical College, and, near at hand, the Government Agricultural College. The public school buildings of Winnipeg are the finest in Canada. The city has a large local trade and some manufactures, principally flour, soap, biscuits, iron goods, lumber, and dressed meats. The shops of the Canadain Pacific and Canadian Northern Railway give employment to several thousand men. The town of ST. BONIFACE, opposite Winnipeg on the Red River, is the seat of the French College of the same name and of the French Normal School for Manitoba. It has a woollen mill and several large brickyards.

FIG. 151.
The University of Manitoba.

PORTAGE LA PRAIRIE, on the main lines of the Canadian Pacific and Canadian Northern Railways, 56 miles west of Winnipeg, is an important railway centre. It has the further advantage of being placed in the midst of a rich agricultural country, with which it does a large local trade. The Provincial Home for Incurables and an Indian Industrial School are both situated at Portage la Prairie. The principal manufacture is flour.

FIG. 151 *A*.
The Collegiate Institute, Portage la Prairie.

BRANDON is beautifully situated on the south side of the Assiniboine River, about 130 miles west of Winnipeg. It is a railway

centre, and has a large local trade with the rich farming country round about. Brandon is the seat of one of the Provincial Asylums for the Insane, an Indian Industrial School, and Brandon College. Across the valley is the Dominion Experimental Farm. The principal manufactures are flour, machinery, woollen goods, and lumber.

The towns of Manitoba are not large, varying in population from 500 to 2500. They are for the most part engaged in grain or cattle business and local trade, but the volume of business they do greatly exceeds that of the average towns of the same size in eastern Canada. This is owing to the large area under cultivation around them. The Manitoba towns are just large enough to supply the wants of the surrounding farmers, while the whole business of the district passes through them. Each town has its elevators and its flour or saw mills, but there are few manufactures. The most important towns are WEST SELKIRK, at present the head of the Lake Winnipeg navigation. It has the Dominion fish hatcheries and large freezers for the fish trade. MORDEN has a large cement factory. BOISSEVAIN, DELORAINE, and SOURIS, in southern Manitoba, are large grain markets, while CARBERRY, VIRDEN, and OAK LAKE, on the main line of the Canadian Pacific, are the centres of a fine wheat country, and in northwest Manitoba, GLADSTONE, MINNEDOSA, DAUPHIN, BIRTLE, and RUSSELL are thriving towns. EMERSON and GRETNA, on the southern border, are Custom Ports of Entry. CARMAN, a little south of Winnipeg, is a large grain market.

FIG. 151 *B*.
The Government Buildings, Winnipeg.

Government. — Manitoba is governed by a *Lieutenant-Governor*, appointed by the Governor-General in Council, and a *Legislative Assembly* of forty members, elected by the people. There is also a *Cabinet*, or *Executive Council*, of five members, chosen from the party having the majority in the Legislative Assembly (Fig. 151 *B*). Manitoba is represented in the *House of Commons* by ten members, and in the *Senate* by four members. The province is divided into municipalities, each of which has its own local government. Matters affecting the relations of the municipalities are in the hands of the *Municipal Commissioner*.

IX. SASKATCHEWAN AND ALBERTA

Physiography.—The eastern portion of the province of Saskatchewan is part of the second prairie level. This has already been described in the section dealing with Manitoba. *See Pages 166 and 167.* Locate on the map, as accurately as you can, the second level, and note the rivers common to both provinces.

The western part of Saskatchewan, together with Alberta, is in the third prairie level. The eastern boundary of this level begins in the *Missouri Côteau*, a rough line of hills, thought by some to have been the shore of an ancient sea that has long since disappeared. It continues northward through the *Eagle Hills* along a line joining these hills with a point some distance west of the western end of Lake Athabaska. Trace this line on the map. The surface of the third level is on the whole a little more rolling than the others. The soil is often of the finest quality, the only exceptions being the cactus and sage-brush land a little to the southwest of the *Cypress Hills* (Fig. 153), and several other small districts, covered by sand-hills, or else of too hilly a nature to provide profitable pasture grounds for horses, cattle, or sheep. The southern portion, that is, the land of southwestern Saskatchewan and southern Alberta, is almost treeless. The northern and northeastern parts are generally wooded.

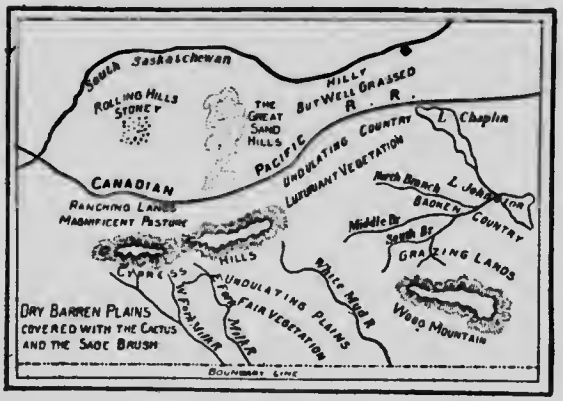


FIG. 153.

The plateau country of the Cypress Hills and Wood Mountain. This figure shows the varied nature of the country in this district.

Almost the whole of Saskatchewan and Alberta north of the fifty-fifth parallel is timbered, but in the region of the Peace River many fine prairie stretches are found. The prairies to the south of the wooded country are, on account of their fertile soil and delightful climate, exceedingly valuable for grazing purposes, while the wooded country is more suitable for fuel and lumber. Near the international boundary line the Rocky Mountains rise abruptly from the plain and often present to the east a wall of perpendicular rocks.

Fig. 15

Map Questions.—(1) Trace the boundaries of Alberta and of Saskatchewan. (2) Draw a map of the two Provinces, locating the watersheds and the larger lakes and rivers. (3) Compare the physical features of Alberta with those of Saskatchewan. (4) Compare eastern, western, and northern Alberta in regard to their surface. (5) Make a similar comparison between northern and southern Saskatchewan. (6) Trace care-

FIG. 152.

(2) and wan. Make care-

fully the course of the Saskatchewan River and its tributaries. (7) Show how Saskatchewan and Alberta are related by means of their river systems and the lines of railway. (8) Point out and describe the larger lakes of the two Provinces. (9) Locate the lines of railway, naming the most important places on each line. (10) Name and locate the principal cities and towns.

A short distance farther north, however, they become bordered or fringed by the foot-hills, and these continue, with varying breadth, at least as far north as the Peace River country.

A strip of plateau country south of the *Wood Mountain* and Cypress Hills forms a part of the Mississippi basin, and is drained south by the two forks of the Milk River and the White Mud River into the Colorado. The rest of the southern half of these provinces is drained by the Saskatchewan into Hudson Bay, through Lake Winnipeg and the Nelson River, while the northern portion is drained into the Arctic Ocean by the Athabaska and Peace Rivers, through the trunk stream, the Mackenzie.

Rivers. — The *North Saskatchewan* rises in the Rockies of western Alberta, flows northeast past Edmonton, turns southeast, and enters the province of Saskatchewan. At Battleford it receives the waters of the *Battle River*, a winding stream flowing in a deep valley. A short distance below Prince Albert it is joined by the south branch. The combined streams pour their waters into the northern end of Lake Winnipeg.

The *Mackenzie River* country, which includes northern Alberta and Saskatchewan and the district of Mackenzie, is worthy of attention, not only because of the immensity of the river basin, but also on account of the importance of the upper *Peace River* lands. In this district, though north of the fifty-fifth parallel, the land is so fertile and the climate so moderate that ranching and even mixed farming should become profitable occupations. Into what river does the Peace River drain?

The *Athabaska* rises in western Alberta, flows northeastward, and empties its turbid waters into *Lake Athabaska*. This lake, the first great expansion of the Mackenzie, is a beautiful sheet of water, over twice the size of Lake Manitoba, with its southern shore well wooded. The *Slave River* drains Lake Athabaska into *Great Slave Lake* in the district of Mackenzie, while it, in turn, is drained into the Arctic by the Mackenzie River. The Athabaska is navigable in long stretches, but its usefulness as a commercial highway is greatly lessened by several rapids. At the mouth of the river is a heavy rapid with a descent of 70 feet, but above this the main stream is navigable for river steamers for 900 miles. During most of its course the river flows in a narrow valley over 200 feet deep. For the last 280 miles, however, the river sweeps in a majestic stream down a broader and shallower valley.

The *South Saskatchewan*, over 800 miles in length, is formed by the union of the *Bow* and *Belly* Rivers. The Bow rises in the mountains beyond Banff, receives the *Elbow* at Calgary, and is joined by the Belly River in southeastern Alberta, whose tributaries are the *Little Bow*, the *Old Man*, and the *St. Mary's*. These streams are of great importance to the country, as supplying an easy means of irrigation in a region of deficient rainfall. The south branch flows east past Medicine Hat, is joined

by the *Red Deer* farther east, and finally pours into the north branch a stream 600 yards wide, which is navigable for 400 miles above its confluence.

Climate. — That part of Saskatchewan lying within the second prairie level has a climate quite similar to that of Manitoba.

Western Saskatchewan and Alberta, included in the third prairie level, have a greater elevation, and being under the influence of the Chinooks winds have a smaller rainfall. Besides making the climate drier, the general effect of these winds is to raise the temperature of southern Alberta and southwestern Saskatchewan, and in this way more than make up for what the third prairie level loses by reason of its extra height.

Between the prairie country and the Pacific lie the Rocky Mountains. The warm winds blowing over the Pacific from the southwest reach the colder and higher mountain country, where they are more or less chilled and made to give up the water they are carrying. How is this done? Afterward they work their way through the mountain passes and over the mountain tops, and descend to the plains to the east, over which they move as warm, dry winds, moderating the climate of a region several hundred miles in width. These are the *Chinooks*, so called from the Chinook Indians of southern British Columbia, over whose country the wind passes. The chinooks melt with remarkable rapidity any snow that falls. This is why it is possible for cattle to remain out all winter in southern Alberta, as the grass is never buried deep in snow. Throughout the whole of the prairie region the sky is clear, bright, and sunny, the air dry, the days of summer hot, and the evenings delightfully cool.

Ranching. — This is the great industry of southern Alberta and western Saskatchewan. The ranch country extends from the foothills toward the Missouri Côteau with CALGARY, LETHBRIDGE, MACLEOD, MAPLE CREEK, MEDICINE HAT, and BATTLEFORD as important centres. This region, where now are reared thousands of cattle, horses, and sheep (Figs. 154 and 155), was formerly the favorite haunt of the buffalo. The climate is so mild that cattle and horses can graze on the open plains all winter, while the prairies

FIG. 154.

are covered in the early spring and summer by a short but thick growth of the sweet, juicy buffalo grass, which becomes withered later on, but being cured by nature retains its nourishing qualities. Here, too, are many fine streams and springs, where excellent water may be had without the expense of digging wells.

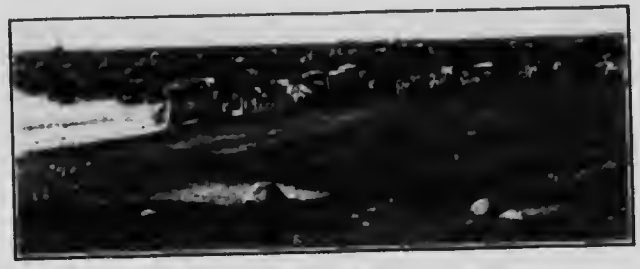


Fig. 155.

The rancher locates his house, with its few stockades or *corrals* and sheds, within easy reach of a stream. Why? If there is no neighbor within several miles, it is all the better, for his cattle are then more certain of abundant grass. Few fences are built, partly because it is necessary for the cattle to roam about at will in their search for food. A single ranchman may own from ten to twenty thousand head, and yet they are all allowed to wander upon the government land. Usually they keep within a distance of thirty miles of the ranch house: but sometimes they stray one or two hundred miles away.

Fig. 156.
Branding cattle.

Twice a year there is a general collection or *round-up*, the first occurring in May or June, and the other in early fall. One object of the first is to find the calves that have been born during the winter.

Since there are few fences, cattle belonging to ranches which are even a hundred miles apart become mixed during the winter, and those in a large herd may belong to a score of different ranchmen. Each cattleman has a certain mark or *brand* (Fig. 156), such as a letter, a cross, a horseshoe, or some other device, which must be burnt into the side of every cow; and that is the sole mark of ownership, and is everywhere respected.

Fig. 157.

A round-up, which lasts several weeks, is planned by a number of ranchmen together. A squad of perhaps twenty cowboys, accompanied

by a wagon and provisions, a large number of riding horses or "ponies," and a cook, go in one direction, and other wagons with similar outfits set out in other directions. Before separating in the morning, the members of a squad agree upon a certain camping place for the night, and then they scour the country to bring the cattle together, riding perhaps sixty or eighty miles during the day. Each ranchman knows his own cattle by the brand they bear, and since the calves follow their mothers there is no difficulty in determining what brand they shall receive. After branding the calves, each ranchman drives his cattle homeward to feed during the summer within a few dozen miles of their owner's home.

The second large round-up is similar to the first except that its object is to bring together the steers, and ship them away to market; it is accordingly called the *beef round-up*. What becomes of the stock raised on these immense pasture grounds? A great many cattle are shipped to the mining districts of British Columbia and the Yukon; many more are sent by train to the eastern and British markets, where they are in great demand.

More attention has been paid on the western ranches to horses and cattle than to sheep, but the raising of the latter is becoming an important industry. The same conditions that have made cattle and horse ranching so successful are also suited to sheep-raising, but the former pays better, and so has been given more attention. At present there are nearly one hundred and fifty thousand sheep on the ranches of the West (Fig. 157).

Agriculture. — The southern or prairie portion of Saskatchewan, particularly in the eastern part, and a large part of Alberta, are specially adapted to mixed farming, including grain-growing, cattle-raising and dairying. These two provinces, together with Manitoba, promise to form one of the greatest, if not the greatest, grain-growing area in the world. While portions of the country are more adapted to ranching, yet the introduction of irrigation on a large scale has rendered a good deal of land, formerly given over entirely to ranching, suitable for farming operations. There are at present over three hundred miles of irrigation canals in southern Alberta, and extensive additional works are in course of construction (Fig. 158). *See pages 169–171.*

FIG. 158.
An irrigation canal in Southern Alberta.

The principal crops are wheat, oats, barley, potatoes, and other roots. Much attention has recently been paid in southern Alberta to the growing of fall wheat, alfalfa, and sugar beets. A large factory for the making of sugar has been established at RAYMOND.

FIG. 159.

The Fur Trade. — On the more remote plains, woodlands, and unsettled regions of the north this is still an important industry. The whole of this northern region is covered by scores of Hudson's Bay Company's trading posts (Fig. 159), each of which is the natural centre of a fur trading district and all in touch with those points best located for receiving the raw furs for future shipment. Of the latter, ATHABASKA LANDING and EDMONTON are the great depots for the Mackenzie basin; PRINCE ALBERT and BATTLEFORD are the shipping points for the middle Saskatchewan and the country to the north. The furs are sent to England by steamer from Hudson Bay, or by train and steamship to the same destination.

FIG. 160.
Spruce forest near Prince Albert.

Lumbering. — Along the northern and middle Saskatchewan Valley lumbering is an important industry, and many saw-mills are in operation. The timber resources of northern Saskatchewan are practically inexhaustible, and as yet the industry is but in its infancy (Fig. 160). Spruce is the timber used in all these mills.

Mining. — The principal mineral found in Alberta and Saskatche-

wan is **coal**, although there are signs of many other valuable deposits. There are, it is said, fully 60,000 square miles of coal-bearing land in these two provinces. In Alberta coal is procured so readily that in certain places the rivers, by wearing their banks, have uncovered the seams, and the residents of the neighborhood have only to drive to the place, and load up all the coal they need. There are several varieties of coal found in this region, and these grade all the way from the lignite, or very soft coal, to the bituminous or harder coal, and even to the anthracite of the hardest variety. Lignite is mined at ESTEVAN, MEDICINE HAT, and at LETHBRIDGE; bituminous, among the foot-hills nearest the Rockies; and anthracite is mined near BANFF, and at CANMORE in the same district. At BLAIRMORE, in southwestern Alberta, coke is being manufactured for the first time in the North West.

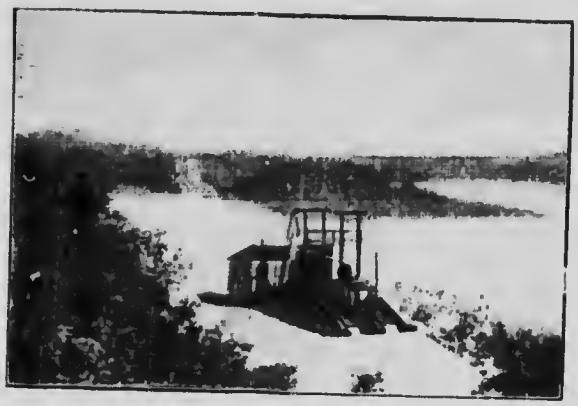


FIG. 161.
Dredging for gold in the sands of the Saskatchewan River.

All along the foot-hills of the Rocky Mountains, from the boundary to the far north, there are abundant signs of a bountiful supply of **petroleum**, sufficient, it is thought, to supply the whole continent with coal-oil.

Considerable quantities of **gold** are found in the sands and gravels of the northern Saskatchewan and Peace rivers and their tributaries, but the returns as yet have not been large (Fig. 161).

There are valuable quarries of **gray sandstone** near CALGARY, EDMONTON, and MACLEOD in Alberta. Besides these, a great abundance of granite boulders are found almost everywhere, much used for building purposes.

Manufacturing. — This industry is as yet in its infancy; but the abundant supply of coal and the water power supplied by the rapids of the numerous streams, are conditions which should render this an important industry in the future. Some wool is manufactured, and there are local flour mills at almost every village. At RAYMOND in southern Alberta a beet-sugar factory (Fig. 162), capable of working over four hundred tons of roots each day, is now in operation.

Transportation. — The navigable rivers have already been mentioned in connection with the drainage, and there is no doubt that these will be used more as the business of the West increases. Both

FIG. 162.
Beet-sugar factory at Raymond.

the Canadian Pacific and the Canadian Northern Railways have branches all through Saskatchewan and Alberta, and hundreds of miles of road are being added each year. The Grand Trunk Pacific, now in course of construction, will afford additional railway facilities in the northern section of the provinces.

CITIES AND TOWNS OF SASKATCHEWAN

REGINA, the capital of Saskatchewan, is on the main line of the C.P.R. nearly midway between Winnipeg and Calgary. Branch lines connect with Saskatoon and Prince Albert on the north, and with Arcola on the southeast. The city is therefore finely located as the market and wholesale centre of the surrounding country. It is also the educational centre for the province, the Normal school being situated here.

FIG. 163.
Court-house, Regina.

PRINCE ALBERT is finely situated on the North Saskatchewan a short distance above the junction of the river with the south branch. Around it is an extensive agricultural country that of late has been rapidly developing. It has saw-mills, flour mills, grain elevators, and brickyards.

Indian Head is in the centre of a great wheat country, as are also the neighboring towns of Qu' Appelle and Sintaluta. About a mile to the north of Indian Head is the government Experimental Farm. The town has a large flour mill, planing-mills, sash and door factory, and elevator accommodation necessary for the surrounding district (Fig. 164).

Fig. 164.
Grain elevators at Indian Head.

Yorkton, on the Yorkton branch of the Canadian Pacific Railroad, is in the midst of a fine rolling country well wooded in parts. Here the government has established a creamery. Yorkton is also an important cattle shipping centre.

Saskatoon, an important distributing point on the Prince Albert Branch of the Canadian Pacific Railway, is the centre of a large farming country. Both the Canadian Northern and the Grand Trunk Pacific will probably pass through or near Saskatoon.

Moose Jaw, on the main line of the Canadian Pacific Railroad, is a railway centre, being a divisional point on the main line, and also a terminal point of the Soo branch, which runs southeast from Pasqua eight miles east of Moose Jaw through Estevan to the boundary line at Portal, where connection is made with the Soo line to St. Paul. From an agricultural point of view, as well, Moose Jaw is one of the most flourishing cities in the province.

Cities and Towns of Alberta

Edmonton, the capital of Alberta, is on the north bank of the North Saskatchewan. Its command of the upper Mackenzie and Saskatchewan valleys will, there is no doubt, raise it before many years into a great railway and manufacturing centre. The country round about is rich in coal, in wood, and all the products of the farm. Alberta College is situated here. The town is at present connected with Calgary by a branch of the Canadian Pacific Railway, and with Winnipeg and Port Arthur by the Canadian Northern. On the opposite bank is situated the flourishing town of Strathcona, connected with Edmonton by a steel bridge. South of Strathcona on the Calgary-Edmonton branch are Wetaskiwin, Lacombe, Red Deer, Innisfail, and other towns, all centres of large farming interests.

CALGARY is a very progressive city, situated in western Alberta, at the junction of the Bow and Elbow rivers, 840 miles from Winnipeg and 640 miles from Vancouver, on the border-line between the great farming and ranching country of Alberta and the mining and lumbering regions of British Columbia. It is a divisional point on the Canadian Pacific Railway, has branch lines running to Edmonton and Macleod, and is the seat of the Western Canada College, and of the Provincial Normal School. It is an important commercial centre.

Lethbridge, on the Crow's Nest Railway, is situated in the centre of large coal-fields, farming and ranching lands. The mines here give employment to several hundred persons, and supply soft coal to southern Alberta. Lethbridge is the terminus of the Alberta Railway and Coal Company's line, running south to the boundary line. From Lethbridge a magnificent view of the Rocky Mountains may be had.

Macleod, on the Crow's Nest Pass Railway, lies a short distance west of Lethbridge at the southern terminus of the Calgary-Edmonton branch of the Canadian Pacific Railway. It is an important centre of the ranching industry in southern Alberta.

Medicine Hat, on the south branch of the Saskatchewan, is the centre of a great ranching district. Near it are extensive coal-fields.

Banff. — Eighty miles west of Calgary, on the main line of the Central Pacific Railway, is Banff, the centre of a large tract of country full of magnificent mountains, lovely lakes, and shady trees. This district has been set apart by the Dominion Government as a great national park to be used for purposes of pleasure and recreation only.

In southern Alberta are STIRLING, CARDSTON, and RAYMOND in a district made more valuable for grain, cattle, and vegetables by an elaborate system of irrigation ditches. Near the mountains southwest of Macleod are the famous ranches of PINCHER CREEK, now growing smaller as the settlements devoted to mixed farming are extending.

The whole western portion of Canada is growing so rapidly that it is almost impossible to give any very accurate description of the cities and towns. New settlements, which in a short time become flourishing towns, are constantly being formed. The centre of population of Canada promises soon to be west of the Great Lakes.

Government. — Both Alberta and Saskatchewan have a *Lieutenant-Governor*, appointed by the Governor-General in Council, a *Legislative Assembly* of twenty-five members elected by the people, and a *Cabinet*, or *Executive Council*, chosen from the members of the Legislative Assembly. Each province is represented in the Dominion Parliament by five members of the *House of Commons* and by four members of the *Senate*.

THE NORTH-WEST TERRITORIES

The district lying north of Ontario and Manitoba and extending to the Arctic Ocean, bordering on the east Hudson Bay, was formerly known as **Keewatin**. This whole section is as yet almost wholly unexplored, except by the hunter and the trapper. The *Nelson River*, the outlet of Lake Winnipeg, the *Hayes River*, and the *Churchill* are well-known streams to the Indian and the hunter. The southern portion of the country consists of one long continuation of rocky heights, beautiful lakes, and forest-covered stretches, intersected with numerous rapid streams. The central portion, in the vicinity of the Churchill River, is somewhat similar, but the northern part lies almost wholly within the "barren lands." In the short spring and summer season it is anything but barren, for the earth is covered with myriads of flowers, and the air is full of insect and bird life; but in the winter nothing could be drearier than these wind-swept plains. But little is known of these rolling, marshy, mossy plains, and what little we do know has come largely from those who have had to bear every kind of peril and suffering in their efforts to make known a few more of the dark places of the earth. The region is said to be rich in minerals. At present the only inhabitants, in addition to the fur traders, are Eskimos and Indians. YORK FACTORY and FORT CHURCHILL are important trading posts.

The district comprising the northern portion of the Labrador peninsula, north of the province of Quebec, except the eastern strip of coast, was formerly known as **Ungava**. The western coast is rocky, indented by many inlets, and skirted by a large number of rocky islands. The interior is a gently undulating plateau. The main watershed, which extends north and south about the centre of this section, causes the country to be drained westward into Hudson Bay and eastward into the Atlantic. On the *Hamilton River* are the Grand Falls, where the stream leaps three hundred feet over a bluff into a narrow gorge. The country is more or less sparsely wooded as far north as Ungava Bay, beyond which the country is treeless. The only inhabitants, except a few white fur traders, are Indians and Eskimos.

The district consisting of the Arctic Archipelago was formerly known as **Franklin**. The islands vary in size from Baffin's Land down to small reefs. Some very good seams of coal are found on

various islands. The surface is in general low and is similar in character to the "barren lands" of the continent. In this region of Arctic night the polar bear, reindeer, and musk-ox have as yet a safe retreat. The Eskimos are the only inhabitants. The peninsula of Boothia, which forms a part of this district, contains the magnetic north pole.

The section of country lying to the west of the old district of Keewatin was formerly known as **Mackenzie**. The northeastern corner lies within the area of the "barren lands," beyond the limit of the growth of trees, while most of the remainder is covered with a forest of stunted spruce and larch of little commercial value. Along the *Bear River*, however, and along the *Mackenzie*, for some miles below the mouth of the Bear, is a magnificently timbered region. The whole district has a gentle and fairly regular slope northward to the Arctic Ocean. The most notable breaks in the general level are the high cliffs on the north shore of Great Slave Lake, and the Copper Mountains near the *Coppermine River*.

FIG. 165.
The ramparts of the Mackenzie.

The great artery of this district is the *Mackenzie*, "the king of northern rivers," 1000 miles long and with an average width of a little over a mile. The waters of the three large lakes, *Athabaska*, *Great Slave*, and *Great Bear*, drain into it, while one of its tributaries, the *Liard*, rises within 150 miles of the Pacific. Some distance below the mouth of the Bear River are the Upper Ramparts, a remarkable gorge (Fig. 165). For some distance above the Ramparts the river is unusually wide, but here it narrows to about 500 yards, and bending to the east runs for three or four miles between huge walls of solid rock varying from 125 to 250 feet above the water.

At present the furs secured by the Indians throughout the forests are the principal source of wealth. Fish abound in the lakes and streams and furnish valuable supplies of food for the traders and the Indians. It is said, however, that mixed farming can be made a profitable industry as far north at least as Great Slave Lake, this

being no farther north than portions of Russia where agriculture is carried on successfully. The country is also rich in minerals, **coal, petroleum, natural gas,** and **salt** being known to exist; but as yet little accurate information is to be had.

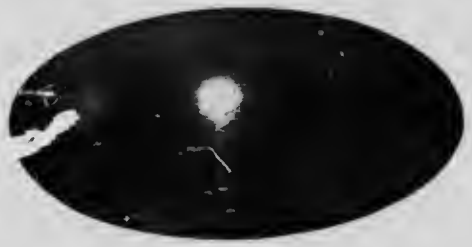


FIG. 166.
The midnight sun. From a photograph taken on the Arctic Circle at midnight by Mr. C. W. Mathers of Edmonton.

With the exception of the fur-traders and mounted police, this section is without white inhabitants. A number of devoted missionaries also make their homes in these northern wilds, passing from trading-post to trading-post in pursuit of their calling. FORT GOOD HOPE, on the Arctic Circle, and FORT MACPHERSON, still farther north, are trading-posts of the Hudson's Bay Company.

QUESTIONS AND SUGGESTIONS

THE DOMINION OF CANADA.—(1) Locate on the map the various countries of North America. (2) Estimate roughly the size of each and compare. (3) Who is the owner of each of these countries? (4) Point out on the map the nine provinces and five territories of Canada and give the boundaries of each. (5) Estimate the size of each and compare. (6) When and under what circumstances did each enter confederation? (7) Trace on the map the most important railways in Canada. (8) Describe the government of Canada. (9) In what relationship does Canada stand to Great Britain? (10) Is there anything in the situation of Ottawa that makes the city specially suitable as the capital of Canada?

ONTARIO.— (1) Draw an outline map of Ontario, showing its relation to the other provinces. (2) Using the scale on the map, estimate the size of Ontario and compare it with the other provinces. (3) Upon what large bodies of water does Ontario touch? (4) What is the importance of each of these to the province? (5) Give a brief sketch of the surface of Ontario. (6) Compare the climate of Toronto with that of Ottawa. That of Hamilton with Sudbury. (7) What are the most important influences on climate in the province? (8) Why is not more wheat grown in Ontario? (9) Describe the stock-raising industry. (10) Why is Ontario specially suited to dairying and hog raising? (11) Locate on the map the counties more particularly engaged in stock raising and dairying? (12) Describe the fruit districts of Ontario. (13) Where is tobacco grown in the province? (14) What is the importance of the growing of sugar-beets? (15) Give a brief account of a lumber camp. (16) How is paper made from wood? (17) Locate the lumbering regions. (18) Tell all you can about the mining and manufacturing of iron. (19) What other minerals are found in Ontario and where? (20) What is the importance of nickel? (21) Tell all you can about the manufactures of the province. (22) Tell about the fisheries. (23) What field does Ontario offer for the sportsman? (24) Describe fully the waterways of Ontario. (25) Draw a sketch of the Great Lakes. (26) Trace on the map the leading

railways. (27) Locate on the map the principal cities and tell some facts about each. (28) Locate the leading towns and tell why each is of importance. (29) Locate on the map the leading summer resorts and tell the advantages of each. (30) How is Ontario governed? (31) Tell what you can about education in Ontario.

QUEBEC. — (1) Draw a sketch map of Quebec. (2) Show the importance of the St. Lawrence River to the province. (3) Describe the surface of the country. (4) Describe the leading rivers, particularly the Saguenay. (5) Describe the location of the city of Quebec. (6) Compare the climate with that of Ontario. (7) Tell about agriculture in Quebec. (8) Locate the principal centres. (9) Tell about making maple syrup. (10) Why are the French Canadians such expert lumbermen? (11) Is lumbering an important industry in Quebec? Why? (12) What minerals are found in the province and where? (13) What are the leading manufactures? (14) Is Quebec well provided with railways? (15) Tell about the summer resorts and the sporting. (16) Describe the cod fishing. (17) Give a full description of Quebec and Montreal, and tell why they are of importance. (18) Locate on the map the leading towns. (19) Note where each is situated. (20) Describe the government of Quebec.

NOVA SCOTIA. — (1) Trace on the map the coast-line of Nova Scotia. (2) Locate the principal coast waters. (3) Describe the surface. (4) Give a description of the diked lands. (5) Tell what you can about the tide rivers. (6) Tell about the tides in the Bay of Fundy. (7) Compare the climate of Nova Scotia with that of Quebec. (8) Tell about the fisheries of the province. (9) Locate the principal coal-fields and describe the process of mining. (10) What part does iron manufacture play in the development of Nova Scotia? (11) Tell about agriculture, more particularly the growing of apples. (12) What is the importance of the lumber trade? (13) What are the leading manufactures? (14) Tell about the railways. (15) Is Nova Scotia noted as a summer resort? (16) Locate these summer resorts on the map. (17) Describe Halifax harbor. (18) Locate the leading cities and towns. (19) How is Nova Scotia governed?

NEW BRUNSWICK. — (1) Describe the coast-line. (2) Give a brief description of each of the leading rivers and trace the course of each on the map. (3) For what is each noted? (4) Describe the climate. (5) Tell about agriculture in the province. (6) Describe the lumbering industry. (7) What are the most important minerals? (8) Is fishing a leading industry? Why? (9) Tell about the manufactures and railways. (10) Locate and describe St. John, Fredericton, and Moncton. (11) Tell about "the Bore." (12) Locate the most important towns, and tell why each is important. (13) How is New Brunswick governed? (14) Point out the leading summer resorts.

PRINCE EDWARD ISLAND. — (1) Describe the surface, coast-line, and climate of the island. (2) How is the island separated from the mainland? (3) How is communication maintained in summer? In winter? (4) What are the leading industries? (5) Is the island noted as a summer resort? Why? (6) Point out the leading cities and towns. (7) How is the island governed?

BRITISH COLUMBIA. — (1) Give a full description of the surface of British Columbia? (2) What are the leading ranges of the western mountains? (3) Locate the most important passes through the mountains. (4) Trace on the map the leading rivers and describe each? (5) Give some account of the scenery. (6) Mention the various climate belts, and describe the climate in each belt. Why the difference? (7) Describe lumbering in British Columbia. What are the most important trees? (8) Tell about fishing. (9) Tell what you can about the salmon industry. (10) Tell about sealing. (11) What is the importance of

mining in the province? (12) Tell about agriculture. (13) What are the leading highways? (14) Describe the location of Vancouver, Victoria, and New Westminster. What is the importance of each? (15) Point out on the map the principal towns, and note carefully the location of each. (16) How is the province governed?

YUKON. — (1) Describe the surface. (2) Compare the climate with British Columbia, Ontario, and Nova Scotia. Why the difference? (3) Tell about gold mining. (4) Locate on the map the principal districts and towns. (5) Tell about the government of the territory.

MANITOBA. — (1) Locate on the map the three prairie levels. Describe each and estimate its area. (2) What part of Manitoba is on the first prairie level? (3) Describe the part of Manitoba on the second prairie level. (4) Locate on the map the principal rivers and lakes and briefly describe each. (5) Compare the climate of Manitoba with that of Ontario. (6) What is the principal industry? Why? Tell about the elevator system of the province. Describe the plan of survey. (7) Tell about the other industries of the province. (8) Trace on the map the leading railways. (9) Describe the city of Winnipeg. (10) Point out the leading towns. (11) How is the province governed?

SASKATCHEWAN AND ALBERTA. — (1) Describe the surface of Saskatchewan. Of Alberta. (2) Draw a sketch of the third prairie level. (3) Tell what you can of the foot-hills of the Rocky Mountains. (4) Describe the most important rivers and trace each on the map. (5) Compare the climate of Alberta with that of Saskatchewan. (6) Describe fully a western ranch and ranching operations. (7) Why is ranching of so much importance? (8) Tell about agriculture. (9) Describe an irrigation canal. (10) What is the value of irrigation. (11) Tell about the other industries. (12) Describe the leading cities and towns and locate each on the map. (13) Are the provinces well provided with railways? (14) How is each province governed?

THE NORTH-WEST TERRITORIES. — (1) Make a sketch map of this section, locating the rivers and lakes. (2) Describe the surface of the country. (3) Tell about the Mackenzie River. (4) What is meant by "the Midnight Sun"? (5) What is the importance of this part of Canada?

SUGGESTIONS. — (1) Read up the history of Canada and find out about the Confederation movement in Canada, and when and how each of the provinces became a part of Canada. (2) Obtain a railway map of Canada, either from the Department of Railways at Ottawa or from any one of the transcontinental lines, and trace the various railways in Canada. Note particularly the route followed in each case. (3) Obtain from the Interior Department at Ottawa, from the Immigration Departments of each of the provinces, and from the leading railway and steamship companies, illustrative matter relating to Canada, and make a collection of these pictures. Classify the pictures in the most convenient way. (4) Describe the various parts of Canada that you have visited and with which you are familiar. (5) Visit all the leading manufacturing establishments in your neighborhood, and keep an account of what you have seen. (6) Make a collection of such manufactured articles as you can easily obtain, and the raw material from which the article is manufactured. (7) Read descriptions of mining, fishing, lumbering, and other industries. (8) What stories have you read that deal with the life of men engaged in these occupations? (9) Hunt up in the dictionary or other reference book pictures of the more important animals, birds, and fishes in Canada. (10) Make a collection of pictures of this kind. (11) Draw a map of Canada, and locate the position of the most important mines. (12) Find out all you can about the waterways of Canada, and why each is important.

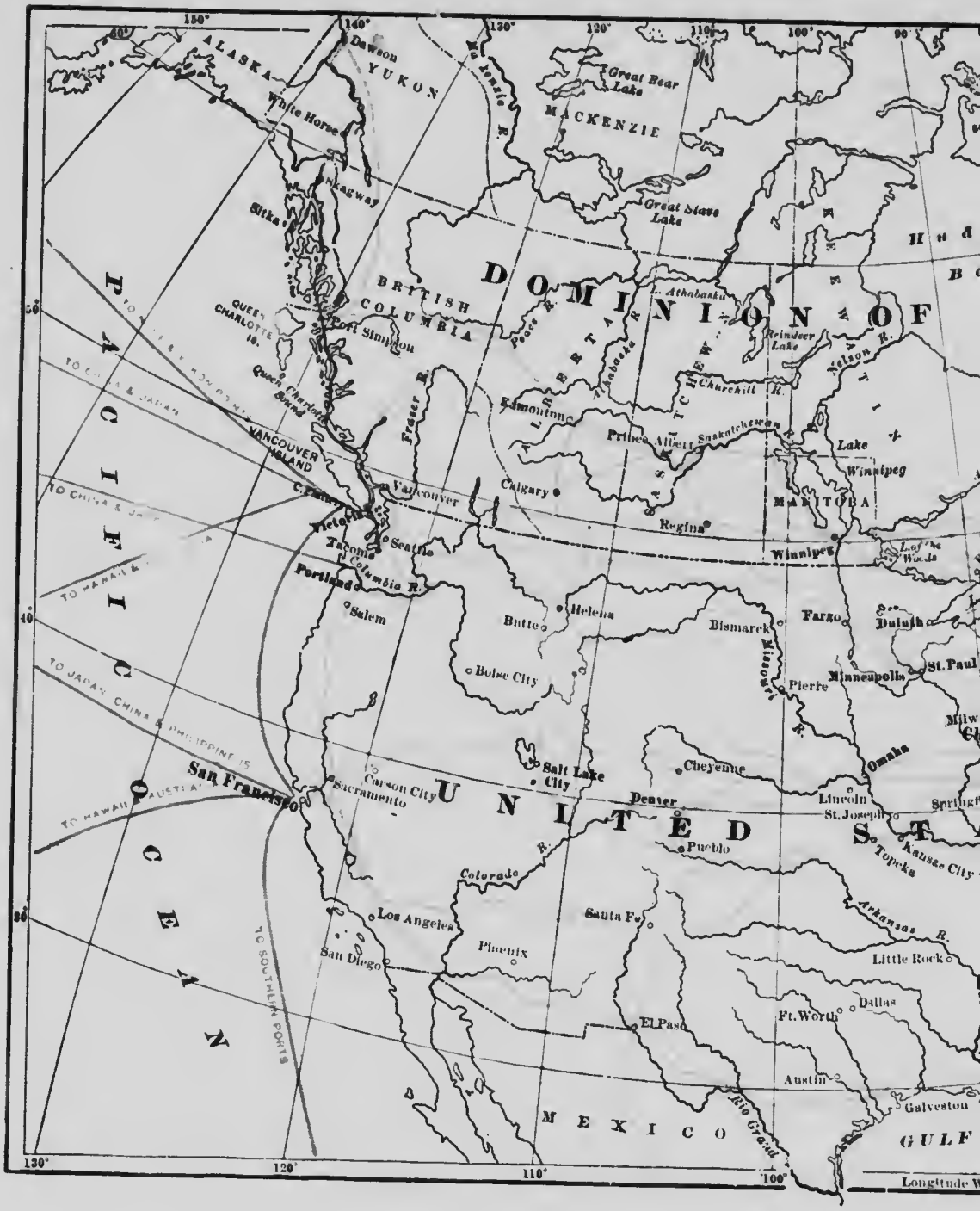
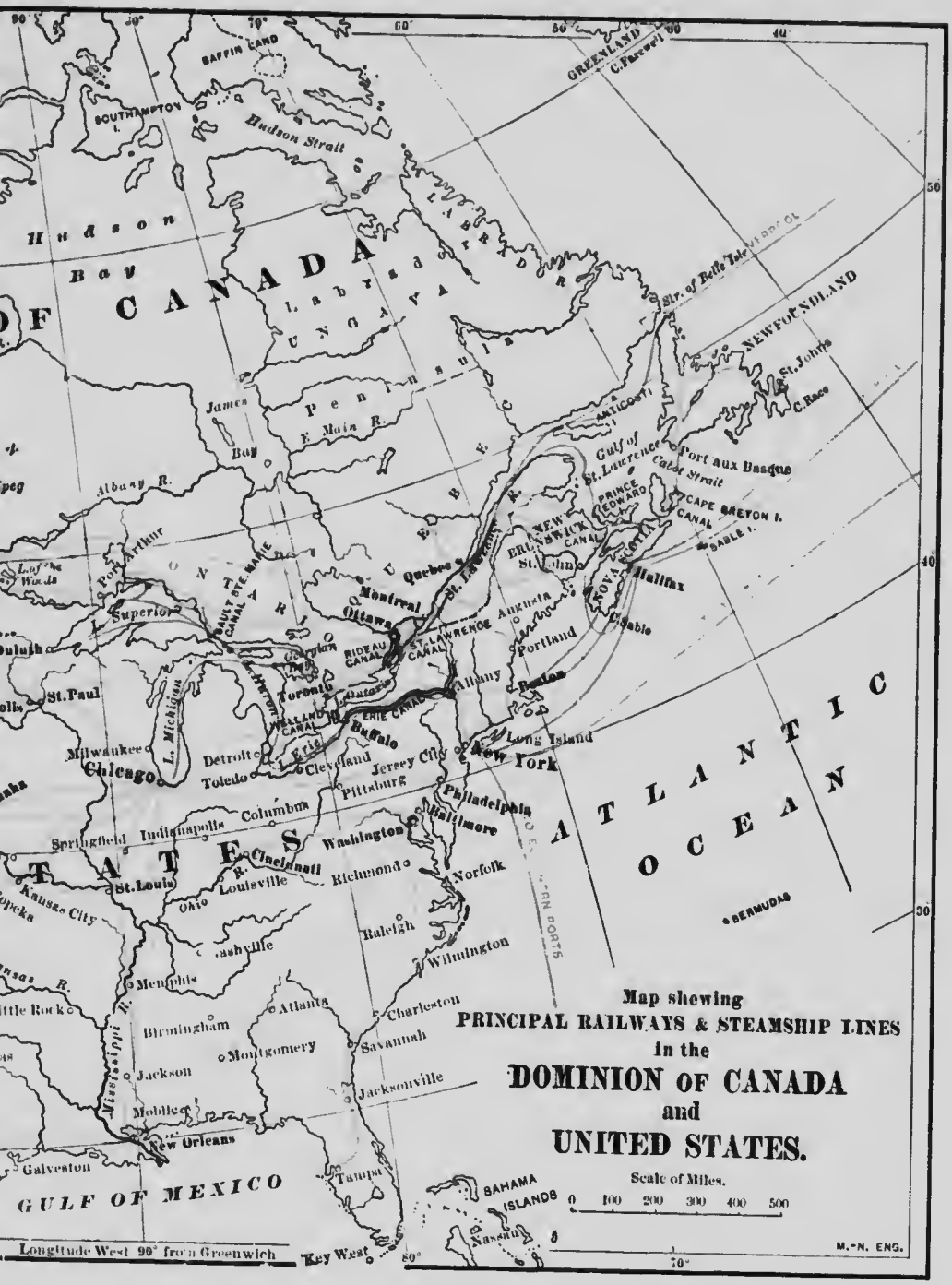


FIG. 167.

MAP QUESTIONS.—(1) Trace the trans-continental lines across Canada and the United States. (2) Estimate the extent of territory served by each of these lines. (3) Trace the steamship lines connecting North America with the other continents. (4) Trace the steamship lines through the Great Lakes and the River St. Lawrence. (5) Compare the railways of Canada with those of the United States, with regard to the territory through which each passes, and the steamship lines with which they connect. (6) From



the map, show the relations of the railways to the steamship lines. (7) Show how the trans-continental lines of railways are connected by other railway lines. (8) Compare Montreal with New York as a railway terminus. Compare Vancouver with San Francisco as a shipping point. (9) From the map point out the advantages of the St. Lawrence as a shipping route. Compare this with a route from Europe to the west shore of Hudson Bay. (10) Locate and name the principal harbors in North America.

IV. NEWFOUNDLAND

Map Questions. — (1) What shape is the island? (2) What is its greatest length? (3) What is its greatest breadth? (4) Point out the coast waters. (5) Point out the largest peninsulas. (6) Name the largest bays and inlets. (7) Compare the latitude of Labrador with that of England.

History. — Newfoundland was discovered in 1497 by John Cabot. Various attempts were made to colonize the island, but with little success. From 1792 the island began to increase in population and to make some progress, and in 1832 constitutional government was conceded. From that time progress has been steady, although affairs were for many years complicated by the French Shore Difficulty. By the Treaty of Utrecht the French were allowed equal rights with the British on the shores of parts of the island. This equal right caused a great deal of friction, but by an agreement recently entered into between the French and British governments the trouble has been removed. Up to the present time Newfoundland has refused to enter the Canadian Confederation, preferring to retain her independence as a separate colony.

Coast-Line and Physiography. — The coast-line of Newfoundland is very irregular, the indentations both large and small being numerous. The total length of coast-line following the indentations is said to be over 2000 miles. Most of the larger bays, such as *White*, *Notre Dame*, *Bonavista*, *Trinity*, and *Conception*, are on the northeast side of the island, although *St. George Bay* and the *Bay of Islands* on the west are large and important. The peninsula of *Avalon* on the southeast extremity is connected with the mainland by an isthmus only three miles across, while there is a smaller peninsula, *Buron*, on the south. The character of the coast is bold and rugged, and there are numerous rocky islands.

The surface is also very irregular, although at no point does the elevation exceed 2000 feet. The plateau on the west of the island, about 1000 feet in height, is known as *Long Range*. The interior has not been fully explored, but the higher parts are covered with forests. In spite of the irregularity there is a large amount of

arable land and also a wide extent of country covered with valuable timber. There are many small lakes; indeed, it is said that the lakes form one third of the surface of the island. The rivers are numerous but small and of little use for navigation. The *River of Exploits*, about 200 miles in length, and the *Humber*, are the largest.

Climate. — On account of its peculiar location, and the influences of the Gulf Stream and the Arctic Current, the climate is subject to sudden changes. On the whole the climate is healthy, and not so severe as in Quebec and Ontario. The winter sets in about the beginning of December and lasts until the middle of April, the temperature varying from 80° in summer to a little below zero in midwinter. Dense fogs occasioned by the meeting of the Gulf

FIG. 168.
Scene on the Labrador coast. Curing fish in summer.

Stream and the Arctic Current are prevalent in the south and southeastern parts, but are unknown on the west coast and in the interior of the island.

Fishing. — The great industry of Newfoundland is fishing, over one-quarter of the inhabitants being engaged in the catching and curing of fish (Fig. 168). No other country in the world is so abundantly supplied along its shores with fish. About one thousand vessels owned on the island, in addition to numerous smaller craft, are engaged in the fisheries. The principal fish is the **cod**, although **herring**, **salmon**, **haddock**, and other fish are also caught. Lobster fishing is becoming an important industry, there being many canneries along the coast. The rivers are filled with salmon.

The GRAND BANKS are situated about 100 miles from the coast. They are elevations of the bed of the ocean, and extend about 600 miles in length

by about 200 miles in width. The average depth of the water is 250 feet. The cod come in summer to these shallow banks in search of food, and there they are caught by the fishermen with capelin, herring, and squid, the food of which they have come in search. The Grand Banks are without the jurisdiction of Newfoundland, and any one can fish there, but the bait is caught inshore along the coast. This privilege of catching and selling bait is a very valuable one, and is jealously guarded by the Newfoundland fishermen. Most of the cod caught is dried and exported. As in Quebec and Nova Scotia, the greatest care is taken to waste no portion of the fish. Every part is of value. *See Page 124.*

Sealing. — Each year large masses of ice are brought down around the coast of Newfoundland by the Arctic Current. On these ice-floes are thousands of seals, who have sought this refuge for the

FIG. 169.

Newfoundland sealers killing seals on the floe ice off the coast of Labrador.

purpose of bringing up their young. About twenty steamers and twelve thousand men are engaged in the business of sealing. The vessels set out about the 12th of March, when the young seals are in the best condition, and make their way in among the floes, killing the seals with clubs (Fig. 169). Only the blubber and skins are of use. The occupation is dangerous, but profitable, for those engaged in it.

Lumbering. — There is much valuable lumber in Newfoundland along the rivers and bays, but the industry has not yet been developed. The principal trees are pine, spruce, fir, tamarack, birch, ash, and maple.

Agriculture. — Farming does not form one of the leading industries. There is much valuable land, but as yet agriculture has not been attempted on anything like a large scale. The principal crops are barley, oats, and vegetables.

Mining. — Newfoundland gives promise of being rich in minerals. **Coal** in large quantities has been discovered south of St. George Bay, and in other parts of the island. **Copper, Lead,** and **Iron** are found in considerable quantities. Immense deposits of **Gypsum** exist in St. George Bay. **Asbestos** and **Petroleum** have also been found in small quantities. With sufficient capital to develop these properties, mining promises to be one of the leading industries.

Manufactures. — There are few manufactures, and these only of local importance, and many of them connected with the fisheries. The principal, in addition to those already mentioned, are twine, nets, ropes, and leather.

FIG. 170.
View of the harbor of St. John's, Newfoundland.

Game. — Newfoundland is rich in game, especially caribou, which are found in large numbers in the interior. Wild geese and ducks and ptarmigan are plentiful, while trout are abundant in the streams. The island is attracting more and more attention as a resort for sportsmen.

Transportation. — Newfoundland is connected with the mainland of the continent by various lines of steamers. About 650 miles of railway are in operation, and building is being rapidly extended.

Cities and Towns. — The cities and towns of Newfoundland are not numerous. The chief city and capital of the island is ST. JOHN'S, situated on the east side of the Avalon peninsula, opening on the Atlantic (Fig. 170). The harbor is entered by a deep gap between

high cliffs. The chief industry is connected with the fishing, the principal article of commerce being fish. The government buildings are at St. John's, but the chief buildings are the Roman Catholic and Anglican Cathedrals, two of the most beautiful churches on this continent. Other towns are HARBOR GRACE, CARBONEAU, TWILLINGATE, BONAVISTA, and HEART'S CONTENT. This latter is the landing place of a number of Atlantic cables.

Government. — The government of Newfoundland, which also includes a large strip along the coast of Labrador, is in the hands of a *Governor*, appointed by the British government, a *Legislative Council* of fifteen members appointed by the Governor in Council, and a *Legislative Assembly* of thirty-six members elected by the people. The *Executive Council*, at the head of which is the *Premier*, is chosen from the party that has the majority in the Legislative Assembly. The government is similar to that of Quebec and Nova Scotia.

LABRADOR, THE FRENCH ISLANDS, AND GREENLAND

Labrador. — A strip of country along the shore of Labrador, about 700 miles in length, is under the government of Newfoundland. The coast is similar to that of the island, and the inhabitants, in addition to the Indians and Eskimo, are mostly fishermen and trappers. The climate is severe in winter, and the shortness of the summer season and the frequent frosts render the cultivation of the soil almost impossible. About one-fourth of the total catch of fish of Newfoundland comes from Labrador. The interior has not as yet been explored to any extent. The most important river is the **Hamilton**, about 600 miles in length, and noted for its magnificent falls and cataracts.

The French Islands. — These are two islands near the coast of Newfoundland that belong to France: **Miquelon** and **St. Pierre**. The inhabitants are almost all engaged in the fisheries.

Greenland belongs to Denmark, and there are a few trading stations maintained there by the Danes. The most important is UPPERNAVIK, where a considerable trade in skins, walrus ivory, blubber, and eider down is carried on.

QUESTIONS. — (1) Sketch briefly the history of Newfoundland. (2) Tell what you can of the French Shore Difficulty. (3) Mention the more important bays and rivers. (4) Describe the coast-line. (5) Describe the interior of the

island. (6) How does the climate compare with that of Canada? (7) What effect has the Gulf Stream on the climate? (8) Describe the Grand Banks. (9) Why is fishing such an important industry? (10) Describe a Newfoundland sealing expedition. (11) Tell what you can of the other industries. (12) Describe the harbor of St. John's. (13) Tell what you can about Labrador. (14) Of what importance are the French Islands? (15) To what nation does Greenland belong? (16) What are the principal exports of Greenland?

SUGGESTIONS. — (1) Obtain a large railway map of Newfoundland and locate the coast-waters, the principal towns, and the railways. (2) Find out all you can about the fishing on the Grand Banks, and its seal catching. (3) Find out about the fogs on the Banks of Newfoundland. (4) Find out about the Atlantic Cable. (5) Find out all you can about the Hamilton River. (6) Why do the French attach so much importance to the small islands owned by them? (7) Describe the life of a white trader in Greenland.

FIG. 171.

MAP QUESTIONS.—(1) Trace the boundaries of the United States. (2) From the map, estimate the area of the country, and the distance across the widest part. (3) Compare the western with the eastern highlands. (4) Trace the course of the Mississippi River and its chief tributaries. (5) Compare the rivers of the eastern with those of the western coast. (6) Trace the eastern, western, and southern coast-lines, naming the harbors, b
lakes othe
(9) Draw
out and na

71.

harbors, bays, capes, and islands. Compare these coast-lines. (7) Locate the principal lakes other than the Great Lakes. (8) Locate the mining and agricultural districts. (9) Draw a map of the United States, filling in the various States by groups. (10) Point out and name the principal cities, giving reasons for the location of each.

V. THE UNITED STATES OF AMERICA

History. — In 1785, at the conclusion of the Revolutionary War, Great Britain acknowledged the independence of the thirteen colonies, and in addition gave up the rich country lying between the Mississippi and the Great Lakes. Soon the tide of migration had passed the Appalachians, and thousands of settlers poured into the fertile valley of the Mississippi. This territory was further extended by purchase, conquest, or international agreement, until at present the part of the continent lying between Canada on the north and Mexico and the Gulf of Mexico on the south, belongs to the United States. Alaska, Porto Rico, and the Hawaiian Islands are also United States territory. The original thirteen states have now grown to forty-six states and three territories, and the population from a little over three millions to nearly eighty millions. A war with Great Britain in 1812–14, a war with Mexico, a disastrous Civil War (1861–65) between the northern and southern sections of the country, and a war with Spain, are the chief incidents in the history of the United States. *See also Page 450.*

Government. — The United States is a federal union composed of states and territories and is governed by a *President* and *Congress*. The President is elected every four years by *Electors* chosen for this purpose by the people of each state. Should he die during his term of office he is succeeded by the *Vice-President*, who is elected at the same time as himself. The President is assisted in his work of administering the affairs of the nation by a *Cabinet* appointed by himself, but each member must be confirmed by the Senate. This Cabinet differs from the Canadian Cabinet in that its members are not dependent upon the popular branch of the legislature, but are responsible to the President alone, and may be dismissed by him at any time at his own pleasure. Congress consists of two branches, the *Senate* and the *House of Representatives*. The Senators are elected for a term of six years by the state legislatures, each state being entitled to two members. The Representatives are elected for two years by the people, the number being based on the population of the state. All laws, in order to go into effect, must pass both the Senate and the House of Representatives, and receive the assent of the President:

but a law may be passed over the veto of the President, provided that two-thirds of the members of each house vote in its favor when it is again submitted. Each state has a legislature of its own, modelled after that of the federal government. It consists of a *Governor*, a *Senate*, and a *House of Representatives*, the members being known as State Senators and State Representatives. All matters respecting the United States are dealt with by the federal government, while those which more intimately concern the individual states are under the control of the state legislatures.

The capital is Washington, where is the White House, the official residence of the President, and the Capitol, where the federal Congress meets (Fig. 172).

FIG. 172.
The National Capitol at Washington.

A plan similar to that adopted in the case of Canada will be followed in dealing with the United States. The country is so large, its soil and climate so varied, its resources so vast, and its population so widely dispersed, that it is impossible to treat it other than in sections. The division into New England, Middle Atlantic, Southern, Central, and Western states is based on historical, physiographical, and climatic grounds. Locate these divisions on the map of the United States. Alaska and the Hawaiian Islands are also treated in this chapter.

The United States is honeycombed in all directions by railways and waterways, and these are constantly being added to and developed. The more important of these are noted in connection with the various sections. Trace on Fig. 167 the transcontinental lines.

I. THE NEW ENGLAND STATES

(Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut)

Physiography and Climate. — The sinking of the coast has made the shore-line extremely irregular, thus forming many good harbors. The great glacier from the north has left its traces everywhere. By damming the streams and turning them from their courses, it has caused many lakes, falls, and rapids. The rocky surface of the country, with bare ledges and boulder-strewn soil, and, indeed, the very soil, itself, have also been caused by the glacier.

While low near the coast, the land rises rapidly toward the north and west and becomes a plateau crossed by river valleys, the bottoms of which are several hundred feet below the plateau top.

Fig. 173.

A view across the upland of New England, with Mt. Monadnock rising in the background. Describe this view.

The upland near the coast has been so cut by many valleys that the surface is studded with low hills. But in the west, the higher upland, known as the *Berkshire Hills*, is quite mountainous.

Other mountains, in some cases where the rocks are hard, rise above the plateau. Some of these, like *Mt. Monadnock*, in southern New Hampshire (Fig. 173), rise singly. Others, like the *White Mountains* of New Hampshire, are in groups, and still others, such as the *Green Mountains* of Vermont, form irregular ranges. Many of the mountain peaks reach from 3000 to 4000 feet above sea-level, but *Mt. Washington*, in New Hampshire, is nearly 6000 feet in height.

The northern part of the New England states has a climate resembling that of Quebec, while the southern part, tempered by the warm,

south winds off the Gulf Stream, which here is only a hundred miles off the coast, has a less rigorous climate.

Lumbering.—This is an important industry in Maine, New Hampshire, and Vermont (Fig. 174). The logs, cut in autumn and winter, are floated down the innumerable streams, swollen by the melting snows, to the many saw and paper mills, which are mostly located at tide-water. Around these saw and paper mills large cities have grown up, such as BANGOR on the Penobscot, WATERVILLE and AUGUSTA on the Kennebec. BATH, at the mouth of the latter river, is noted for its shipbuilding, and PORTLAND, the largest city in Maine, exports large quantities of lumber.

FIG. 174.
Lumbering in the Maine woods.

Paper mills, using rags as well as wood-pulp, are found at WATERVILLE, GARDINER, WESTBROOK, and other places. HOLYOKE, the greatest paper-making city in New England, is situated in the midst of the busy cities of Massachusetts. There the paper is generally made from rags, which produce a finer grade of paper. The neighboring cities assure a large supply of the necessary rags.

Quarrying. — There are three kinds of stone that are especially valuable in New England; namely, granite, marble, and slate, each of which is quarried in large quantities.

Granite. — One of the oldest granite quarries in the country is at QUINCY, near Boston, and buildings made of Quincy granite over two hundred years ago may still be seen in Boston. Other granite quarries are found in and near GLOUCESTER, Massachusetts, BARRE, Vermont, CONCORD, New Hampshire, and along the coast of Maine.

Marble. — The most noted marble quarries in the United States are near RUTLAND, Vermont. This stone is so much softer than granite that it may be sawed without being blasted. It is much used for

DOMINION OF CANADA
QUEBEC
NEW BRUNSWICK
MAINE
Murray Bay
St. Lawrence
Quebec
Levis
Three Rivers
Mattawin R.
St. Maurice R.
Chaudière R.
Sherbrooke
St. John
Caribou
Houlton
Heron L.
Moosehead Lake
Penobscot R.
Kennebec
Bangor
Oldtown
Bucksport
Belfast
Augusta
Hallowell
Gardiner
Waterville
Fairfield
Skowhegan
Farmington
Rumford Falls
Paris
Auburn
Lewiston
Richmond
Rockland
Androscoggin
Rangeley Lakes
Saddleback Mt.
Mt. Abraham
Mt. Washington
N. Conway
Littleton
Berlin
Lancaster
St. Johnsbury
Montpelier
Barre
Stowe
Winooski
Burlington
St. Albans
Swanton
Lake Champlain
Adirondack Mountains
Randolph
Machias
Calais
Bar Harbor
70°
72°
74°
68°

.. 173.

MAP QUESTIONS.—(1) Name the States of this group. (2) Point out the capital of each. (3) Locate the mountains and the most important rivers. (4) Point out the three largest lakes. (5) Locate the principal capes, bays, and islands on the coast. (6) Point out and name the largest cities. (7) Compare the locations of the more important cities. (8) What relations do the States of this group bear to Quebec and to New Brunswick? (9) What waters of the New England States flow into Canada? (10) Estimate the area of the New England States as a whole and of each State.

buildings, statues, and monuments. Like granite, it may be given a high polish.

Slate. — Slate is quarried in several parts of New England, as in eastern Maine, western Massachusetts, and Vermont. The value of slate is due largely to the fact that it splits or cleaves so easily that it is readily broken into thin slabs with a smooth surface. In this way it is made into roofing slate, school slates, slate pencils, slabs for wash-basins, etc.

Fishing. — A very important industry of New England is fishing. Near the coast fish are now much less abundant than formerly, but since they are still found farther out from the shore, hundreds of vessels and thousands of men are engaged solely in catching them. GLOUCESTER, which is a centre for that industry, is the greatest fishing port in the United States, but BOSTON and PORTLAND also have an important fish trade. Mackerel, halibut, cod, and lobsters are the chief varieties. *See page 124.*

Agriculture. — So much of the New England states is hilly or mountainous and so strewn with boulders that farming is not so important an industry as in many other parts of the United States. By no means all the food that is needed can be raised in this section, much grain and meat having to be brought from the Mississippi Valley and elsewhere. And since the southern portion of this part of the country is thickly dotted with cities, where the people are engaged in other occupations, there is a ready market for whatever food the farmers can supply. Many of the farmers are engaged in raising various kinds of vegetables, as tomatoes, corn, potatoes, etc., and sending them to the nearest town to be sold. Selling milk to the neighboring towns and cities is also an important source of revenue to the New England farmer. In the more hilly parts, where the soil is poor, and no market is near, many of the farms have been abandoned, and houses and barns are tumbling down.

Manufactures. — The rivers of New England abound in waterfalls (Fig. 176), which furnish such excellent water-power that this region early became, and is yet, one of the most important manufacturing sections of the whole country. Its many large cities owe their existence chiefly to this industry. Hundreds of articles are made, those composed of cotton, wool, leather, and metal being the most important.

Cotton. — There are about 400 cotton mills in New England. As many as 1200 persons, three-quarters of whom are women, are frequently employed in a single mill. Most of the cotton is brought from the Southern states, but some of it comes from Egypt.

Wool Manufacturing. — Much of the wool that is manufactured into cloth in the New England states is obtained from Ohio and other states farther west. Large quantities of wool are also imported from Australia. The chief cities engaged in the cotton and woollen industries are, in Maine, LEWISTON and AUBURN; in New Hampshire, MANCHESTER and DOVER; in Massachusetts, LOWELL, LAWRENCE, and FALL RIVER; in Rhode Island, PAWTUCKET and PROVIDENCE. There are besides many more smaller places engaged in the industry.

FIG. 176.

A waterfall that supplies power to some factories in one of the smaller manufacturing towns of New England.

Leather Manufacturing is carried on extensively in LYNN, HAVERHILL, and BROCKTON, in Massachusetts.

Metal Manufacturing. — The lighter articles, as jewellery, clocks, needles, cutlery, tools, and firearms, that require a high degree of skill, are the chief articles manufactured from metal in New England. For instance, WORCESTER is noted for its wire and iron goods; PROVIDENCE for its jewellery; NEW HAVEN for hardware and firearms; HARTFORD and SPRINGFIELD produce firearms and bicycles; WALTHAM, near Boston, and WATERBURY are noted for watches and clocks.

The Large Cities. — Most of the large cities are on the coast. PORTLAND, the largest city in Maine, has an excellent harbor, and is the eastern terminus of the Grand Trunk Railway. NEW HAVEN is the largest city in Connecticut; PROVIDENCE is the largest city in Rhode Island, while BOSTON is the largest in New England. All these are on the coast. BURLINGTON, the largest city in Vermont, is on Lake Champlain.

Boston, with a population of nearly 600,000, is the fifth city in the United States, and is surrounded by many large cities, such as CAMBRIDGE, the seat of Harvard University; CHELSEA, MALDEN, and SALEM. It has an excellent harbor, and is a great railway and manufacturing centre. The port of Boston is second in importance in the United States. NEW HAVEN is the seat of Yale College,

Summer Resorts. — To the dwellers in the crowded cities of New

England the wooded mountains, the silvery lakes and rivers, and the rocky sea-coast offer many and varied attractions. Tens of thousands flock each summer to these places to spend their vacation.

While great numbers visit the woods, mountains, and country, many go to the sea-shore to bathe in the salt water or to row and sail. Almost the entire coast of New England is dotted with summer cottages and hotels.

Among the many seaside resorts may be mentioned BAR HARBOR in Maine, NANTUCKET ISLAND and MARTHA'S VINEYARD farther south, while NEWPORT, on Narragansett Bay, is one of the most fashionable watering places on the coast. PORTSMOUTH on the Maine coast has a large navy yard.

II. THE MIDDLE ATLANTIC STATES

(NEW YORK, NEW JERSEY, PENNSYLVANIA, DELAWARE, MARYLAND, VIRGINIA, AND WEST VIRGINIA)

Physiography and Climate. — The Appalachian Mountain ranges and plateaus, with their stores of coal and iron, extend across these states from northeast to southwest. Just east of the mountains is a low hilly plateau of hard rock, called the Piedmont Plateau. This region is really a worn-down mountain land like New England; in fact it represents the very roots of those mountains which rose above the sea long before the Coal Period. The land slopes seaward, and the streams flow in short courses in the same direction.

Nearer the sea-coast the country is a low plain of softer rocks, chiefly sands and clays that were deposited on the sea bottom and then raised to form dry land. These plains, added to the country not many years ago, are known as the coastal plains.

FIG. 177.

The fall line. Coastal plains dotted, Piedmont and other sections left white. Cities printed in heavy type are located along the fall line.

The line which separates the *Piedmont Plateau* from the coastal plain is called the *fall line* (Fig. 177). Here occur rapids and falls because the streams dig more rapidly into the softer layers of the coastal plain than into the harder rocks of the Piedmont Plateau. Since the rapids and falls determine the place where boats, passing upstream, must stop, and also where there is water-power, the earlier settlers located their villages on the *fall line* as the

Indians had done before them. Note how many large cities are on this line (Fig. 177). Name them.

Many rivers, such as the *Mohawk*, *Delaware*, *Susquehanna*, *Potomac*, and *James*, have cut deep water-gaps through the mountains, affording a comparatively easy route to the fertile western plains beyond.

On the western side of the Appalachians, there is a plateau, sloping gently toward the Ohio and Mississippi rivers, called the Appalachian Plateau. Near the mountains in West Virginia and Pennsylvauia the plateau is so deeply cut by rivers that in many cases they have cut down to the coal beds, and brought the coal to light.

Owing to the fact that the glacier did not spread over the southern part of this group of states, few lakes and waterfalls are found. But they abound in New York, northern New Jersey, and Pennsylvania, which the glacier did cover.

In the Middle states, as in New England, the sinking of the land has produced numerous large bays and fine harbors, through which the tide often reaches far inland. In the Hudson River, for example, the tide extends above Albany.

While the climate of the northern portion of this group of states resembles that of New England, the climate of the southern portion is much warmer. Its greater warmth is due partly to the lower latitude, and partly to the ocean currents. The cold Labrador Current does not extend south of Cape Cod; but the Gulf Stream passes very near the Virginia coasts.

The climate is so mild in Virginia that sleighing and skating are rarely possible, while places near the entrance of Chesapeake Bay — as OLD POINT COMFORT and NEWPORT NEWS — are important winter resorts. Among the mountains, however, the climate is cooler; and even as far south as Virginia and North Carolina there are cool summer resorts on the mountain sides.

The rainfall averages about thirty-five inches a year, which is sufficient for crops and for dense forests. Because of its climate and products, the region is well fitted to support a dense population.

Lumbering. — There are extensive forests both in the Adirondack and Appalachian mountains. WILLIAMSPORT in Pennsylvania is extensively engaged in the lumber business; there are also many paper mills supplied from the forest, as in WATERTOWN near the Adirondacks.

Fishing. — Fishing is a much less important industry than in New England, shad being the principal fish caught. Oysters are found all along the coast; but one of the best localities for them

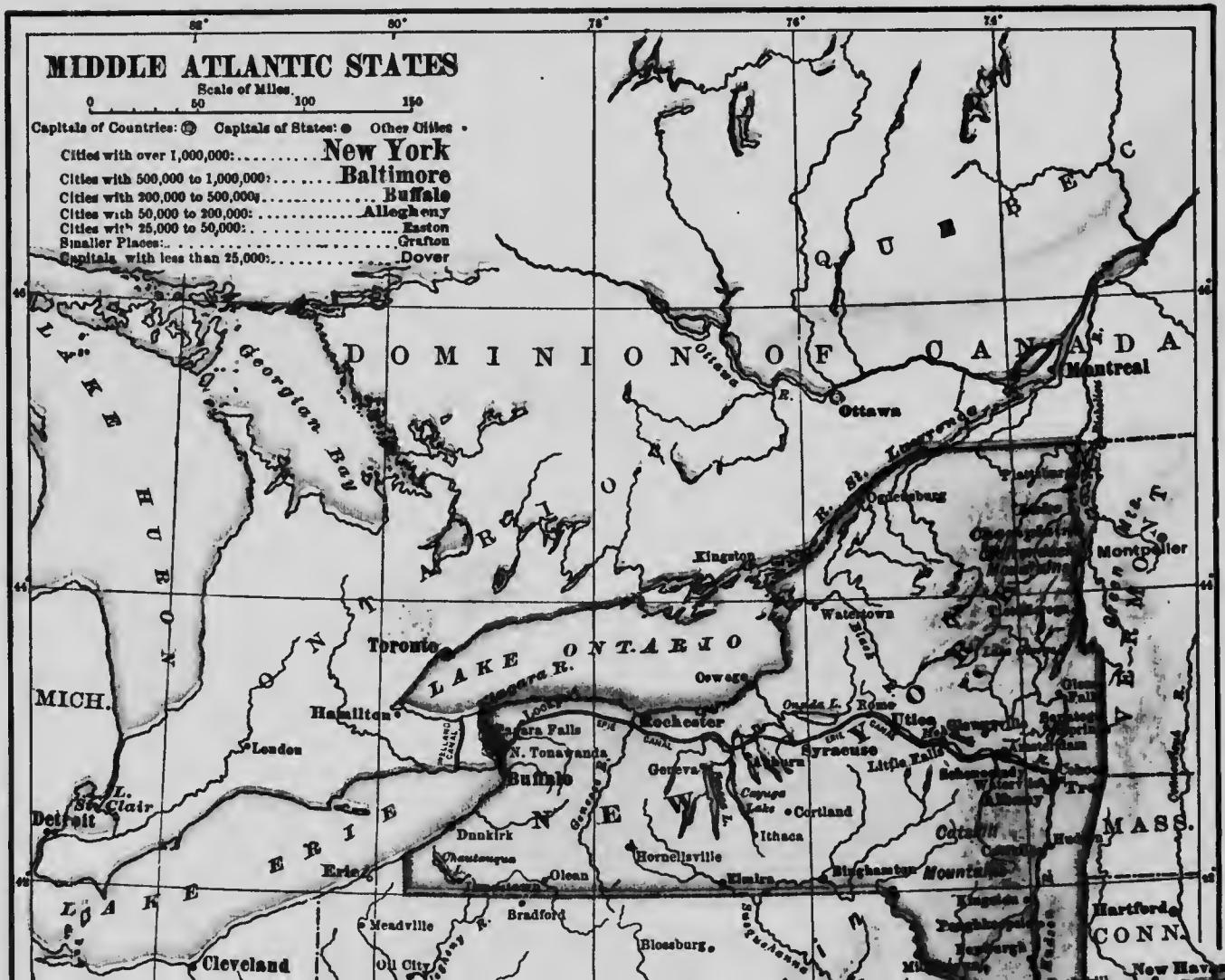

MIDDLE ATLANTIC STATES
Scale of Miles
0 50 100 150
Capitals of Countries: Capitals of States: Other Cities
Cities with over 1,000,000: New York
Cities with 500,000 to 1,000,000: Baltimore
Cities with 200,000 to 500,000: Buffalo
Cities with 50,000 to 200,000: Allegheny
Cities with 25,000 to 50,000: Easton
Smaller Places: Grafton
Capitals with less than 25,000: Dover
DOMINION OF CANADA
QUEBEC
Montreal
Ottawa
Ottawa R.
R. St. Lawrence
Ogdensburg
Kingston
Watertown
Montpelier
Toronto
LAKE ONTARIO
Niagara R.
Oswego
Rome
Utica
Syracuse
Rochester
Niagara Falls
N. Tonawanda
Buffalo
Geneva
Auburn
Little Falls
Schenectady
Albany
Cortland
Ithaca
Hamilton
London
MICH.
L. St. Clair
Detroit
Dunkirk
Chautauqua
Olean
Hornellsville
Elmira
Binghamton
Catskill Mountains
MASS.
Erie
LAKE ERIE
Meadville
Bradford
Blossburg
Cleveland
Oil City
Hartford
CONN.
New Haven

FIG. 178.

MAP QUESTIONS.—(1) Name the States of this group and locate the capital of each. (2) Estimate the area of the Middle Atlantic States as a whole and of each State. Compare the area of the various States. (3) What States border on Lakes Erie and Ontario? On the Atlantic Ocean? (4) Point out the principal mountains and rivers. (5) Draw a map of the Atlantic Coast, locating the most important bays. (6) Compare Chesapeake Bay with Delaware Bay. (7) Compare the locations of New York, Baltimore, and Philadelphia. (8) Locate the most important mining and manufacturing districts. (9) Trace the Erie Canal. (10) Point out the principal cities and towns.

is Chesapeake Bay, where the waters are warm and quiet. From this region they are collected in great quantities. BALTIMORE and NORFOLK are especially noted for the oyster industry.

Agriculture. — Owing to the large areas of fertile land in these states, agriculture in all its branches is carried on successfully. The numerous large cities call for quantities of vegetables and small fruit, and so there is much *truck farming*.

Many farmers turn their attention chiefly to *dairying*. Although butter and cheese are made in every state of the Union, the industry is especially important in New York. UTICA on the Mohawk River is an important cheese market; and scattered all over New York are small cheese and butter factories. These are of great value to the farmers, since they furnish a ready market for their milk.

Tobacco. — Among the plants which the early explorers found in America was the tobacco (Fig. 179). The newcomers quickly learned to smoke the leaves of this plant, and tobacco soon became one of the leading products shipped to Europe. Now its use extends through the whole world. The state most noted for its production is Virginia. In the vicinity of LYNCHBURG and DANVILLE, where much tobacco manufacturing is carried on, immense quantities are raised; and RICHMOND and PETERSBURG are among the great tobacco markets of the world.

FIG. 179.
The tobacco plant.

The tobacco plant grows to a height of about three and a half feet, and has thick leaves which are large and broad, somewhat like those of the rhubarb. The leaves, which are the valuable part of the plant, are plucked in the fall, hung in a drying room, and then made into some form for use.

Fruits and Vegetables. — Owing to the fertile soil and suitable climate, fruit is raised nearly everywhere. *Apples* form an important fruit crop in New York, especially along the southern shores of Lake Ontario. So much fruit is cultivated in this state that the *nursery business* is greatly developed, especially at ROCHESTER.

On the coastal plain and Piedmont Plateau, grapes, berries, especially strawberries, and other fruits, flourish. One of the most noted fruit belts is the Chautauqua grape belt on the southern shores of Lake Erie in western New York.

The *canning* of fruit and vegetables for winter use has become an important industry in many cities, as in BALTIMORE and WILMINGTON.

Mining is one of the most important industries in the Middle Atlantic states. Thousands of men are employed in the mines and millions of dollars invested.

Salt is mined extensively south of SYRACUSE and ROCHESTER. Indeed, **New York** produces more salt than any other state in the Union.

Coal. — The coal swamps that existed millions of years ago stretched westward from the ancient Appalachian Mountains beyond the Mississippi. In some places the coal has been entirely washed away. In others it is sometimes found close to the surface and sometimes several hundred feet beneath it (Fig. 180). Most of this is soft or *bituminous* coal, which is mined in enormous quantities in the neighborhood of PITTSBURG and ALLEGHENY.

FIG. 180.
A view in a coal mine in Pennsylvania.

In two or three places, however, in Pennsylvania hard, or *anthracite*, coal is found, the chief centres being WILKES BARRE and SCRANTON. It is to the coal that these cities owe their importance.

Anthracite coal was first made in the same way as soft coal. Had it not been subjected to the pressure caused by the mountain folding, it would doubtless have formed a bituminous coal; but the pressure has changed it by driving off the gases that form a part of all woody matter. These changes have made the coal harder and more difficult to burn; but since it gives forth a more intense heat than bituminous coal and burns with less smoke, it is preferred for some purposes, such as heating and cooking.

Petroleum and Natural Gas. — Petroleum is found in the plateau along the northwestern border of the Appalachian Mountains. Near the oil wells cities have grown up, such as BRADFORD and OIL CITY in Pennsylvania and OLEAN in New York. No region in the world furnishes so much oil as western Pennsylvania, West Virginia, and eastern Ohio. The only section of the world that approaches it is in Russia near the Caspian Sea.

As soon as an opening is made through the rock by boring into it, the gas which is associated with petroleum rushes forth and is conducted

away in pipes. This gas is used for lighting and heating, as well as for fuel, in factories in many cities and towns, especially in BUFFALO and PITTSBURG.

Iron. — Pennsylvania and West Virginia enjoy a great advantage in having within their borders an abundance, not only of coal, but also of oil and gas, for fuel. Iron is also found in Pennsylvania, Virginia, and other states. Thus both the raw material and the fuel necessary for manufacturing it into useful articles are found almost side by side. It is easy to see, therefore, that one of the principal industries of this section must be connected with iron. Indeed, almost every city in the Middle Atlantic states is engaged in iron work of some kind, some in making iron and steel out of ore, others in manufacturing iron and steel goods. For example, in New York BUFFALO manufactures car wheels, machinery, and many other articles. In NEW YORK CITY almost all kinds of iron goods are made. Iron and steel goods and bicycles are manufactured in SYRACUSE, and there are iron foundries in BINGHAMPTON, ELMIRA, and SCHENECTADY.

In Pennsylvania, PHILADELPHIA manufactures steel ships, cars, and hundreds of other iron goods; PITTSBURG and ALLEGHENY make steel and iron goods of nearly every kind; and SCRANTON, READING, HARRISBURG, ERIE, ALTOONA, and a score of other places have furnaces, foundries, and machine shops. In New Jersey, JERSEY CITY, NEWARK, CAMDEN, and HOBOKEN manufacture iron goods. In Delaware, WILMINGTON is noted for its cars and steel ships. In Maryland, BALTIMORE has a great variety of iron manufactures. WHEELING in West Virginia and ROANOKE in Virginia are also engaged in iron manufacturing.

FIG. 181.
A potter's wheel in the works of the Trenton Potteries Company.

Glass, Pottery, Bricks, etc. — Glass is manufactured at and near PITTSBURG, WHEELING, and many other places. In and near TRENTON, New Jersey, there is a kind of clay which may be manufactured into pottery of a very high grade, and pottery making has become an important industry in that city (Fig. 181). Brickyards are found near every large city.

Largest Cities and Chief Shipping Ports. — NEW YORK, with a population of nearly 4,000,000, is second only to London among the great cities of the world. Near it are JERSEY CITY, HOBOKEN, NEWARK, ELIZABETH, and PATERSON, which, as far as their busi-

ness relations are concerned, form a part of New York. Before its union with New York, the great city of BROOKLYN on Long Island was fourth among the cities of the country. That such a vast

FIG. 182.
Brooklyn Bridge in New York City.

number of people have collected in one section is due in part to the excellent harbor, and the ease with which goods may be sent westward into the interior both by water and by rail. The tide reaches up the Hudson above ALBANY, and the Erie Canal extends from there westward to BUFFALO on Lake Erie.

The Erie Canal, which is over 350 miles long, follows the easiest route westward from the Hudson, the route used by the Indians before the white men came. Since the canal is only 70 feet wide and 7 feet deep, all the freight coming from the West in Lake steamers, and intended for the canal, must be unloaded at Buffalo and placed in *canal boats*. These clumsy-looking boats are made with broad, flat bottoms, in order that they may carry heavy loads without sinking deep into the water. They are drawn by horses or mules that walk along the *tow-path* at the side. Before the Erie Canal was built, Philadelphia was larger than New York, while Buffalo was only a small village; but since the completion of the canal in 1825 both the latter cities have grown rapidly, while numerous other cities along the Hudson and the canal have attained great importance.

FIG. 183.
New York City elevated railway skirting the border of one of the city parks.

New York is not only the greatest *shipping port* in North America, having more than half the foreign trade of the country, but, together with

the neighboring cities, the greatest *manufacturing centre* as well. The wholesale trade of New York is enormous. At the southern end of Manhattan Island, on which much of New York is built, there are eight square miles of the city given up wholly to it. The city contains some magnificent public buildings. Central Park, in the heart of the city, is about one thousand acres in extent.

PHILADELPHIA. — Like New York, this city is surrounded by other important cities, as TRENTON and CAMDEN in New Jersey, CHESTER and MORRISTOWN in Pennsylvania, and WILMINGTON in Delaware. The Delaware is navigable for ocean vessels as far as Philadelphia. It is, therefore, a great *shipping point*, especially for coal. Like New York, it is a great *railway centre*, and, having coal and iron near by, it is also a great *manufacturing centre*. The city is especially famous for *carpets*.

BALTIMORE. — At the head of Chesapeake Bay in Maryland is the beautiful city of Baltimore, the sixth in size in the United States. Since it has a good harbor, and is connected with the West by railways, and also has access to the coal-fields of Pennsylvania and West Virginia, Baltimore has become a noted manufacturing city and shipping port. It is the seat of Johns Hopkins University. A few miles south at ANNAPOLIS is the United States Naval Academy.

WASHINGTON, on the Potomac in the District of Columbia, is the capital of the United States. Here are the Departmental Buildings and the residence of the President.

RICHMOND, the largest city in Virginia, is at the head of tide-water on the James River. It is, therefore, an important shipping point, as is NORFOLK, on the coast. A great deal of cotton is shipped from both these cities.

III. THE SOUTHERN STATES

(NORTH CAROLINA, SOUTH CAROLINA, GEORGIA, FLORIDA, ALABAMA, MISSISSIPPI, TENNESSEE, ARKANSAS, LOUISIANA, TEXAS, AND OKLAHOMA)

Physiography and Climate. — Almost the entire area included in this group of states is made up of plains. The most level portions are the delta and flood plain of the Mississippi, and the coastal plains that skirt the entire Gulf and Atlantic coast of the Southern states. The coastal plains are very level; and, since the rainfall is heavy,

they are often swampy, especially near the rivers. Their higher portions are more irregular and better drained; but since the soil is sandy, there are large areas which are too barren for agriculture, and are, therefore, still covered by an open pine forest.

The Piedmont Plateau, at the eastern base of the Appalachian Mountains, has a good drainage and excellent soil, so that it is the seat of extensive agriculture, especially cotton and tobacco raising.

As in Pennsylvania and West Virginia, there is a rough plateau west of the Appalachians. This plateau is deeply cut by river valleys, and is so rugged that it is still covered by extensive forests, and has few inhabitants. Still farther west are the broad and fertile plains of the Mississippi Valley and of Texas.

FIG. 184.

A view in the mountainous section of the extreme western part of Texas.

In western Texas the plains rise until they become high plateaus, reaching an elevation of 4000 to 5000 feet near the base of the spurs of the Rocky Mountains, which extend into Texas (Fig. 184).

The coast-line is much more regular than that of New England. Sand-bars, built by waves and tides, have in many cases blocked the entrance to the shallow harbors. The waves throw up the sand in banks, and the winds pile it still higher, forming sand-dunes along the shore.

In southern Florida countless millions of coral polyps live in the warm waters of the Gulf Stream. These little insects have built the limestone rock which forms the southern part of the Florida peninsula, and also the many reefs and small islands or *keys* which lie just south of Florida.

The low plains of the Southern states lie so far south that the climate is everywhere warm; and the damp winds from the Gulf bring an abundant rainfall to them. These conditions make it possible to raise cotton, sugar-cane, and rice. In southern Florida semitropical and even tropical fruits are easily raised.

The Southern winter is mild, like spring and autumn in the North. Consequently many Northern people go South to spend the winter at such resorts as JACKSONVILLE and ST. AUGUSTINE. The latter, founded in 1565, is one of the early Spanish settlements.

Western Texas, being too far from the sea to be reached by the damp winds from the Gulf, has a very dry climate, fitted only for ranching. Between this arid belt and the warm coastal plains is a plain and prairie region with extensive cotton fields.

Lumbering. — Extensive areas in the Southern states are timber covered, and among the forests are found many trees unknown in the North, such as the magnolias. On the sandy coastal plains grows the hard or *Georgia* pine, much used for flooring in the North. It is shipped North from CHARLESTON, MOBILE, and other coast cities.

On the plateaus and among the mountains grow the oak and other hardwood trees. From MEMPHIS, Tennessee, large quantities of this hardwood is shipped to northern points.

FIG. 185.
Negroes picking cotton.

From the Southern pine turpentine is obtained, while the chestnut oak yields tannic acid, used in tanning leather.

Agriculture. — In the Southern states, with their excellent soil and warm moist climate, *agriculture* is the principal industry. Tobacco raising, already described as an industry of great importance in Virginia, is also extensively carried on in Tennessee and North Carolina. CLARKSVILLE in Tennessee and DURHAM in North Carolina are centres for this industry.

Cotton. — The crop in the South that surpasses every other in value is cotton. As in the days of slavery, most of the negroes still make their living by working in the cotton fields, for cotton is the principal crop from North Carolina to Texas (Fig. 185).

In 1898 the Southern states produced 11,000,000 bales of cotton, each weighing nearly 500 pounds. In the same year the entire world produced a little over 17,000,000 bales, which makes it clear that the United States produces at present much more than half of all the cotton grown.

Cotton requires rather fertile soil and a long warm summer with an abundance of rain. These conditions exist in the Southern states. The seeds are planted in the spring, in rows about three feet apart, and the weeds are kept out until the plants are nearly grown. They reach a height of about three feet, and develop large blossoms that produce a pod, in which the cotton and cotton seeds are contained. On maturing, the pods burst open, revealing a white woolly ball known as *cotton*, which in appearance resembles the downy substance in the thistle and in the pod of the milkweed. When a great number of these pods have split open, a cotton plantation of five or six hundred acres presents a beautiful sight, — much like a field flecked with snow (Fig. 185). Then the busy season for the pickers begins. As many as two or three hundred negroes — men, women, and children — may assemble in one field, carrying bags and picking cotton, singing melodies, and chattering in the negro dialect the livelong day. When plucked from the pods the cotton is attached to seeds, and these must be removed before the cotton can be of use. The seedless cotton is tightly pressed into bales of about 500 pounds, which are then covered with coarse jute bagging, bound with iron bands, and shipped away to the warehouses to be sold.

Rice. — This is one of the most valuable food products of the world, being the main support of millions of people, as, for example, the Chinese. Although rice is not a staple food in the United States, the quantity raised is not enough for the use of the people. The plant is cultivated on the coastal plains from the Carolinas to Texas.

In the cultivation of rice, after preparing the ground as for other grains, and planting the seeds, it is usually necessary to flood the fields from ditches. As the plant grows it forms a slender stalk, upon the top of which appears a head of seed somewhat resembling a head of oats, the whole reaching a height of from three and a half to six feet. Just before the harvest season the water is drawn off, so that horses may enter the field, and the grain is then cut and the kernels threshed out, as in the case of wheat. After the hull is removed, the grains are polished at such cities as New Orleans, Savannah, and Charleston, and are then ready for market.

Sugar-cane and Sugar. — Sugar-cane is now not nearly so important in sugar manufacturing as formerly, being partly superseded in temperate climates by the sugar-beet, described in a previous section. But in the Southern states sugar-cane is still an important crop,

especially in the Mississippi delta, in the state of Louisiana. Here, a single sugar plantation may cover several thousand acres.

Either in the spring or fall the cane is planted in rows about six feet apart, and a crop is raised every twelve months, being cut in the fall, after the middle of October. The stalks grow to be two or more inches in diameter, and reach such a height that a man riding through them on horseback may easily be entirely hidden from view (Fig. 186). As soon as the stalks are cut they are drawn to the sugar-house in wagons, or, on the larger plantations, in railway cars. Then the cane is ground between rollers in order to squeeze out the juice, which is so acid that it must next be treated with lime. The waste cane after the juice is pressed out is used as a fuel to run the engines of the sugar-house, and the sap is placed in large vats and warmed to evaporate the water in it. As a result two products are formed, — a thick black molasses and brown sugar. This crude sugar is sent from the sugar-house to the refinery, where, by a complicated process, it is changed into white sugar.

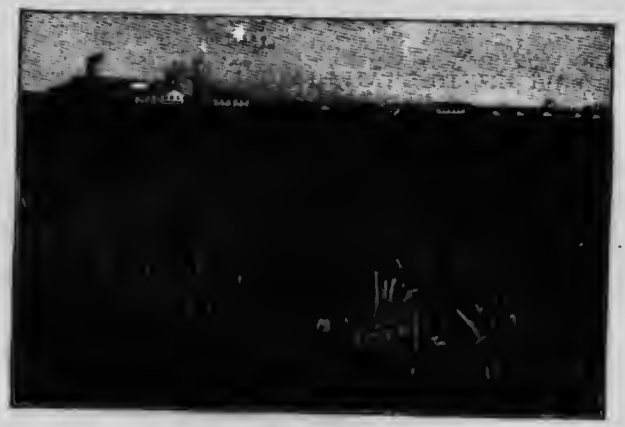


Fig. 186.

A sugar-cane field in Louisiana, with the sugar-houses in the background.

Fig. 187.

The pineapple growing in Florida.

Fruits. — Fruits, such as apples, peaches, pears, and grapes flourish in the warm climate of these states. Florida, however, is so far South that it has fruits of an entirely different kind. Here, orange and lemon groves are found in many parts; while at the extreme South grow the more tender tropical plants, such as the cocoanut and pineapple (Fig. 187). Florida and California supply most of the oranges and lemons used in Canada.

Grazing. — In western Texas, where the rainfall is insufficient for agriculture, but sufficient for grass, ranching is the chief industry.

Mining. — The Southern states are not so rich in mineral wealth as the Middle Atlantic states, but considerable mining is carried on.

Coal and Iron. — Coal and iron constitute the principal mineral wealth of the South. They are mined chiefly at CHATTANOOGA in Tennessee and around BIRMINGHAM in Alabama.

Petroleum. — Recent discoveries of vast quantities of oil in Texas have made the state one of the most noted oil-producing regions in the world.

Other Minerals. — *Marble* is quarried extensively at KNOXVILLE, Tennessee. *Gold* is mined in North Carolina, and mineral *phosphate*, a valuable fertilizer, is found in large quantities in Florida and Tennessee.

Manufactures. — BIRMINGHAM, the leading manufacturing centre of the South, is located on an old cotton plantation. It owes its importance to the fact that iron ore, coal, and limestone are all found near it; it manufactures iron and steel extensively. *Cotton cloth* and *cotton-seed oil* are manufactured now in many cities in the South, but the most noted are COLUMBIA in South Carolina and AUGUSTA in Georgia. The manufacture of sugar and of tobacco have already been referred to. KEY WEST, on a small coral key or island south of Florida, is noted for its tobacco factories, the leaf being obtained from Havana, Cuba.

Chief Cities. — NEW ORLEANS, situated at the gateway to the most productive valley in North America, is the greatest of all the Southern cities. It is very favorably located about one hundred miles from the mouth of the Mississippi, at a point to which ocean vessels can easily ascend. The river here makes a bend in the form of a half circle, which explains the reason for the name of "Crescent City," commonly applied to New Orleans.

FIG. 188.

A view in a cemetery in New Orleans, where the ground is so wet that the dead must be placed in stone tombs above ground.

Much of the land on which New Orleans rests is frequently below the level of the river (Fig. 188). To prevent the river from flooding the district, strong walls of earth called *levees* have been built along the banks. In the springtime these embankments sometimes give way; then the destruction to life and property is appalling. New Orleans is an important cotton market and a centre for sugar,

molasses, and rice, besides being a shipping point for products from farther up the Mississippi Valley.

MEMPHIS, in Tennessee, is one of the great cotton centres and lumber markets of the South. ATLANTA, the capital of Georgia, is an important railway centre, and is also noted for its manufactures. CHARLESTON and SAVANNAH are both important shipping ports for cotton and lumber. HOUSTON near the coast, is the largest city in Texas. GALVESTON, on the coast, exports large quantities of cotton and other products. DALLAS and FORT WORTH are important centres for cotton and cattle raising.

In June, 1906, the Indian and Oklahoma territories were joined as a single state called OKLAHOMA. The state is mainly a great plain, arid in the west, but fertile in the east. The principal products are corn in the north and cotton in the south. It was first opened to settlement in 1890. There are two flourishing cities, OKLAHOMA and GUTHRIE.

IV. THE CENTRAL STATES

(OHIO, KENTUCKY, INDIANA, MICHIGAN, ILLINOIS, WISCONSIN, MINNESOTA, IOWA, MISSOURI, KANSAS, NEBRASKA, SOUTH DAKOTA, NORTH DAKOTA)

Physiography and Climate. — A hundred years ago, when a considerable number of pioneers pushed across the Appalachian Mountains into Ohio and Kentucky, they were gladdened by the sight of immense tracts of level land. For hundreds of miles the plains slope gently toward the Mississippi; and then beyond that river they slowly rise again for hundreds of miles to the very base of the Rocky Mountains. In a few places, as in western South Dakota and southern Missouri, low mountains rise above the plains; but most of the country is a vast level tract, quite unlike the hilly and mountainous region farther east.

Not only did the newcomers find the land level, but most of it was free from forests and boulders, and for hundreds of thousands of square miles covered with grass, and awaiting only the plough of the settler.

While boulders are abundant in some places, the glacier has in most sections left a deep, rich soil free from stones. The reason for this is that here the glacier found softer rocks to grind up into soil than in New England, and was therefore more easily able to reduce them to small fragments. In many sections, as in part of Illinois, Indiana, and Ohio, the glacial drift is 100 or 200 feet deep. It is

the deposit of this drift which has caused the thousands of lakes in Minnesota and other states.

Caverns. — The abundance of limestone in Kentucky is the reason for the numerous caves that exist there. Limestone, although hard, is more easily dissolved by water than other rocks: and as the water seeps into the earth and enters the limestone joints, it slowly dissolves the rock away. In this manner many a long tunnel has been made, the largest that is known being the Mammoth Cave in Kentucky.

Not all parts of the Mammoth Cave are yet known, but it is said there are more than 150 miles of galleries. The entire cave is as dark as any mine, and the only sound to be heard is that of trickling water (Fig. 189).

FIG. 189.

A view in one of the Kentucky caverns, showing icicle-like stalactites, which are made of limy matter deposited by the water which slowly trickles from the cave roof.

The summers are too short for cotton, but they are long and hot enough for numerous other crops. The rainfall is also sufficient for crops, except in the extreme western part.

Agriculture. — All the way from eastern Ohio to central Nebraska agriculture is a very important industry. Grain raising is extensively carried on, the chief grains being *corn*, *wheat*, *oats*, and *barley*.

The United States produce three-quarters of the world's supply of corn. The great corn-growing states are: Nebraska, Iowa, Kansas, Missouri, Illinois, Indiana, and Ohio, which are known as the *corn belt* (Fig. 190). As corn is the best grain for fattening cattle and hogs, we can easily see why large stock yards and meat-packing establishments are found in such cities as CHICAGO, ST. LOUIS, and others in the corn belt. As corn is widely used in the manufacture of distilled liquors, there are many distilleries in ST. LOUIS, LOUISVILLE, PEORIA, and other cities in this belt.

Wheat is an especially important product in Kansas, Ohio, and Indiana, but the section which at present is most noted for its growth is that adjoining Manitoba and Saskatchewan, including western Minnesota and eastern Dakota. The great quantity of wheat produced in this region has helped the growth of the cities of MINNEAPOLIS, ST. PAUL, and DULUTH.

Besides corn and wheat, oats and barley are also raised in great quan-

tities in these states. As barley is largely used in the manufacture of beer, great *breweries* are to be seen in every large city. In CINCINNATI, ST. LOUIS, and MILWAUKEE beer making is one of the most important industries.

West of the one-hundredth meridian there is practically no farming without irrigation. This arid belt, extending westward to the Rocky Mountains, and from Canada to Texas, known as the *Great Plains*, is, therefore, devoted chiefly to *ranching*. The chief markets for the ranchmen's cattle are OMAHA, KANSAS CITY, ST. LOUIS, and CHICAGO. Millions of cattle are slaughtered every year in these cities.

FIG. 190.
A field in Kansas entirely given over to corn.

Lumbering. — This industry is carried on chiefly in Minnesota, Wisconsin, and Michigan, but is of less importance than formerly, as the forests are rapidly disappearing. In the three states mentioned, however, there are still large forests, containing hemlock, spruce, white pine, and cedar, and hardwoods such as oak, birch, and maple. All of this lumber is required for domestic use.

Owing to the excellent water-power on the Mississippi at MINNEAPOLIS, that city early became famous for lumber. There are also large mills farther down the river at WINONA, and at the head of Lake Superior at DULUTH and SUPERIOR; while CHICAGO is especially famous for its manufacture of furniture. Other centres of the lumber or the furniture business are LACROSSE and OSHKOSH in Wisconsin, and SAGINAW, BAY CITY, and GRAND RAPIDS in Michigan.

Mining. — Considerable mining is carried on in the Central states, although the states do not share at all equally in mineral deposits.

Petroleum and Natural Gas. — Great quantities of both these substances are obtained in Ohio, Indiana, and other states. In fact, these materials are so abundant in some places that where they are found towns have sprung up like mushrooms — as FINDLAY in western Ohio. The way in which gas and oil were formed has already been described.

Coal. — This mineral fuel is much more widespread in the Central states than oil and gas. In some places the beds lie near the surface, like

rock in quarries, and then coal mining is very simple; in others it is buried so deep that long shafts must be sunk to reach it. Being so valuable a fuel for houses and manufactories the coal is mined in many places. All the coal in this region is bituminous. Since bituminous coal is used in making coke, and because there is so much of this kind of coal, many of the cities of these states are engaged in iron manufacturing.

Iron. — In recent years inexhaustible beds of iron ore have been discovered northwest of Lake Michigan, and near the western end of Lake Superior (Fig. 191). The Lake Superior district is now the leading iron-producing centre in the United States. As there is no coal in that region, however, the ore is shipped in large quantities to the coal regions. Boats with cargoes of iron ore set out from the lake ports of DULUTH, SUPERIOR, ASHLAND, and MARQUETTE for manufacturing centres all along the lakes. As the ore must reach a point where coal is easily obtained, it is taken to CHICAGO, DETROIT, CLEVELAND, BUFFALO, etc.

FIG. 191.
An open iron mine in the Lake Superior district.

Copper. — Another very important metal found in the Central states is copper. This occurs in the pores of a lava rock and between the grains of a pebble beach, which, though now hardened into rock, was formed in the ancient sea. Indians and the early explorers found fragments of copper on the surface, and mines were later opened in the lava and beach rocks of the small peninsula jutting into Lake Superior on the south. Towns have grown up around the most important mines, the largest being CALUMET.

Lead and Zinc are mined in large quantities in Missouri in many places, especially at JOPLIN. **Salt** is obtained in Michigan and Kansas.

Building Stone. — Ohio and Indiana are especially noted for their limestone and sandstone, which are shipped in all directions for building purposes.

THE LAKE CITIES

It is evident that the raw products of the farms, ranches, forests, and mines in the Central states must lead to much commerce: and that, since coal is included among the raw products, manufacturing must also be developed. This means, of course, that there must be many large cities; and since the Central states have no ocean coast, we naturally find the cities along the Great Lakes and the three great rivers — the Mississippi, Ohio, and Missouri — where it is possible to ship goods by water. The Lake cities come first.

DULUTH AND SUPERIOR. — At the western end of Lake Superior there is a fine, large harbor, one side being in Minnesota, the other in Wisconsin. Upon this harbor are two cities, DULUTH and SUPERIOR, which together have a population of about 100,000. The chief products of this vicinity are iron, lumber, and wheat, which are shipped eastward in immense quantities from these two ports. At Duluth are enormous elevators for storing grain, and flour mills for grinding it up.

CHICAGO. — Near the southern extremity of Lake Michigan in Illinois is situated the great city of CHICAGO. It is the nearest lake port to one of the most productive grain regions in the world, and it is, therefore, an important shipping point for grain. It is also within easy reach of the coal-fields, while lumber and iron ore are readily brought to it by boat. These advantages have caused Chicago to grow with wonderful rapidity. In the year 1840 there were but 4470 inhabitants and now nearly 2,500,000. To-day Chicago is the second city in size in the New World.

Chicago is not only a great grain market, but also a most important meat market. All the grazing states of the West ship stock to this point, and in the city itself nearly a square mile is taken up by the famous Union Stock Yards, consisting of large sheds, pens with high fences, and troughs for food and water (Fig. 192).

FIG. 192.
The Chicago stock yards.

The meat that is not sold fresh is canned. The fat of the hog is made into lard, and not a little beef fat is converted into imitation butter, such as oleomargarine. The bones are burned and used in the manufacture of sugar; and the horns and hoofs are used in making gelatine and glue. The hides are made into shoes, gloves, harnesses, and other goods. Even the bristles of the hog are saved to make brushes; and the hair removed from the hides of cattle is valuable in making plaster. In the packing business nothing is wasted.

Being near the forest regions, Chicago has become a lumber market, and iron ore is easily brought by boat. Therefore the opportunities for manufacturing are excellent; for, although there is no natural water-power in that vicinity, vast coal fields are not far away. Some of the more

important manufactures are: iron and steel goods, furniture, farming implements, freight and Pullman cars, and clothing.

To prevent the contamination of the waters of Lake Michigan, from which the city obtains its supply of drinking water, by the sewage from the city, an immense drainage canal has been recently completed connecting the lake with the Illinois, a tributary of the Mississippi. As this canal is wide and deep enough for boats, it will undoubtedly develop into a ship canal. In that case large boats may reach Chicago from the Gulf of Mexico, as they do now from the St. Lawrence.

One of the most noted institutions in the city is the University of Chicago, established in 1890. Chicago is also famous for its beautiful park system.

MILWAUKEE, the largest city in Wisconsin, deals extensively in grain, lumber, and leather, and has large flour mills. Its immense breweries have already been mentioned. DETROIT, the largest city in Michigan, is an important shipping and manufacturing centre. Not far away, at ANN ARBOR, is the University of Michigan. CLEVELAND, in Ohio on Lake Erie, has large manufactures and an important trade in grain, lumber, and ore. It is one of the busiest and most rapidly growing of the lake cities.

THE RIVER CITIES

ST. LOUIS has a favorable position in the centre of the productive Mississippi Valley. Owing to its position on the Mississippi near the mouth of its two largest tributaries, it has a large amount of trade both by water and by rail. It is an important market for grain, live stock, cotton, and tobacco. Its manufacturing industries are also very important.

FIG. 193.
The Pillsbury-Washburn flour mills at Minneapolis.

MINNEAPOLIS and ST. PAUL, the twin cities, with a combined population of over 400,000, are important markets for grain and live stock. At Minneapolis the Falls of St. Anthony furnish splendid water-power. The city is also in the midst of the wheat-region; and this, with its water-power, has caused Minne-

apolis to become the leading flour-producing centre in America (Fig. 193). St. Paul, only ten miles distant, is the capital of Minnesota, and an important trade centre.

The leading cities along the Missouri are OMAHA in Nebraska, and KANSAS CITY in Missouri. Each is surrounded by a fertile farming country, and each is also an important market for live stock, and in each the meat-packing industry is gaining rapidly.

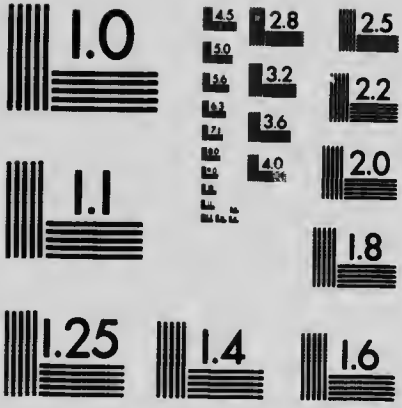
CINCINNATI, the largest city in the Ohio Valley, is a great manufacturing centre (Fig. 194). The chief manufactures are pottery, iron, machinery, and clothing. Across the river in Kentucky are COVINGTON and NEWPORT, both almost a part of Cincinnati. Farther north and east, in Ohio, are DAYTON and SPRINGFIELD, both noted for the manufacture of farm machinery. COLUMBUS is an important trade centre. LOUISVILLE is the largest city in Kentucky. There are rapids in the Ohio at this point, and a canal leads around them. The city is an important railway centre, as well as a centre for tobacco. INDIANAPOLIS is in the centre of a splendid farming district.

FIG. 194.
River boats on the Ohio at Cincinnati.

V. THE WESTERN STATES

(WASHINGTON, MONTANA, OREGON, IDAHO, WYOMING, CALIFORNIA, NEVADA, UTAH, COLORADO, AND ARIZONA AND NEW MEXICO TERRITORIES)

Physiography. — The Western states are made up almost entirely of plateaus and mountains. Most of the surface is more than a mile above sea-level, while some mountain peaks are two and three miles in height. The extreme eastern portion is a continuation of the Great Plains, which reach to the very base of the Rocky Mountains. These mountains extend entirely across the country into Mexico on the south and Canada on the north. They are made up of a large number of ranges and ridges, which attain their greatest height in



Colorado. A long distance farther west, and almost parallel with the Rockies, is another system of mountains, called the Sierra Nevada in California and the Cascade Ranges in Oregon and Washington. Still farther west and close to the coast is a third series, known as the Coast Ranges, which in places rise directly out of the ocean.

Just west of the Rocky Mountains is a plateau, dotted with numerous mountain peaks and small ridges. It is higher at the two ends than in the middle, and may be divided into three parts: (1) the great Columbia plateau of Idaho, Oregon, and Washington on the north; (2) the Colorado plateau of Arizona and Utah on the south; and (3) the Great Basin of Utah and Nevada between the two. The numerous short north and south mountain ranges in the Great Basin are called the Basin Ranges

FIG. 195.
Mt. Hood, Oregon.

Climate. — Unlike the East, where the climate is very uniform over large sections, the West is a region of contrasts, with a great variety of climate from place to place. The most general fact about the climate of this vast region is its aridity. Nearly everywhere it is so dry that no agriculture is possible without irrigation. Only among the high plateaus and mountains, and in Washington, western Oregon, and northern California, is there rainfall enough for forests or for farming. Thus, almost one-fifth of the entire surface is a partial or complete desert.

Along the northwestern coast the damp west winds bring so much vapor that the rainfall is heavy. Indeed, near the coast of Washington, there is a rainfall greater than in any other part of the United States, the heaviest rain coming in winter. But being robbed of its vapor in crossing the mountains, the air descends on the eastern side so dry that agriculture is possible only in a few sections, as in the high mountain valleys and in the wheat district of central and eastern Washington.

Mining. — Every one of the Western states contains mineral deposits of some kind, as gold, silver, copper, lead, mercury, and coal. This section is now a most important mining district, and a vast amount of capital is invested in the industry.

At the present time Colorado produces more gold and silver than any other state, and much copper, lead, iron, and coal besides. Among the mountains in this state one sees mines almost everywhere; but one of the most noted mining districts is near LEADVILLE, a city at an elevation of over ten thousand feet above sea-level. Another well-known mining town is CRIPPLE CREEK. With the discovery of gold, thousands of people rushed in from all directions, and the city sprang up almost in a day.

The western half of Montana is another great mining section. BUTTE is the most important mining centre. Here the principal metal is copper, although some gold and silver are mixed with the ore. HELENA, the capital of Montana, is the centre of an important gold-mining district. Even the gravel out of which many of its streets are built has been washed for gold.

In Arizona, too, mining is the principal industry, much copper, silver, lead, and gold being produced. TUCSON, the largest city, is the most important centre of the mining business. VIRGINIA CITY in Nevada was at one time famous for the amount of gold and silver taken from its mines, but many of these have become exhausted, and the city has now dwindled to a town of 2000 inhabitants. Coal is mined in Colorado and Washington, and iron near PUEBLO in Colorado.

Lumbering. — In the damp, equable climate near the northwestern coast are forests of giant redwood, fir, cedar, and spruce trees, many of the trees being from six to ten feet in diameter, and some in California very much larger. TACOMA and SEATTLE are important lumber centres, and have enormous saw-mills.

Agriculture. — Farming is carried on extensively in the well-watered section of the Northwest. This is a great wheat-producing region, while barley and hay are important crops. Great quantities of fruit are also raised in this region, apples, pears, and grapes being produced. Farther south, near STOCKTON and SACRAMENTO for instance, are groves of oranges, lemons, olives, and figs.

But the only way in which farming is possible in most other parts of the West is by means of irrigation (Fig. 196), which, in Colorado, Utah, and southern California, has converted many barren regions into fertile farming lands. In Colorado, DENVER and PUEBLO are important centres of irrigation farming, which has contributed not a little to the growth of those cities.

Most of the state of Utah was originally almost a desert, but large areas have been entirely changed by the Mormons, a religious sect organized by Joseph Smith in New York in 1830. Under the leadership of

Brigham Young, these people migrated into the then unknown West, and settled a few miles from Great Salt Lake. There they commenced to build Salt Lake City, which is now one of the most beautiful cities in the country. They also began to raise crops by irrigation, to plant fruit trees, and to convert portions of the desert waste into beautiful gardens.

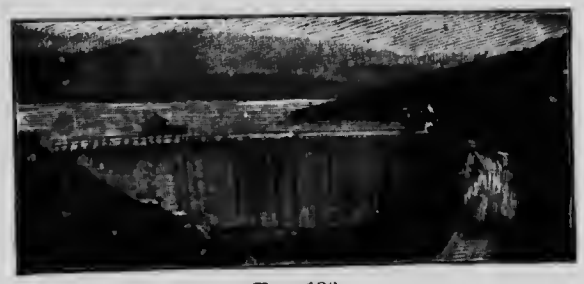


Fig. 196.

A reservoir for irrigation near San Diego, California.

Southern California is also noted for its extensive irrigation, the water being supplied from the neighboring mountains. The region is far south, and its shores are bathed by warm ocean waters, so that the climate is warm and delightful. Although the land is by nature almost a desert, the addition of water to the fertile soil has changed the country about Los Angeles almost to a garden.

This region is famous for its orange groves (Fig. 197). The winter season is the harvest time for oranges, which begin to be picked from the trees about the middle of November, and continue to be gathered until February or later. They are cut from the trees, assorted according to size, then packed in boxes and shipped away. Lemons, peaches, grapes, figs, olives, walnuts, and almonds are also raised.

Fig. 197.

An orange grove near Los Angeles. Notice the snow-capped mountains in the background from which water for irrigation is obtained.

Ranching. — There is so little rainfall in the arid West that only a part of the land can be irrigated. This leaves most of the country suited only to grazing; and wherever there is water enough for the animals to drink, cattle, horse, and sheep ranches are found. In some parts herds of goats are raised.

Billings in Montana is in the centre of an important sheep-ranching district, and is consequently a great wool market. A good-sized sheep ranch has from twenty-five thousand to forty thousand head of sheep, which may be fed partly on the government land, or the "range," and partly on land fenced in and owned by the ranchman. During

the coldest weather the sheep are, in many cases, driven into protected *corrals* and fed on *alfalfa*, a plant resembling clover. To save the expense of drawing the wool long distances to market, in June the sheep are usually driven near to some wool market and sheared there. In this way, too, the sheep secure food while on the journey to and from the market.

Scenery

The Yellowstone Park. — This region, in the northwest corner of Wyoming, is a tract of land which the government of the United States has set aside as a national park. Among the many objects of interest are boiling springs, boiling mud springs of different colors, deep canyons, and waterfalls. This region is famous for its geysers — boiling springs, from which hot water and steam occasionally burst forth with great violence, sometimes to the height of 100 or 200 feet. "Old Faithful," one of the most regular of these, plays at intervals of about 65 minutes to a height of 130 feet. The outbursts are really explosions of steam, the heat being supplied from deep in the earth (Fig. 198).

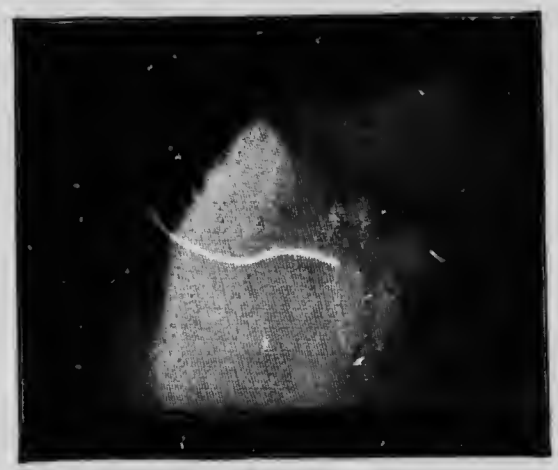


Fig. 198.
An eruption of one of the geysers of the Yellowstone Park.

Colorado Canyon. — For 300 miles the Colorado flows at the bottom of this deeply cut canyon 6000 feet below the level of the plateau. As a person first looks out over the canyon he sees nothing but towers, pinnacles, many-colored layers of rock, and apparently boundless depths. When he finally takes a position from which the thread-like stream below may be spied in the abyss it seems almost impossible that so little water could have wrought such mighty havoc. The difficult path which leads to the bottom is seven miles long, and the trip down and back is a full day's journey. At the bottom the scene is entirely changed; and, as one looks upward to see himself shut in by walls which seem to extend to the very heavens, his own littleness and the immensity of the work of nature are wonderfully impressed upon him.

The Yosemite Valley. — This wonderful valley is on the western slope of the Sierra Nevada Mountains in California. Into it, with one mighty leap over a precipice 1500 feet high, rushes the Yosemite River, forming the world-famed Yosemite Falls. Below this are some cascades, then another fall of 400 feet. Near the fall are seen the giant trees of the world, the largest of which is 31 feet in diameter.

Cities

Cities in the Interior. — These are few in number, and most of them have already been mentioned. Whatever importance they have is due chiefly to mining, farming by irrigation, and grazing.

Denver, Colorado, is the largest city of the interior. Originally a small mining camp, its growth has been due chiefly to two facts: (1) the numerous mining towns among the mountains, which look to it for supplies; and (2) the near presence of water, which has made irrigation on a large scale possible. The city is now a railway and manufacturing centre. It is also important as a health resort; its altitude of over 5000 feet and its dry climate render it especially adapted to persons suffering from lung trouble. Colorado Springs, south of Denver, is one of the leading health resorts in the country.

Fig. 199.

The capitol building at Sacramento, one of the most beautiful state capitols in the United States.

Cities on the Pacific Slope. — The largest city in all these states is San Francisco, located on a remarkably fine harbor formed by the sinking of the coast. Other important cities are near it, the largest being Oakland on the opposite side of the harbor. To the northeast is Sacramento, the capital of California (Fig. 199).

Owing to an insufficient supply of coal, the manufactures of San Francisco, though important, are not so extensively developed as might be expected. One sees the effect of this lack of coal on the railways, for wood is a common fuel on the engines of northern California. The city is the

greatest shipping point on the Pacific coast, and formerly monopolized the trade with the Orient. In 1906, as the result of a disastrous earthquake in which many lives were lost, a fire broke out which destroyed seven square miles of the city, with a loss of over $300,000,000. It is, however, being rapidly rebuilt.

PORTLAND, on the Columbia River 100 miles from its mouth, at the head of deep-water navigation, has an excellent harbor. From it are shipped the leading products of Oregon. It also has extensive manufactories of woollen goods, flour, and furniture. It is the centre of the salmon canning industry for Oregon (page 156). To th south is SALEM, the capital. In Washington, on Puget Sound are situated SEATTLE and TACOMA. Coal, lumber, grain, and hops are the principal exports.

Territories. — Arizona and New Mexico are still territories, although Arizona has twice as many inhabitants as the state of Nevada, and New Mexico nearly four times as many. ALBUQUERQUE is the largest city in New Mexico.

FIG. 200.

Mt. St. Elias, Alaska, 18,100 feet high, and for a long time supposed to be the highest peak on the continent.

VI. ALASKA

Climate and Physiography. — Since the Arctic Circle extends across the northern part of Alaska, it will be seen that the climate must be very uninviting. The winters are long and cold, and the summers short and cool. A strip of coast land extends southward from the main peninsula of Alaska, and to this the prevailing westerly winds bring an abundance of rain and snow. Since these winds come from the ocean, they also render the summer climate

much less cool than in the northern part of the territory. In this portion is situated SITKA, the capital, where the governor of the territory lives.

A large part of Alaska is mountainous. Among these mountains are the loftiest peaks of the continent, the highest yet discovered being Mt. McKinley, which is 20,464 feet high. Owing to the latitude, most of the mountains are snow-covered throughout the year, and among them are innumerable glaciers, many of which reach down to the sea.

One of the largest glaciers now on the continent, known as the *Muir Glacier*, is located in Alaska not far north of Sitka. It is so wonderful and beautiful that many tourists visit it every year. The long peninsula and the chain of Aleutian Islands which form the southern boundary of Bering Sea are really a growing mountain chain sixteen hundred miles in length. All together there are fifty-seven volcanoes in this chain, and it was here, in 1795, that a new volcano suddenly broke forth, building a lofty cone where previously ships were able to sail.

Fishing. — Among the resources of Alaska, as in the case of other far northern lands, those of the sea are especially important. In the shallow waters near the coast both cod and halibut abound, while immense numbers of salmon run up the rivers every summer. The fishing industry is only partly developed, chiefly because of the great distance from a profitable market.

Whaling. — Every year steamers, specially built for the purpose, venture through Bering Strait into the Arctic Ocean in search of the whale. It is a hazardous occupation, and but few ships are now engaged in it. They are obliged to push their way into the *floe* ice, in which they are in danger of being imprisoned and held firmly through the winter.

FIG. 201.

Fur seals among the rocks near the coast of one of the Pribilof Islands.

Sealing. — In the Arctic are found many different kinds of seal. One of these, the *fur seal*, which lives in Bering Sea, is of great value because of its soft fur, which is much used for winter cloaks.

During the greater part of the year the fur seals swim in the sea in search of food; but in the spring, during the breeding season, they resort to the Pribilof Islands (Fig. 201). At the proper season the sealers select a number of males, — for a law forbids the taking of the females, — and drive them off for slaughter, much as sheep would be driven.

Mining. — While there is some opportunity for farming in southern Alaska, and the great tracts of forest land may be the seat of an important lumbering industry in the future, at present the most noted industry of Alaska is gold mining. There are extensive deposits of gold, copper, coal, and other minerals; but they are so difficult to reach that there has been little development of any of these except the first. A short distance north of Sitka, at JUNEAU, there are very profitable gold mines; and elsewhere in the territory gold mining is also carried on. CIRCLE CITY and NOME CITY are important mining centres.

VII. THE HAWAIIAN ISLANDS

Far out in the mid-Pacific, west of the United States coast, is a mountain chain fifteen hundred miles long, most of which lies beneath the ocean. From this long submarine ridge there rise several volcanic peaks, forming a chain of islands known as the Hawaiian Islands. The largest is Hawaii. Each of the islands is composed chiefly of lava which has been erupted from within the earth. Two of the large Hawaiian volcanoes are still active, the largest, Mauna Loa, extending nearly fourteen thousand feet above the sea. From the coast the sea-bottom descends so rapidly that, within a few miles of the shore, a depth of eighteen thousand feet is found. Therefore, if the water should be removed, a mountain peak would be revealed rising nearly thirty-two thousand feet above its base — a loftier mountain than any known on the land.

FIG. 202.
Building a grass hut in the Hawaiian Islands.

As the islands are in the midst of the broad Pacific and therefore

surrounded by warm ocean water, the climate near sea-level is warm and wonderfully equable. The northeast winds blow steadily and bring an abundance of rain to the windward northeastern slopes. The opposite or *leeward* slopes are very much drier, and in places even arid.

Fig. 203.
Planting Rice.

The Hawaiian Islanders are an intelligent race, resembling the natives of other Pacific islands. Since white men brought in new methods of agriculture the larger islands have become fairly productive, the principal crop being sugar. Coffee, tropical fruits, and rice (Fig. 203) are other products, the last being cultivated by the Chinese, who make up a large part of the foreign population. There are also many Japanese, Portuguese, and Americans.

While some of the inhabitants are engaged in agriculture, large numbers are gathered in small villages along the sea-coast. There are only two cities, Honolulu on the island of Oahu, and Hilo on Hawaii.

Questions and Suggestions

The United States. — (1) Give a brief sketch of the history of the United States. (2) Show how its territory has gradually increased. (3) Describe the government of the United States, and compare it with that of Canada. (4) Trace on the map the principal transcontinental lines in the United States.

The New England States. — (1) Describe the surface of the country and name the principal mountain ranges. (2) How do the ocean currents influence its climate? (3) Describe lumbering and fishing. (4) What led to the development of manufacturing in New England? (5) Name the principal manufactures and the chief cities engaged in each. (6) What can you say about the manufactures of metals? (7) Give several facts about Boston. (8) What large cities are near it? (9) Locate on the map the principal cities. (10) What are the most important summer resorts?

Middle Atlantic States. — (1) Describe the physiography of these states: the Appalachian Mountains, the Piedmont Plateau, the coastal plains, the fall line and its importance; the coast-line. (2) Tell about the climate, its variations, and their effects on crops. (3) Tell about the forests. (4) What cities are noted for the oyster industry? (5) Describe the tobacco industry. (6) Name the chief cities engaged in its manufacture. (7) Tell what you can about coal, petroleum, and natural gas. (8) Name the principal cities engaged in the manufacture of iron. (9) What other manufactures are there in the Middle Atlantic

states? (10) Tell all you can about New York. (11) Describe the Erie Canal. (12) Mention two other large cities, and tell some important facts about each. (13) Locate the principal cities, and mention some notable fact about each. (14) Compare the Middle Atlantic with the New England states.

THE SOUTHERN STATES. — (1) Describe the surface of the Southern states. (2) Compare the climate with that of New England. (3) What cities have important lumber industries? (4) What about tobacco raising in the South? (5) Tell all you can about cotton. (6) Tell about sugar. (7) Tell about rice. (8) What fruits are raised in the South? (9) What other crops are important? (10) Where are coal and iron found? (11) Where is iron manufacturing carried on? (12) Name the other manufactures. (13) Why are there not so many large cities in the South as in the North? (14) Tell about New Orleans. (15) Locate the other large cities, and mention some fact of importance about each.

THE CENTRAL STATES. — (1) Describe the surface of the Central states. (2) What about the climate of this section? (3) Tell about the Mississippi Valley. (4) Where is tobacco raised? (5) What kind of stock is raised in Kentucky? (6) Tell about corn. (7) Tell about wheat. (8) Describe cattle ranching. (9) Where are the forests? (10) What cities are engaged in lumbering? (11) Where are oil and gas obtained? (12) Tell about iron mining. (13) Tell about copper mining. (14) Where are the principal cities located? (15) What cities are on Lake Superior? (16) Tell all you can about Chicago. (17) Name and locate the Great Lake cities, and mention some important facts about each. (18) Describe the river cities. (19) Tell about flour milling.

THE WESTERN STATES. — (1) Describe the surface of the Western states. (2) Tell about California. (3) Tell all you can about the climate of this section. (4) What minerals are found in the West? (5) Name the principal mining towns. (6) Tell about gold, silver, copper, and coal mining. (7) Tell about irrigation. (8) Tell about cattle ranching in the West. (9) Describe the Yellowstone Park. (10) Tell about the Colorado Cañon. (11) Describe the Yosemite Valley and the Big Trees. (12) Tell all you can about San Francisco. (13) Mention the other large cities and locate each. (14) Describe salmon fishing and lumbering in Oregon and Washington.

ALASKA. — (1) Describe the surface of Alaska. (2) Tell about the climate. (3) Tell about fishing. (4) Describe sealing. (5) Tell about gold mining. (6) Name the principal places.

HAWAIIAN ISLANDS. — (1) Describe these islands. (2) What about the people? (3) What are the principal industries? (4) Name the two cities.

SUGGESTIONS. — (1) Find out all you can about the leading manufactures of New England, and make a collection as complete as possible of the manufactured articles. (2) Compare the fishing along the New England coast with that along the coasts of Nova Scotia and Quebec. (3) Obtain a guide-book to Boston, and note the various points of interest. (4) Compare in population the large cities of New York State with those in Ontario. (5) Compare the Erie Canal with the Welland Canal. (6) Collect samples of rice, cotton, and sugar, both in the finished article and the raw material. (7) What effect will the establishment of cotton mills in the Southern states have on the cotton mills in Canada? (8) In what way are the Southern states dependent on the Northern states? (9) Write a description of the prairies. (10) How do you account for the extraordinary growth of Chicago? (11) Find out all you can about the methods of irrigation used in the Western states. (12) Write an essay describing the natural wonders of the Western states. (13) Find out all you can about the California earthquake of 1906 and the San Francisco fire.

VI. MEXICO, CENTRAL AMERICA, AND THE WEST INDIES

Mexico

History. — After Columbus discovered the West Indies, the neighboring coast was visited and settled, and thus the Spaniards naturally came into possession of Mexico. One of the boldest of the Spanish invaders was Cortez, who conquered the Aztec and Pueblo Indians as far north as northern New Mexico. So much gold and silver was found in Mexico that many Spaniards settled there and began to develop the country. But Spain governed Mexico so badly that the people rebelled, and in 1821 won their independence, establishing a republic with a government modelled after that of the United States. There are a number of states, each with a government and capital, and a central government with the capital at Mexico City, where the President lives.

Physiography and Climate. — Mexico consists of four areas of different altitudes. Near the sea are coastal plains and other low-

Fig. 204.

A scene on the arid plateau of Mexico. A road bordered by cactus.

lands. The interior, occupying a large part of the country, is an arid plateau (Fig. 204). The third area includes the slopes between these two, and the fourth consists of peaks and mountain ranges which are a continuation of those in southern United States. Among

Fig. 205.

Map Questions.—(1) Trace the boundaries of Mexico, and of each of the States of Central America. Name the capital of each State. (2) Point out the island groups that make up the West India Islands. Locate the more important islands. (3) Estimate from the map the area of Mexico. (4) Point out the most important physical features of each of the countries, and compare those of Mexico and Central America. (5) Compare the eastern with the western coast of these countries. Locate the principal bays and capes. (6) Trace the railways in these countries and in Cuba. (7) How are the West Indies connected with Canada, and with the United States? (8) Locate the principal cities and towns. (9) At what points would it be possible to construct the canal across Central America? (10) Estimate the distance from Montreal to Vancouver by way of such a canal.

the mountains there are a number of volcanic cones, two of them, *Orizaba* and *Popocatepetl*, being among the highest peaks on the continent.

This part of North America is narrow, and since the north and south divide causes some of the streams to flow eastward and the others westward, there can be no long rivers in Mexico. The steep slope from the plateau to the lowland gives the streams a rapid fall, so that they have cut deep canyons in the edge of the plateau. Moreover, the arid climate of the interior allows them little water. This lack of large navigable rivers has interfered very much with the development of Mexico.

The coast of Mexico is regular and there are few good harbors. Two projections form the peninsulas of *Yucatan* and *Lower California*, the former being a continuation of the mountain chain which made Cuba, Haiti, and Porto Rico. Lower California is a southern extension of the Coast Ranges of the United States.

If the surface of Mexico were near the sea-level, the climate of the greater portion would be tropical; but owing to the differences in altitude, there are several different climates. The low coastal plains, near Vera Cruz and in Yucatan, are hot and damp, being reached by the winds which blow across the Gulf of Mexico and Caribbean Sea. There is also much rain upon the cooler plateau slopes of eastern Mexico; but with the exception of these regions, the greater part of Mexico has too little rainfall for agriculture without irrigation.

Agriculture and Ranching. — Although the climate of a large part of Mexico is arid, much agriculture is carried on by the aid of irrigation, which is made possible by reason of the snow and rain among the mountains. On the irrigated farms the products of the temperate zone are raised, such as wheat, corn, and beans, — the latter being one of the staple elements of the Mexican diet. Much fruit is also produced, especially apples, pears, peaches, and grapes.

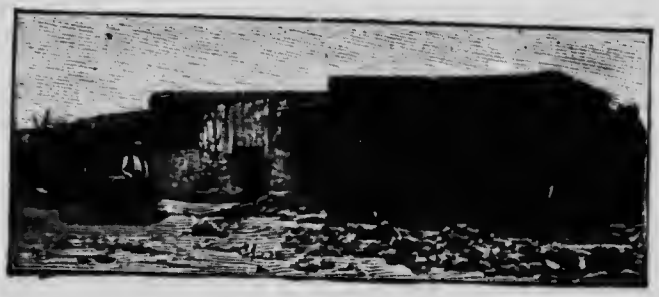


FIG. 206.

An adobe house in Mexico.

The Mexican farming methods, which are very crude, are a mixture of ancient Aztec customs and those introduced from Spain. In Mexico one may still see the wooden plough, which barely scrapes the ground, and also the wooden-wheeled cart, drawn by oxen.

The home life of the people of the poorer class is interesting. Their houses have but one story and are commonly built of a brick made of clay mixed with straw, and then dried in the sun (Fig. 206). These sun-dried bricks, or *adobes*, are larger than the bricks that we use, and are piled tier upon tier, being joined by layers of mud. Often there is but one room, the ceiling being made of brush, and the floor of nothing but the earth or stones. In this one room the whole family cooks, eats, and sleeps. Their food usually consists of very simple materials, such as unraised bread, baked in the fireplace, beans, and occasionally meat, commonly cooked with red pepper. Men, women, and children use tobacco.

Upon the arid plateaus are found the sage bush, the mesquite, and the cactus. One among them, known as the *maguey*, or *agave* (Fig. 207), is very widely used in Mexico. Its stout, sharp-pointed leaves rise from near the ground in a tuft. In the centre of this rests the flower stalk, which sometimes reaches a height of forty feet, and bears a cluster of white flowers on the top. It is also called the *century plant*, because it requires so long (from ten to seventy years) to reach maturity and produce this flower stalk. From the fermented juice of this plant the Mexicans obtain an alcoholic drink known as *pulque*, and by distilling it, a drink known as *mescal*. The tough leaves contain a fibre which is made into paper and strong thread. So valuable is the maguey that it is carefully cultivated upon plantations.

FIG. 207.
A field of maguey plants (century plants).

On the damp lowlands, rice, sugar-cane, and cotton are produced; also tropical fruits, such as oranges, bananas, and pineapples, quantities of which are exported from southeastern Mexico. Upon the slopes between the tropical lowlands and the temperate plateau much tobacco and coffee are raised.

The latter requires a rich soil, abundant moisture, a warm climate, and plenty of shade. In order to secure shade, the coffee bush, which reaches a height of from ten to fifteen feet, is planted in the shades of higher trees. A white blossom appears as early as March, and after the

flower falls off the coffee berry begins to grow. It resembles a dark red cranberry. On the outside is a husk enclosing two kernels that fit with the flat sides together; and in order to prepare the coffee for the market the outside husk must first be removed. On the larger plantations, machinery for this purpose is employed.

Southern Mexico. — In southern Mexico, near Central America, there are dense tropical forests from which are obtained many valuable woods, such as mahogany, rosewood, and logwood. Elsewhere in that country forests are rare, except upon the higher mountains. In fact, there is so little forest land that the Mexicans living on the arid plateau find difficulty in obtaining wood for fuel. Much of this is dug from the ground; for some of the arid-land bushes, notably the mesquite, have long, thick roots which make excellent firewood.

Besides the valuable woods of the tropical forests, southern Mexico produces the vanilla bean, which grows upon a climbing plant. In the seed-pod are nestled the very fragrant beans which are used for flavoring extracts, for perfumeries, and for medicine. Pepper, made from the dried berry of a tropical plant, is also obtained in Mexico. Indigo, useful as a dye, is likewise obtained from a berry in this region, and sarsaparilla roots from the roots of a tropical plant.

The Mines. — One of the prineipal objects that the Spaniards had in exploring the New World was to obtain the preeious metals, gold and silver; and both in Mexico and South America they were rewarded in their seareh by the discovery of very rich mines, some of which had previously been worked by the Indians. Mexico is still a great mining eountry, being the seeond silver-produeing nation in the world. There are also some mines of copper and lead.

Many of the mines are now operated by Europeans, Americans, and Canadians, so that modern methods have been introduced; but in some of those managed by Mexicans, primitive methods, similar to those used by the Indians, are still employed. Large areas have never been carefully examined for ore. In fact, some parts of the country are still occupied by Indian tribes, who not only prevent miners from coming in, but even defy the government.

The Cities. — While great numbers of Mexicans are engaged in farming and ranehing, and are therefore seattered over the country, they have, wherever possible, gathered together in villages and small towns. These communities are often neeessary in order to obtain the water supply needed for irrigation. It is usually too great a task for a single farmer to build a ditch; and therefore a number combine and thus live elose together.

In a few places, too, there are large cities, the greatest being

Mexico City, with a population of about 350,000. In this city, as in numerous other places in Mexico, there are many fine buildings, especially cathedrals. Another city in the interior is Puebla, founded in 1531. It is situated near one of the ancient cities, or pueblos, of the Aztecs. San Luis Potosi is quite a large city, and there are a number of other cities with a population of 50,000 and over. Since the eastern coast is low and sandy, it has no good harbors, the two largest cities on the sea-coast being Tampico and Vera Cruz, whose harbors are protected by breakwaters. There are good harbors on the western coast, as that at Acapulco; but since it is backed by high mountains and a worthless country, that port has never become important.

Because of the ignorance of the working class, and the absence of water-power and coal, there is very little manufacturing in Mexico; and that which is done is largely carried on by hand. However, even the uneducated Mexicans are artistic and do some beautiful kinds of hand-work. There are large tobacco factories in the tobacco district. Some earthenware is also manufactured, and some cotton cloth. But Mexico is now making rapid progress.

Central America

The Republics. — South of Mexico are six small nations, known as the Republics of Central America. These six countries are in a perpetual state of unrest. An ambitious general, obtaining a few followers, is likely at any time to start a revolution and overturn the existing government. There is an almost constant state of turmoil in these nations; war after war has occurred; presidents have been deposed or murdered; and such a state of unrest has existed that there has been little chance for development. Their political condition resembles that of the country in which they live, which is subject to disastrous eruptions of volcanoes, and to earthquakes of great destructiveness.

The earthquake shocks have levelled towns and killed thousands of people. For instance, San Salvador, the capital of the country by that name, was so frequently destroyed by earthquakes that the inhabitants decided to choose a new location for their city; but the one they selected is hardly better than the one they abandoned.

Most of Central America is mountainous; and, being in the tropical zone, the climate is hot. The rainfall is heavy, especially

on the eastern coast, where it is so rainy that there are dense jungles along the shores of the Caribbean Sea.

Of the six countries forming the Central American group, Nicaragua, Honduras, and Guatemala are about equal in size, while San Salvador, Costa Rica, and Panama are smaller. In addition to these, just south of Yucatan, is British Honduras (Belize), a crown colony of Great Britain. The largest city in the group is NEW GUATEMALA, the capital of Guatemala, which has a population of over 70,000. Like San Salvador, the inhabitants have been forced to change its location, which was formerly at the base of two very active volcanoes; hence the name *New* Guatemala.

FIG. 208.
Loading a train with bananas in Costa Rica.

A large portion of these countries is occupied by dense tropical forests, from which are obtained mahogany, rosewood, logwood, fustic, and other valuable cabinet and dye woods. The rubber tree also grows there, and the production of rubber is one of the industries of the region.

FIG. 209.
Natives sorting coffee in Costa Rica.

As in Mexico, coffee is raised on the hill slopes in the shade of the forest trees. One of the most important districts for this industry is Costa Rica. Bananas (Fig. 208), sugar, tobacco, indigo, and cocoa are other products of Central America.

Some gold and silver are obtained, the former near BLUEFIELDS, the latter in Honduras.

The inhabitants are mainly Indians, Spaniards, or half-breeds; and owing to the uneducated condition of the great majority, and

even the uncivilized condition of many, there is practically no manufacturing carried on in these countries.

The United States has recently determined to build a canal across the Isthmus of Panama, and has acquired the land necessary for that purpose from the newly formed republic of Panama. The work is being proceeded with as rapidly as conditions will allow. What effect will the opening of this canal have on the seaports of the Atlantic coast? What distance will be saved between Montreal and Vancouver? New York and San Francisco? London and Yokohama?

The West Indies

From the Yucatan and Florida peninsulas a chain of islands reaches to the mouth of the Orinoco on the South American coast. These islands enclose the Caribbean Sea; and, with the aid of the peninsulas of Florida and Yucatan, the Gulf of Mexico also. With the exception of the northern portion of the Bahamas, the entire archipelago lies within the tropics, and therefore has a warm climate; and all have a damp climate. There are many scores of islands in the group, only a few of which are large.

Cuba and Porto Rico. — Cuba is the largest of the West Indies, while Porto Rico ranges fourth in size, being exceeded by Haiti and Jamaica. Cuba, Haiti, and Porto Rico form a portion of a single mountain chain, highest in Haiti, though reaching an elevation of 8600 feet in Cuba.

While there are tree-covered mountain ranges in each of the islands, a large portion of Cuba and Porto Rico has been cleared and cultivated. This is especially true of Porto Rico, which is really an island of farms. Crops grow luxuriantly, partly because of the excellent soil, formed by the decay of the rocks, and partly because of the favorable climate.

The islands are entirely within the tropical zone, so that their temperature throughout the year is high; and on the lowlands neither snow nor frost are known. They receive an abundance of rain, especially upon the northeastern or *windward* slopes, where the damp winds which blow from the northeast first reach the land. The summer is the rainiest season, for then these winds blow with greater strength and steadiness.

Agriculture forms the chief industry of the Cubans and Porto Ricans. The principal crop is sugar-cane, which grows well in the

rich soil and the warm, rainy climate. Although much sugar is raised, the industry has not as yet proved very profitable because of the primitive methods employed and the absence of a good market. Two of the products of the sugar plantations are molasses and rum.

FIG. 210.
A Cuban ox team.

A second important crop is tobacco, for which Cuba is especially noted. There is one district, on the western end of the island, where the rich, limy soil and the climate are peculiarly suited to the growth of the best quality of tobacco. At HAVANA and other places it is manufactured into cigars, which bring high prices — the Havana cigar being considered the best that is made.

Upon the hill-slopes much coffee is produced, and some tea and cocoa. Spices, including nutmeg, cinnamon, and ginger, are products of the West Indies, also pepper, cardamom, vanilla, and pimento or allspice. Such fruits as bananas, oranges, limes, pineapples, and cocoanuts are also produced; but, because of the poor market, in small quantities. Cuba has also some valuable woods, such as mahogany, ebony, and fustic, the latter of which produces a valuable yellow dye.

The conditions in Porto Rico are nearly the same as in Cuba, though it is less wooded than Cuba and more completely cultivated. Along the lower sections, near the coast, sugar and tobacco are raised; the low mountains produce excellent coffee, one of the most important products of the island; and the slopes between these two sections are largely occupied by herds of cattle.

Its principal cities are HAVANA, in Cuba, a city about the same size as Toronto, and SANTIAGO DE CUBA, which is possessed of an excellent harbor. MATANZAS is another important city. PONCE and SAN JUAN are the largest cities in Porto Rico.

Cuba, after the war between Spain and the United States, remained for a time under the government of the latter, but is now independent. Porto Rico is a dependency of the United States.

Jamaica. — South of Cuba lies the Island of Jamaica, the third in size in the West Indies, and a possession of Great Britain. Its capital is KINGSTON. This island is mountainous in the centre, but has an exeellent soil on the lower slopes and in the valleys, and is very produetive. The inhabitants are mainly negroes or mulattoes, there being fully forty negroes to one white person. The women do outdoor work the same as the men.

FIG. 211.
A field of sugar-cane in the West Indies (St. Croix).

The occupation of the Jamaicans is chiefly agriculture. One of the main produets is sugar-cane. Early vegetables and fruits, such as oranges and bananas, are also raised. Jamaica ginger is obtained from the root of a plant that grows in this island.

Haiti. — The first large island discovered by Columbus in 1492 was Haiti, and on it he made settlements and opened mines. The descendants of the Spanish slaves have now become free, after a very complex history, and have set up two negro republics, Haiti and Santo Domingo. The capital of the former is PORT AU PRINCE; and of the latter, SANTO DOMINGO. Many of the natives obtain their living in the most primitive fashion, like the negroes of Africa; but others, especially near the sea-coast, are engaged in raising sugar, tobaceo, coffee, and bananas.

Lesser Antilles. — Most of the islands among the Lesser Antilles are possessions of Great Britain, though some belong to other nations. For instance, Martinique and Guadeloupe belong to France; St. Thomas and St. Croix to Denmark; and others to Holland. Many of these small islands are volcanic cones, built on the crest of a mountain ridge which is mainly beneath the sea. Most of the volcanoes now appear extinct, but occasionally one or other of them bursts forth with terrific results. In 1902 Mount Pelée on the island of Martinique exploded, completely blotting out

the city of ST. PIERRE, and in one horrible blast of red-hot sulphurous ashes and lava destroyed 30,000 people. A similar outbreak took place at almost the same time in the adjoining island of St. Vincent, from the volcano La Soufrière, causing the death of nearly 2000 people. Hot water and steam still rise from the craters in other islands, showing that the volcanic fires have not altogether died out.

FIG. 212.
A tropical scene in the West Indies (St. Croix).

The products of these islands are similar to those of the other West Indies, the most important of all being sugar-cane.

The Bahamas. — North of Haiti and Cuba are several hundred small islands belonging to Great Britain, called the Bahamas. A number of these are inhabited, and on one is situated the city of NASSAU. These islands have been built by coral polyps. In the warm waters of the Gulf Stream, which sweeps over the shallow bank on which the islands lie, these minute sea animals have built reefs. Waves have washed the dead coral fragments together, forming bars and beaches, and the wind has blown the coral sand into low sand-dune hills. In this way the islands have been made.

Sponges are obtained from the clear, warm waters of the Bahama banks. To obtain them, the natives either cruise about in boats, dragging the bottom, or they strip off their clothes and dive into the clear water, tearing the sponge from the bottom to which it is clinging.

From the land, early vegetables, pineapples, oranges, and cocoanuts are raised by the inhabitants, who are chiefly negroes. One of the industries on these islands is caring for winter visitors. Why should people wish to go there ?

The Bermudas

Far out in the Atlantic, alone in mid-ocean, and 600 miles east of Cape Hatteras, is a cluster of small islands, known as the Bermudas, the largest being only fifteen miles long by one or two miles in width. Being in the open ocean, and surrounded by warm currents, the Bermudas have a delightful and equable climate.

Fig. 213.

A field of Easter lilies in the Bermuda Islands.

This group of islands, which belongs to Great Britain, is inhabited mainly by negroes and mulattoes, who are engaged in raising early vegetables, especially potatoes and onions, for export. Another important product is the Easter lily (Fig. 213), great fields of which are raised for the Easter season. It is natural that many persons from colder climates should be attracted to such a climate every winter. The majority of these visitors stay in the largest city, Hamilton. There is a British naval station, with a very large floating dry-dock, on one of the islands.

Review Questions and Suggestions

Mexico. — Questions. — (1) Describe the surface of Mexico. (2) Why are there few good harbors? (3) Tell about the temperature and rainfall in the different parts. (4) Give the history of Mexico: the early settlement; the industries developed; the present government. (5) Mention the leading products from the irrigated farms. (6) Tell about the methods of farming. (7) About the home life. (8) Name some of the plants on the arid plateaus; what products are obtained from the magney? (9) What are the chief products on the damp lowlands? (10) On the slopes farther inland? (11) Tell about coffee raising. (12) In what part of the country are the forests? (13) Name the valuable woods. (14) Name the products of southern Mexico. (15) Tell about the mining of precious metals. (16) Locate the principal cities in the interior; on the coast. (17) Why is there little manufacturing? (18) What kinds are there?

Suggestions. — (19) Find out why coffee raising requires special care. (20) Find an article of furniture made of mahogany. (21) Walk toward Mexico City. (22) What reason can you give for its location? (23) Collect pictures of Mexican scenes. (24) Find some one who has been in Mexico, and have him tell

you about it. (25) Who is the President of Mexico? (26) Make a sketch map of Mexico.

Central America. — QUESTIONS. — (27) Name the six nations in Central America. (28) To whom does Belize belong? (29) What about the earthquakes in Central America? (30) Describe the climate. (31) Locate the leading cities. (32) What products of Mexico are also found in Central America? (33) On the map locate the canal that has been begun across the Isthmus of Panama.

SUGGESTIONS. — (34) What disadvantages do you see in the lack of a central government for all the Central American republics? (35) In what other ways besides saving coal will a canal there prove of advantage? (36) What effect will the building of the canal have on the trade of New York, Montreal, San Francisco, and Vancouver? (37) Why would harbors at each end of the canal be necessary? (38) Make a sketch map of Central America.

The West Indies. — QUESTIONS. — (39) Name the principal islands of the West Indies. (40) Tell about their relief; their climate. (41) What is the reason for the heavy rains of summer? (42) What about the forests and their peculiar products? (43) Name the principal farm products, and tell about each. (44) Why so little manufacturing? (45) Name and locate the chief cities in Cuba and Porto Rico. (46) What can you say about Jamaica? (47) What two republics are on the island of Haiti? Name their capitals. (48) What are its products? (49) How have most of the Lesser Antilles been formed? (50) What is their principal product? (51) How have the Bahama Islands been built? (52) Name some of the products of the islands. (53) For what are the Bermudas noted?

SUGGESTIONS. — (54) Estimate the length and the average breadth of Cuba. (55) How do its two leading cities compare in size with the two largest in Canada? (56) In what respects are the inhabitants of Cuba and Porto Rico similar to those of Mexico? (57) Is the independence of Cuba likely to prove of benefit to it? (58) Make a sketch map of Cuba and Porto Rico. (59) Make a list of the British possessions in the West Indies. (60) What products does Canada exchange with the West Indies? (61) In what way is Canada interested in the Bermudas?

Part III

SOUTH AMERICA

Physiography. — North and South America resemble each other in several respects. The former is triangular in shape and has its main highland masses on the two sides. The western mountains are the younger and loftier, and they have many volcanic cones. They occupy a great breadth of country, the westernmost, or Coast Ranges, rising from the very shores of the Pacific. Between the extensive highlands on the two sides of the continent are low plains stretching from the Gulf of Mexico to the Arctic Ocean.

South America is likewise triangular in shape, broad at the north and tapering toward the south, and its principal highlands are on the two sides (Fig. 214). Those on the west, the *Andes*, form one of the loftiest mountain systems in the world, and between the ranges are included deep valleys and lofty plateaus. Throughout the entire length of the continent these mountains, rising from the very sea-coast, extend inland for a distance of many miles. Many of the highest peaks are volcanic cones, one of them, *Aconcagua*, in Chile, reaching an elevation of nearly 23,000 feet.

On the eastern side of South America the most extensive highlands are those in eastern Brazil. This region consists of ancient rocks, rising in the form of high hills and low mountains. The highest point is little over 10,000 feet. The Guiana highland, between the Amazon and Orinoco rivers, resembles the upland of Brazil and may be considered a part of it, although separated from it by the Amazon lowland. The remainder of the continent is lowland (Fig. 214) and mainly a vast plain extending from southern Argentina to the Caribbean Sea.

In South America, as in North America, the growth of mountains has raised the two sides of the continent and left a depression into which the sea once entered. But waste from the mountains, washed down by rain and rivers, has filled this depression and built the broad plains that are now there. By uplift these plains have been elevated to form dry land.

FIG. 214.

Relief Map of South America.

In two important respects North and South America are unlike in physiography. In the first place, their large rivers flow in different directions. Verify this by a reference to the maps of the two Continents.

A second difference between the two continents is in regard to their coast-lines. It will be remembered that much of the North American coast has been made irregular by the sinking of the land. Much of the South American coast, on the other hand, has been rising. In the former case, many fine harbors were formed; in the latter, the coast-line is made straight because the level sea bottom is being raised. Notice how very regular is most of the western coast of South America. It is the most regular coast-line of long extent in the world; for a distance of 3000 miles there is a general absence of good natural harbors. What effect must this have upon the development of the continent?

Climate. — A large portion of South America lies in the tropical zone and consequently has a hot climate. Where does the Tropic of

FIG. 215.

A view on the arid plateau of Bolivia — a train of alpacas is crossing here.

Capricorn cross the continent? The portion south of this tropic reaches into the south temperate zone, and its climate therefore resembles that of southern Canada. What countries of South America are partly or wholly in the temperate zone? During what months do they have summer? What effect on temperature are their north winds likely to have?

The winds, together with the highlands, are the key to the rainfall. The belt of calms extends across the continent in the neighborhood of the equator. North of this belt the northeast trade winds blow, while south of it is the zone of southeast trade winds. Still farther south are the horse latitudes, and then come the prevailing westerlies which blow across the southern end of the continent.

We may therefore expect heavy rainfall in the vicinity of the equator, where the air is constantly rising. The northern coast must also receive abundant rains because the trade winds come from the ocean and are forced to rise in passing over the slopes. The highlands in eastern Brazil must likewise be well watered by the vapor-laden southeast trades. Of course, these winds lose much of their moisture in travelling across the continent, but on approaching the Andes they are forced to a still greater height; accordingly, the eastern side of these ranges is wet by frequent rains.

South of the belt of calms, both in the trade wind and horse latitude belts, the western slopes and the valleys of the Andes are far too arid for agriculture without irrigation. In this region large areas are veritable deserts. This arid condition is due to the influence of the mountains, which interfere with the trade winds so that the prevailing winds are from the south, and therefore parallel to the coast. Since these winds are blowing *toward* the equator, and therefore becoming steadily warmer, they do not give up their moisture and form rain. Thus there are deserts on the very coast.

Farther south the influence of the prevailing westerlies is felt. In this part of the continent, therefore, it is the *western* side that receives the rain, while the eastern part is dry. In rising over the land these winds cause abundant rainfall in southern Chile; but, being robbed of their vapor as they cross the mountains, they descend as dry winds upon the plains of Patagonia.

The heavy rain in the tropical section of the continent supplies the three great rivers with an abundance of water, and encourages a rank growth of tropical vegetation. But each year, as the season changes, the belts of rainfall migrate northward and southward. Therefore on each side of the equator is a belt where the rainfall varies with the season, being dry at one time of year and well watered in the opposite season. In the rainy season the rivers are flooded, and vegetation grows profusely; but with the dry season the streams shrink in size, and the plains become dry and parched. It is because of this dry period that there are open *savannas*, or grassy plains, both north and south of the equatorial forest. They are called *llanos* in the Orinoco valley, *campos* in Brazil, and *pampas* in Argentina. Here trees cannot survive the drought; but grass is able to mature its seeds during the rainy season, then dies down to the ground and remains dormant until the next period of rains.

Plant and Animal Life. — In the warm, rainy belt the great humidity and high temperature are favorable to an extraordinary growth of plant life. So dense are the vast jungles of the Amazon

that travel through them is almost impossible, in fact, much of this forest wilderness has never been explored.

In the desert of the west coast, on the other hand, plant life is very scanty. There are some parts, for instance the desert of *Atacama* in northern Chile, where, as in other desert sections of the world, there is almost no life of any kind.

In those sections where the climate is cool and the rainfall moderate, as on the mountain slopes and in the south temperate zone, the land is forest-covered. The extreme southern part of the continent has a climate so cold that the plants become dwarfed, as is the case near the tree line in northern Canada.

In the tropical forest there is a great variety of tree-dwelling animals, among which are many insects and beautiful birds. Among the larger

Fig. 216.

Tropical vegetation in the damp lowlands of Ecuador, where there are heavy equatorial rains. The boats are dugouts, that is, logs hollowed out in boat form by the natives.

animals may be mentioned the fruit-eating monkey, the fierce jaguar (Fig. 217), which preys upon other animals, and the sloth, a creature which sleeps suspended, back downward, from the branches of the trees. There are also many reptiles, including serpents, and the iguana, a tree lizard often several feet in length. Some of the serpents are small and poisonous; others, like the boa constrictor, are large and powerful enough to crush a deer in their coils. The boa, coiled among the trees awaiting its prey, resembles a vine.

The beautiful butterflies and ants are most noticeable among the insects. Among the most interesting insects are the termites, commonly called white ants, which live in colonies and build houses of earth. With so many insects there are naturally numerous species of insect eaters. One

FIG. 217.

Animals of South America.

of the most interesting of these is the ant-eater. Its long claws are adapted to digging the ants from their earthy or woody dwelling places, while its sharp-pointed snout and long tongue aid it in finding and devouring its food.

Besides these animals there is the tapir, five or six feet in length, which wanders about at night, feeding along the watercourses; and the armadillo, a burrowing animal protected by an armor. When attacked by an enemy, the armadillo rolls itself into a ball, enclosing its soft under parts In the river waters and swamps are fishes, turtles, and alligators. The turtle eggs and fish are among the principal foods for the forest Indians. Here also is found the manatee, or sea cow, a mammal that has become adapted to life in the water. It lives both in fresh and salt water, and ascends the Amazon even as far as Ecuador.

On the open plains, herds of deer roam about, and also the rhea, — often called the American ostrich, — one of the few large running birds. It lives on the open plains, as in Patagonia, where are also found herds of guanaco, a kind of wild llama.

Among the crags and peaks of the Andes dwells the condor (Fig. 217), the largest of the flying birds — so large that it kills and carries off small deer. In the mountain valleys live the llama and its allies, the vicuna and alpaca (Fig. 215), both wild and domesticated. Like other mountain dwellers, the llama is sure-footed on the rocks, and is thus of great use as a beast of burden; and the cold climate causes it to have a thick coat of wool which is of value to man. Because of its usefulness the llama is sometimes called the American camel.

The People. — When South America was discovered by Columbus, it was inhabited solely by red men. Of these many were typical savages; and even at the present day some of the forest Indians are savages, living solely upon fish, game, and the abundant fruits. It is unsafe for white men to go among them, and, indeed, there are forest tribes which still practise cannibalism.

FIG. 218.
A cannibal girl from the tropical forest of Peru.

Along the coast and some of the large rivers the red men found by the early explorers were more advanced. Like most of the North American Indians, they were in lower stages of barbarism. In a crude way they cultivated the soil and manufactured a few simple implements. Many


Longitude West 60° from Greenwich
CARIBBEAN SEA
ATLANTIC OCEAN
PACIFIC
BARBADOS (To Gt. Br.)
TRINIDAD (To Gt. Br.)
Port of Spain
Delta of the Orinoco R.
Pt. Gallinas
Barranquilla
Cartagena
Colon
Puerto Cabello
La Guaira
Caracas
Barcelona
Orinoco R.
Ciudad Bolivar
VENEZUELA
Georgetown
Paramaribo
Cayenne
BRITISH
GUIANA
DUTCH
FRENCH
Sierra Parima
Sierra Pacaraima
Bogota
COLOMBIA
Popayan
LLANOS
EQUATOR
Mouths of the Amazon R.
Para (Belem)
Maranhão
Ceara
C. St. Roque
Parahiba
Pernambuco
Maceio
Bahia
Rio Negro
Yapura R.
Manaos
Santarem
ECUADOR
Guayaquil
Gulf of Guayaquil
Chiclayo
Amazon R.
SILVAS
Jurua R.
Purus R.
Madeira R.
Tapajos R.
Xingu R.
Araguay R.
Tocantins
Parnahiba R.
BRAZIL
Falls
Huanaco
Pasco
Lima
Callao
PERU
Cusco
Puno
Titicaca L.
Mt. Sorata
Mt. Illimani
BOLIVIA
Mollendo
Arequipa
Tacna
Oruro
Sucre
Potosi
Santa Cruz
Trinidad
Matto Grosso
Cuyaba
Goyaz
PLATEAU OF BRAZIL
São Francisco R.
Serra dos Almores
Diamantina
Ouro Preto
Campos
Petropolis
C. Frio
Rio de Janeiro
São Paulo
Santos
Iquique
Tarija
TROPIC OF CAPRICORN
Autofagasta
Concepcion
PARAGUAY
Asuncion
Villa Rica
Pilcomayo R.
Salta
EL CHACO
Tucuman
Copiapo
Corrientes
Paraguay R.
Parana R.
Guapore R.
Mamore R.
Beni R.
Ucayali R.
Maranon R.
Napo R.
Orinoco R.
EQUATOR

FIG. 219.

MAP QUESTIONS.—(1) In what zone does South America lie? (2) Trace the coast-line of the continent, pointing out the important islands, capes, and bays. Compare the eastern with the western coast-line. (3) Draw a map of South America and locate upon it the mountains and the rivers. (4) Trace the course of the Amazon and its tributaries. Estimate the extent of the river-basin. (5) What other large rivers drain the continent? Compare the rivers that flow eastward with those that flow westward. (6) Point out the large lakes. (7) Locate on the map the various countries, noting the boundaries of each. In each case locate the capital. (8) Which country has the most railways? (9) Compare the locations of Buenos Ayres, Rio de Janeiro, and Valparaiso. (10) Name and locate the large cities of the continent.

Indians in the more remote districts still live in this primitive way, though large numbers have mixed with the white settlers and adopted their customs.

But among the Andes, especially in Peru, Bolivia, and Ecuador, the Spanish explorers found tribes of Indians, under control of the Incas, who had developed far beyond their neighbors; indeed, they had reached the early stages of civilization. The temperate climate of their mountain-valley homes favored advance. And the protection from the inroads of their more savage neighbors which the arid country and mountain barriers offered gave them the opportunity to develop arts and to advance in other ways.

The Spanish, encouraged by the discovery of rich deposits of gold and silver, seized almost all of South America except Brazil, which was settled by the Portuguese. They treated the aborigines with great cruelty, especially the Incas, whom they robbed of their treasures and reduced to slavery. As in North America, the Spaniards intermarried freely with the Indians, so that the present inhabitants of South America are to a large extent of mixed blood. The introduction of negro slaves has led to a still greater mixture of peoples. Therefore, while there are still pure-blooded Indians and negroes, and also pure-blooded white men, especially Spanish and Portuguese, the greater number of the South Americans are a mixture of two or more of these very different races.

Spain maintained her control in South America for fully three hundred years. But in the early part of the nineteenth century the colonies revolted and established themselves as independent republics. They were led to fight for their independence chiefly because of oppression by the Spaniards, who treated their colonies merely as sources of wealth. Brazil also became independent of Portugal, and, after being for a long time ruled by an emperor, established a republic in 1889.

Of late there have been many immigrants from European countries, especially from Germany and southern Europe. Special inducements have been offered to such colonists, and the recent development in portions of South America, particularly in Argentina and southern Brazil, has been partly due to these immigrants.

Brazil

Physiography and Climate. — This is the largest country in South America. While extending north of the equator on one side, it extends into the south temperate zone on the other side. How

many degrees of latitude does it include? Since so large a part of Brazil is in the torrid zone and on the eastern slope of the continent, its climate is not only warm, but moist. Why the latter?

Eastern Brazil is a highland of ancient mountains worn down to the condition of hills and low mountains. Numerous streams drain this upland in various directions. Point out some of these. Trace the divide between those flowing into the Amazon and Parana and those flowing into the Atlantic.

The northern third of Brazil is mainly a vast level plain, throughout most of its extent occupied by dense forest and drained by the Amazon. The rainfall in the Amazon valley is so heavy and the slope of the land so gentle, that the Amazon and its larger tributaries are swollen to great breadth. At times of flood the rivers overflow the surrounding country and transform it to an immense swamp, through which many branching channels extend. In places the Amazon is several miles in width, and resembles a great lake rather than a river. Boats are able to pass up the river nearly to the base of the Andes, a distance of 2200 miles from the sea-coast. Some of the tributaries are also navigable. Along the route of navigation there are settlements, such as MANAOS, which is reached by ocean steamers; but at a distance from the river there is nothing but an almost unknown wilderness.

FIG. 220.

Some of the Indians of tropical South America. Notice the nose and lip ornaments.

The Tropical Forest. — The Amazon forest offers a typical illustration of the tropical forest, where plants, encouraged by the uniformly high temperature and great dampness, grow luxuriantly in the rich soil. Not only is the rainfall heavy, but evaporation is retarded by the dense vegetation, so that the forest is reeking with moisture. Consequently at night time, when the temperature falls, such heavy dews collect that the plants are wet by them as by a rain.

One of the features of such a forest is the dense gloom and the silence, broken now and then by the crash of a falling tree, or the sorrowful notes of birds, or the frightful howling of monkeys, or perchance the shrill scream of an animal which has fallen a prey to the boa. Why might we expect the animals in large part to be tree dwellers?

To one whose home is in the temperate zone the tropical forest appears very strange, for the woods are much the same throughout the year. There is no time when all the trees send forth their leaves and blossoms; nor is there a time when all the leaves change and fall to the ground. Some of the trees blossom throughout the year; others have their blossoms at regular seasons; thus flowers and fruit may be seen at all times of the year.

Products of the Forest. — Among the trees of the tropical forest are many useful kinds. Some produce gums, such as *caoutchouc*, from which rubber is made; or edible fruits and nuts, or valuable timber and dye-woods. In fact, the name *Brazil* is derived from a word applied to a dye-wood found in the Amazon forests.

Fig. 221.
An Indian hut on the Amazon.

Many of the inhabitants near the rivers, who have partially adopted the customs of civilization, make long journeys into the forest to collect the products, both for their own use and for shipment down the Amazon. But the difficulties of travel and the warmth and dampness of the climate are opposed to much work. Therefore the resources of this part of Brazil are only partially developed.

The natives still cultivate the *mandioca*, which was one of their principal sources of food when white men appeared. This plant has beneath the soil an enlargement of the root which in shape resembles a long sweet potato. A dish of dry meal, or *farina*, made from the mandioca is commonly seen on Brazilian tables, and it is often stewed with beans. Mandioca bears much the same relation to these people that wheat bears to those who live in temperate climates. It is from this plant that *tapioca* is made. The Indians are also engaged in obtaining *rubber*, a product of immense importance because of its many uses, for example, as a packing around the valves of machinery, and as an insulator around wires and cables. Name other uses of rubber.

Coffee Raising. — The coffee tree is a native of Abyssinia in Africa. It was introduced into Brazil in the eighteenth century, and has proved so successful that Brazil now produces more than one-half of all the coffee raised. Coffee is cultivated all the way from southern Brazil to the Amazon, and there are fully five hundred million coffee trees in Brazil alone.

Other Industries in Brazil. — On the highlands of Brazil, where coffee raising is carried on, other crops are also produced, such as cotton, sugar, tobacco, fruit, and corn. Much cocoa is cultivated in the tropical section, and in the extreme south many cattle are raised. The rocks of the highlands have produced some valuable minerals, especially gold and diamonds. Indeed, at one time, the southern part of Brazil was the principal diamond-producing region in the world. Both coal and iron are also present, though they are not yet extensively mined.

Cities. — The capital and largest city of the republic is RIO DE JANEIRO. It is situated upon a fine harbor and is surrounded by excellent farming country and coffee plantations. Several other Brazilian cities are seaports, connected with the interior by short railway lines which bring the coffee and other products for shipment. The most important are BAHIA, SANTOS, the seaport of SAO PAULO, and PERNAMBUCO, the chief port for the export of sugar and cotton. On the Para River, near the mouth of the Amazon, and connected with it by a branch of the river, is PARA, from which most of the rubber, vanilla, and other products from the Amazon forest are shipped to North America and Europe.

ARGENTINA

Physiography and Climate. — This is by far the most advanced of South American countries, and the reasons are not difficult to understand. In the first place, Argentina extends from just within the torrid zone to the extreme southern end of South America. Thus the country is for the most part within the temperate zone, the climate of which favors the development of energetic people. Also the *range* of climate, from arid to rainy, and from tropical to temperate, insures a considerable range of products. A second reason for rapid advancement is the fact that, while there are mountains in the west, the remainder of the country is largely one vast expanse of *pampas* (Fig. 222). These open, treeless plains

have made it easy for settlers to move about and to carry on the industries of farming and ranching. Such favorable conditions have served to attract many immigrants from Europe, and there is, therefore, a larger percentage of pure-blooded whites here than in other parts of South America.

Cattle Raising. — The open plains are well adapted to ranching, and it is estimated that there are nearly 100,000,000 sheep and 25,000,000 cattle in this country.

Farming. — The climate and soil in many parts of Argentina are favorable to agriculture. In the warm northern portion sugar-cane, coffee, and tobacco are produced; in the more temperate part, where the rainfall is sufficient, grains and alfalfa are raised. There is also

FIG. 222.
On the pampas of Argentina.

much fruit raising, especially grapes, from which wine and raisins are made.

Wheat is the most important agricultural product, the value of the crop being fully $50,000,000 a year, making the Argentine plains one of the great wheat-producing sections of the world. The climate is favorable, the soil fertile, and the land level or gently rolling. Agriculture in the extreme south is prohibited by the cold; but sheep raising is carried on even in Patagonia and on the stormy islands beyond the Straits of Magellan.

Manufacturing and Commerce. — Besides the industries mentioned above, there is some lumbering and mining in the mountainous portion. But although the words *Argentina* and *Plata* mean silver, their use as proper names comes from the fact that the natives wore silver ornaments, rather than from any abundance of the white metal in Argentina.

In the large cities there is much manufacturing, largely connected with the raw products of the country, as, for instance, dairying, woollen mills, flour, sugar, wine, and cotton manufacturing, the preparation of hides, etc. Nevertheless, a large part of the raw products is sent abroad, particularly wool, sheepskins, hides, wheat, corn, and meat. On the other hand, machinery, cloth, and other manufactured articles must be imported.

With such a development of the resources it is natural that there should be means of ready transportation. The broad Parana River, which empties into the Plata estuary, offers extensive water connection with the interior; and railways ramify the well-settled portions of the country, connecting all the important cities. In fact, because of the superior development of Argentina, there are more railways here than in any other South American country.

Cities. — By far the most important city is BUENOS AIRES, which is the largest city in South America. Buenos Aires is a busy and rapidly growing city with much manufacturing, especially flour milling, brewing, and the canning and preserving of meat. It also has an extensive commerce. Just below the city, on the Plata estuary, is the seaport of LA PLATA; and up-stream, on the Parana, is the rapidly growing city of ROSARIO, which is an important railway centre as well as a river port. In the interior are a number of towns and cities, among which the railway centre, CORDOBA, is the largest.

URUGUAY AND PARAGUAY

Uruguay. — Like so much of Argentina, this is a region of plains, well watered and excellently adapted to agriculture. Naturally, therefore, cattle and sheep raising are important industries. But although the climate and soil are favorable to the same crops that thrive in northern Argentina, there has been little progress in agriculture. Indeed, quite in contrast to its neighbor Argentina, this country is but slightly developed. The government is very bad indeed, for a few men control the army and make and unmake presidents almost at will.

The principal products of Uruguay are those connected with cattle and sheep; namely, dried beef, corned beef, ox tongues, hides, tallow, horns, sheepskins, and wool. The famous Liebig extract of beef is made in this country. The company disposes of more than a thousand cattle a day during the summer months, and exports

tongues, canned meats, beef extracts, and other products, to the value of $15,000,000 a year.

The capital and largest city is the seaport of MONTEVIDEO, situated at one end of a semicircular bay on the Plata estuary.

Paraguay. — Like Bolivia, this little country is without a sea-coast, though it has access to the sea by way of the Parana River. It is a region of hills and plains covered with forests in part, but with many tracts of pasture land upon which large herds of cattle feed. The climate is hot and dry, with most of the hot winds from the north. Fortunately most of the rain falls during the hot summer, when the ocean winds blow toward the heated land.

The agricultural products are those of the warm temperate and tropical zones, including tobacco, rice, sugar-cane, and oranges, while

FIG. 223.
Ranch-houses on the plains of Uruguay.

from the forests rubber, dye-woods, and valuable timber are obtained. There is but one railway, which connects the capital, ASUNCION, with Montevideo on the sea.

A peculiar product, and the principal export of this country, is *yerba maté*, or *Paraguay tea*. Although not used as extensively as our tea, which comes mainly from China and Japan, it is very popular in South America, where its use was learned from the red men.

THE GUIANAS AND VENEZUELA

The Guianas. — North of Brazil are three small countries, the only portions of the South American continent now under control of European nations. They belong to Great Britain, Holland, and France, respectively, and are known as *British Guiana*, *French Guiana*, and *Dutch Guiana*, or *Surinam*. Find the capital of each. Gold is obtained in each of the Guianas, although the development

in this direction has gone little farther than the washing of gravels.

In these small countries a large part of the surface is still a forest wilderness inhabited chiefly by Indians who have little contact with white men. This tropical forest, like that of the Amazon, which it closely resembles, supplies rubber and valuable timber; but its resources are only slightly developed. Near the coast, however, there is a strip of cultivated land from which is obtained sugar-cane, bananas, cotton, and a few other products. Of late, especially in Dutch Guiana, attention has been turned to the production of cocoa and coffee.

The Guianas are so slightly developed that there is but one short railway, and in most sections there are almost no roads. There are

FIG. 224.

A cocoanut grove on the northern coast of South America.

practically no exports except sugar, molasses, and rum — all made from sugar-cane. Flour, clothing, and other manufactured articles are imported.

Venezuela. — This country includes one of the spurs of the Andes and also a portion of the Guiana highland. But a large part of Venezuela is occupied by the broad plains of the Orinoco valley. Some of these plains, the treeless *llanos*, are the seat of extensive cattle raising, as in the case of the pampas of Argentina. In parts of Venezuela are vast forests which produce valuable dye-woods and rubber. Among the mountains are found rich mineral deposits, especially gold. Venezuela is also noted for its extensive pitch lakes, from which asphaltum is obtained for use in making asphalt pavements. The asphaltum oozes slowly from the ground, and as it is dug out, more oozes out, as if there were an inexhaustible supply beneath the surface.

There is some agriculture. Hardy crops, like potatoes, beans, and barley, are raised even at altitudes of 8000 feet; but below 5000 feet are found such semi-tropical and tropical products as sugar-cane, bananas, cocoa, and coffee. The latter is the chief export; in fact, Venezuela is one of the leading coffee-producing sections of South America.

The capital, CARACAS, five or six miles from the sea, is situated upon a highland over 3000 feet above sea-level. It is connected with its port by a short railway line which winds about in its descent to the sea.

In 1812 Caracas was ·ed by one of the most terrible earthquakes ever recorded. It being ·sion Day, a great part of the population was at church. The first ·ock caused the bell to toll, but after all danger was thought past, there came a terrible subterranean noise, resembling a rolling of thunder, but louder and longer. Then came a shaking of the earth so tremendous that churches and houses were overthrown and the inhabitants buried beneath their ruins. On that day fully 12,000 persons perished.

TROPICAL ANDEAN COUNTRIES

Points of Resemblance. — These countries, Colombia, Ecuador, Peru, and Bolivia, are all crossed by the lofty Andes and are therefore mountainous. Each of them extends eastward beyond the mountains, to the plains of the upper Amazon and Orinoco valleys. In Colombia these plains include a portion of the llanos. Elsewhere the plains are covered with a dense tropical forest resembling that of the Amazon in density of plant growth and in human inhabitants.

There is, of course, great variety of climate in this section. Tropical heat prevails throughout the lowlands; but the heavy rainfall near the equator contrasts strikingly with the arid conditions of southern Peru and northern Chile, which lie in the belt of southeast trades.

The elevation due to mountains and plateaus also causes differences in climate. This may be illustrated by the vegetation. Up to an altitude of 3000 to 4000 feet, bananas, sugar-cane, cocoa, and other plants of hot climates flourish. Above this, to an elevation of 6000 or 7000 feet, the cooler climate permits the growth of tobacco, corn, and coffee. From this height up to about 10,000 feet, wheat and our northern vegetables and fruits do well; but above 10,000 feet the bleak mountain peaks are too cold for farming. There is therefore a great variety of farm products in western South America.

The fact that this section is so mountainous furnishes an explanation of its importance in the production of minerals. Both gold and silver ores, and other minerals as well, are found from the northern to the southern limit of the Andes, and this is therefore one of the great mineral-producing regions of the world. It was the abundance of precious metals which attracted the Spanish to the continent.

None of the capitals of the Andean countries are on the coast, and several are in the interior at a considerable elevation above sea-level. In choosing such sites the Spaniards have had the example set them both by their Spanish ancestors and by the Incas; for Cuzco, the capital of the Incas, and Madrid, the Spanish capital, are both at a considerable elevation above sea-level and many miles from the coast. The principal objects in the selection of these sites are to be near the mines, to secure a cooler and more healthful climate, and to obtain protection from attack by sea. Doubtless another reason why these cities are not on the coast is the absence of good harbors. Throughout almost its entire extent, except in the cold southern portion of Chile, the coast is wonderfully straight. Even in the present century the coast has risen several feet in a part of Peru and Chile. This uplift occurred during earthquake shocks, and it was, without question, the slipping of the rocks that caused the shocks.

Colombia. — It is in Colombia that several of the Andean ranges terminate, so that the western part of the country is very mountainous. Here there is much mineral wealth, gold and silver being of most importance, though emeralds of excellent grade are also obtained. In the eastern portion of the country, on the other hand, are treeless llanos, on which large numbers of cattle are raised, as in Venezuela. Coffee is the principal agricultural product and the chief export; but sugar-cane, tobacco, and cocoa are also produced. On the mountain slopes the grains, fruits, and vegetables of temperate climates are grown.

FIG. 225.
A native village on the Panama Railway.

BOGOTA, the capital and largest city, is situated far in the interior and at an elevation of about a mile and a half above

sea-level. It has an agreeable climate, even though within the tropics.

Ecuador. — Why should this name, the Spanish for equator, be applied to this country? In the Andes of Ecuador there are many volcanoes, including *Cotopaxi*, the loftiest active volcano in the world, and *Chimborazo*, which is still higher but no longer active.

Naturally, because of its position, this country has a hot, damp climate near sea-level, but is much more temperate on the mountain slopes. The principal occupations are cattle raising and farming. The chief farm products are wheat and barley on the highlands, and coffee, sugar-cane, and *cocoa* on the warm lowlands. The last named is the most important product of Ecuador, and fully one-fifth of all the cocoa produced in the world comes from that country.

Another product of Ecuador, and of some other South American countries, is *sarsaparilla*. The rubber industry is also well developed; and, now that the accessible supply from wild trees is becoming exhausted, attention is being given to the planting of rubber trees.

Even in the cities there is practically no manufacturing. One of the reasons for this is the almost total absence of roads, making the transportation of heavy machinery very difficult. This fact also interferes greatly with mining operations among the mountains. Therefore, although there is much gold and silver, mining is as yet slightly developed.

QUITO, the capital of Ecuador, is situated among the mountains of the interior at an elevation of about 9000 feet. But the largest city is the seaport GUAYAQUIL, the westernmost of the large cities of South America.

Peru. — The broad, forest-covered plains on the eastern side of the rugged Andes are drained by some of the larger headwaters of the Amazon, and thus Peru is provided with water communication to the Atlantic. While much of this dense tropical forest is an almost unexplored wilderness, the mountain valleys are settled, mainly by the descendants of the Incas.

In Peru there are not only variations in climate due to altitude, as in Ecuador and Colombia, but also great differences in rainfall. The heavy fall of rain on the eastern side of the Andes offers a striking contrast to the arid and even desert climate along their western slopes. State the cause of this aridity once more. So little rain falls in southwestern Peru that in some parts, even close by the sea, there is an average of but one shower in seven years.

Peru was one of the most valuable sources of gold and silver for the Spanish conquerors. The Incas who dwelt there had accu-

mulated gold for ornament, and this the Spaniards seized. Then, opening mines, they forced the Indians to work as slaves. Since that time vast quantities of gold and silver have been obtained in that country, and valuable deposits of gold, petroleum, and copper have also been found.

There is much agriculture in Peru, the principal crops being corn, wheat, and potatoes among the mountains, and sugar-cane, cotton, tobacco, and coffee in the lower, warmer sections. Even in the arid portion there is some farming, as the rains and snows of the mountains supply water for irrigation in the valleys and on the narrow coastal plains. Thus, even in the desert, there are some gardens, vineyards, and fields of cotton and sugar-cane.

FIG. 226.
A Peruvian Indian.

Cinchona, or *Peruvian bark*, from which the valuable medicine *quinine* is obtained, was known to the Incas and is still an important Peruvian product. It is obtained from an evergreen tree, whose leaves resemble those of the laurel.

Before the year 1879 Peru was making rapid progress; but by a war with Chile at that time the nation became almost paralyzed. Although there is some manufacturing, especially connected with sugar production, most manufactured articles must be imported.

LIMA, the capital, founded by the Spanish conquerors in 1535, is situated at the base of the Andes. CALLAO, the seaport of Lima, is about seven miles from the capital. Its harbor is but little more than an open roadstead partially protected by an island on the southwest side. However, since the winds and ocean swells are from the south, while the coast is practically never visited by storms, this slight protection is sufficient.

AREQUIPA, at an elevation of 7000 feet, is separated from the sea by sixty miles of desert. CUZCO, the old Inca capital, is on an interior tableland, at an elevation of over 11,000 feet. The ruins of the Inca citadels and "palaces" are still to be seen, and many pure-blooded and half-breed Incas still dwell in and near the city.

Bolivia. — This country, named after General Bolivar, the great South American leader in the revolt against Spain, was robbed of its

sea-coast by Chile. In a broad valley between the mountains is Lake Titicaca (Fig. 227), partly in Peru and partly in Bolivia. This lake, the greatest in South America, is a third as large as Lake Erie; and its elevation, 12,500 feet above the sea, makes it the most elevated great lake in the world.

The Incas occupied this region also, and mined much gold. Besides gold the Spanish discovered veins of copper, tin, and silver, so that mining has been one of the most important industries of the country. It is said that over $3,000,000,000 worth of silver has been secured since the Spanish discovery. Bolivia is also one of the great tin-producing countries of the world.

FIG. 227.

An Indian boy on a rush boat on Lake Titicaca. The fact that rushes are still used in making boats shows how these people cling to ancient customs.

The mining and reduction of the ore are done by very crude methods. For example, instead of using costly machines for crushing the ore, one method is to roll boulders around on the ore. Since there are practically no railways, goods are transported for the most part by trains of pack-mules, donkeys, alpacas, or llamas. The llama here, as in Peru, is of great value to the inhabitants, not merely as a beast of burden, but also as a source of wool for clothing.

Much of eastern Bolivia, like eastern Peru and the Amazon valley, is an almost unknown forest wilderness. But in the mountain valleys and on the plateaus agriculture is carried on, with products similar to those of Peru. Most of these are consumed at home, though some coffee is exported.

Better railways, and the improvement of the rivers so as to permit river transportation to the Atlantic, are among the greatest needs of the country. Through what rivers could boats pass to the sea? Find the capital of Bolivia. LA PAZ, the largest city, has twice as many inhabitants as the capital.

CHILE

Physiography and Climate. — Since the divide between the Atlantic and Pacific drainage forms the eastern boundary line of Chile, the country is very narrow in an east and west direction. It is also

very mountainous (Fig. 228). Except in the south, the coast line is regular, like that of the rest of South America.

The climate varies more than that of any other South American country. The northern part is within the torrid zone; while the southern end reaches far into the bleak south temperate zone; and on the mountain slopes there is every climate from frigid to torrid. Moreover, northern Chile is arid and in places an absolute desert; but central and southern Chile reach into the rainy belt of prevailing westerlies. The best-developed section lies in the middle part, between the hot, arid north and the bleak, rainy south. This part of Chile is bathed by a cold current from the south, which cools the air.

Mineral Wealth. — There is much mineral wealth, including lead, silver, coal, and copper. The latter is of such importance that Chile

FIG. 228.
Snow-covered mountains of Chile.

is one of the great copper-producing countries of the world. There are also beds of nitrate of soda which at present yield the government an annual income of fully $10,000,000. Nitrate is the principal export.

The nitrate beds occur in the midst of the desert of Atacama, in which rain very seldom falls. The substance occurs in layers a few inches to one or two feet thick, over an area thirty or forty miles in breadth. In color it varies, according to the impurities contained. After being dug out, the pure nitrate is dissolved and separated from the impurities, and then sold. Its chief use is that of a fertilizer, for which purpose great quantities are shipped from the port of IQUIQUE.

Agriculture, Manufacturing, and General Development. — There is much agriculture in Chile, especially in the rainy middle portion.

The principal crops are the various grains, tobacco, and vegetables. More wheat and barley are produced than are needed at home, so that Chile helps to supply other nations with grain. Large herds of cattle are also reared, and sheep raising is one of the chief industries in southern Chile. Hides, shoe leather, and wool are exported. More manufacturing is carried on than in most South American countries, the principal kinds being flour milling, cheese making, canning, and shoe manufacturing; but as elsewhere on that continent, machinery and many other manufactured articles are purchased from foreign countries.

Chile is one of the most progressive countries in South America. Its government is stable, and its industries are well developed. This progress is doubtless in large part due to the temperate climate, which requires energy on the part of its inhabitants, and invites settlers from the temperate climate of Europe. It is interesting to note that the two most advanced nations of South America lie side by side in the temperate zone.

Cities. — The principal cities are SANTIAGO, the capital and largest city, situated inland, and VALPARAISO, its seaport. As at Callao, the harbor of Valparaiso is open to the north; but the wind seldom blows from that quarter.

ISLANDS NEAR THE CONTINENT

The *Galapagos Islands*, about six hundred miles west of Ecuador, on the equator, are a group of small volcanic islands owned by Ecuador. They are too far from the continent to show on our map.

Just east of the southern tip of South America are the *Falkland Islands*, which belong to Great Britain. Still farther east are the islands of *South Georgia*, also British. Just off the coast of Venezuela, opposite the mouth of the Orinoco, is the low island of *Trinidad*, also a British possession. A great deal of the asphaltum used in Canada comes from Trinidad. West of Chile, and belonging to that country, is the island of *Juan Fernandez*. This is the island where Alexander Selkirk was wrecked, and by some is thought to be the island home of Robinson Crusoe. It seems quite certain, however, that Defoe described Tobago, just north of Trinidad.

REVIEW QUESTIONS. — (1) State some resemblances between South America and North America. (2) Describe the highland regions. (3) The lowlands. (4) In what respects do North and South America differ? (5) Tell about the differences in temperature in different parts of South America. (6) Explain the regions of heavy rainfall. (7) Where are the arid belts? Give the reasons. (8) What about the rainfall in the south? (9) Why does the rainfall vary with

the season in the tropical belt? (10) What differences in the plant life are found in South America? Why? (11) Tell about the animals of the tropical forest. (12) Of the plains and mountains. (13) Describe the Indian life in the forest. (14) What can you tell about the Incas? (15) State the main facts in the history of South America since the whites came. (16) Describe the principal physiographic features of Brazil. (17) What are the variations in climate? (18) Tell about the influence of rainfall upon the vegetation and the rivers. (19) Describe the tropical forest of the Amazon. (20) What valuable products are found? (21) What can you tell about mandioca? (22) Tell about coffee raising. (23) What other products come from Brazil? (24) Name and locate the principal cities; what can you say about each? (25) Describe the physiography of Argentina. (26) What influence have the physiography and climate had upon development? (27) How does ranching in Argentina differ from that in Canada? (28) What are the principal farm products? (29) Tell about manufacturing. (30) About commerce. (31) How does Argentina differ from many other South American countries? (32) Compare Buenos Aires with Montreal and Winnipeg. (33) Locate the other cities named. (34) What are the industries of Uruguay? (35) Name the capital. (36) Compare Uruguay with Argentina. (37) What about the climate and products of Paraguay? (38) Name the three Guianas. (39) What are the conditions and products? (40) Describe the physiography of Venezuela. (41) What are the principal industries? (42) What can you tell about Caracas? (43) Name the Andean countries. (44) Tell about the climate, its variations, and influence on the farm products. (45) What about the minerals? (46) What was the influence of the Spaniards? (47) Give reasons for the locations of the capitals. (48) Describe the physiography and industries of Colombia. (49) What about the capital? (50) Tell about the effect of climate on the industries in Ecuador. (51) Name the products. (52) Why is there little mining and manufacturing? (53) Locate the principal cities. (54) Tell about the physiography and climate of Peru. (55) About the minerals and agricultural products. (56) Locate and tell about the principal cities. (57) What about the large lake in Bolivia? (58) Tell about the mining. (59) The other industries. (60) The transportation of goods. (61) Describe the physiography of Chile. (62) The climate. (63) Name the mineral products. (64) What other industries are developed? (65) Why is Chile so progressive? (66) Locate the largest cities. (67) Locate the island groups mentioned.

Suggestions. — (1) Give several reasons why South America has been much less rapidly settled than North America. (2) What parts of North America have been rising and on that account possess few good natural harbors? (3) How does the Spaniards' treatment of the Incas compare with their treatment of the North American Indians? (4) Find out some of the ways in which coffee is often adulterated. (5) Make a sand model of South America; a drawing. (6) If you were expecting to emigrate there, where would you prefer to settle? Why? (7) What products of South America are you probably seeing and using from week to week?

FIG.

Relief Map

Fig. 229.

Relief Map of Europe.

PART IV

EUROPE

I. PHYSIOGRAPHY, CLIMATE, AND PEOPLE

THE continent of Europe was named when only the southern part of it was known; that is, the portion that is separated from Africa and Asia by water. On Figure 229 find what these bodies of water are called. As exploration extended, it was found that Europe was really continuous with Asia, being in fact a great peninsula extending westward. Europe and Asia together actually form a single continent called *Eurasia;* but since Europe has been long considered a separate continent, and has figured so prominently as the home of the civilized races, it seems best to treat it separately.

On the map (Fig. 236) trace the boundary between Europe and Asia. Make an outline map, inserting the boundaries and names of the European countries. Add the names of the seas and the larger islands. What countries are partly or wholly on peninsulas? Add to the map the large rivers with their names. Where are the chief divides? Mark with heavy lines the location of the principal mountains (Fig. 229). Write their names on the map. From what has previously been learned, what can you tell about the people of Europe? About the climate? What does the peculiar condition of the Caspian Sea tell about the climate in that section?

PHYSIOGRAPHY

Highlands and Lowlands. — As in the case of North America, the development of the continent of Europe has required millions of years. Far back in time mountains appeared above the sea in the northwestern portion of the continent. Although greatly worn by the weathering of the ages, and much reduced in elevation, these mountains may still be seen in Finland, Scandinavia (the peninsula occupied by Norway and Sweden), and Scotland (Figs. 241 and 278),

as well as in Germany and Belgium. They resemble the mountains of eastern North America that have likewise been greatly worn by weathering.

Other mountain ranges were later formed in southern Europe; but, like those of western America, they are young and their recent growth has been vigorous. Therefore the *Pyrenees* (Fig. 264), *Alps* (Fig. 301), and *Caucasus* (Fig. 230) are still of great height. Find each on Figure 304. The mountains of North and South America form continuous chains, with the highest ranges in the west, extending north and south. But in Europe the loftiest moun-

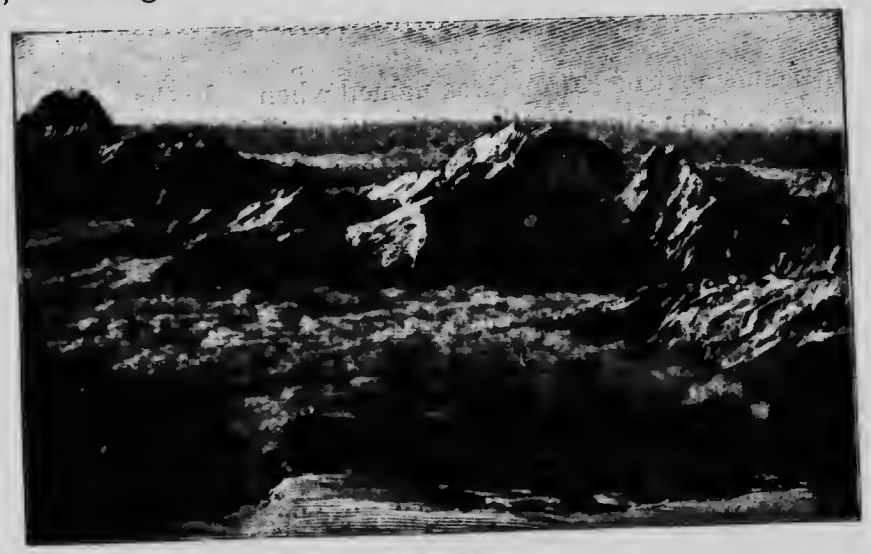


FIG. 230.

A view over the snow-capped peaks of the Caucasus Mountains. A sea of fog fills the valley.

tains are in the south, extending in various directions, though mainly east and west. How does this condition promise a different effect on the climate? It is to the fact that the mountains are not continuous, and that they consist of chains extending in various directions, that Europe owes much of its extremely irregular outline.

Besides the mountains mentioned, there is a long, low chain, known as the *Urals*, which extends north and south on the eastern side, and for a part of the distance forms the boundary between Europe and Asia. Other scattered highlands are shown on Figure 229. Where mainly are they situated?

Next to the Caucasus (Fig. 230) the loftiest of all these mountains are the Alps (Figs. 298, 300–302), the rains and snows of which find their way to the sea through several of the large rivers of Europe. What are some of their names (Fig. 236)? Headwaters of four of these rivers are within

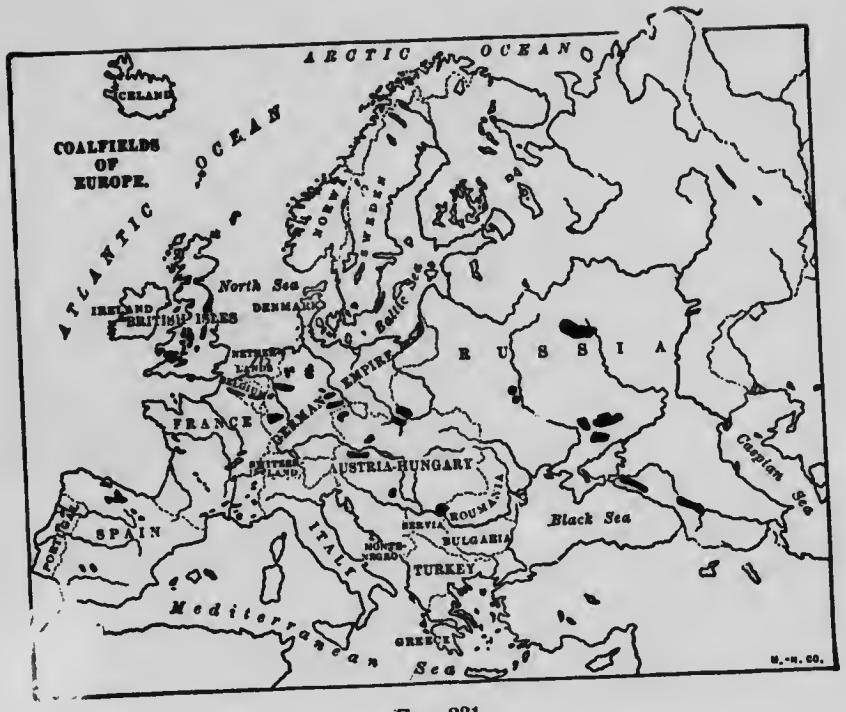


FIG. 231.
Coal map of Europe.

FIG. 232.
The ice sheet of Europe.

forty miles of each other in the Alps. What large rivers of Europe do not rise in the Alps (Fig. 229)?

Between the low mountains of the north and east and the higher ranges of the south there is a very extensive lowland (Fig. 229). A part of this has been submerged by the sinking of the land, thus forming the shallow Baltic Sea. Beginning in the west with southern England, and passing through Belgium and Holland, or the "Low Countries," this plain broadens as it extends eastward across Germany (Fig. 233), until it includes almost all of Russia (Fig. 229). Estimate its length east and west. About two-thirds of Europe is included in this plain.

Fig. 233.

Looking across the level plain of north Germany. Peat is dug on this plain near the river.

Coal Beds. — While these mountains and plains were forming, coal beds were also accumulating, as was the case in America during the *Coal Period*.

Figure 231 shows the parts of Europe in which coal beds occur. In what countries are they? Most of the coal is *bituminous* or soft coal, though there is some *anthracite*. In a number of sections *lignite*, or brown coal, is mined; and *peat* (Fig. 233) is also dug for fuel in western Europe, where the damp climate favors its formation.

Fig. 234.

A *fjord* on the coast of Norway — a mountain valley into which the sea has been admitted by sinking of the land. See also Fig. 278.

The Great Ice Sheet. — At the same period that eastern North America was invaded by a great ice sheet from the north, snow accumulated on the highlands of northwestern Europe and spread outward in all directions. Figure 232 shows the extent of the European ice sheet.

The Coast Line. — The irregularities of the coast line of northern Europe, like those of northeastern North America, are due to the sinking of the land. The Baltic Sea and its gulfs represent old land valleys; and the hills of this submerged land form either islands, peninsulas, or shallow banks where food fish abound.

It is well proved that, before the Glacial Period, the British Isles were connected with the mainland by low plains where the North Sea and English Channel now exist. An elevation of only a few hundred feet would restore this condition by changing the bed of the North Sea to dry land. This would then extend the continent westward beyond the British Isles, thus destroying the bays and harbors, and altering the entire outline of northwestern Europe.

In southern Europe the rising and sinking of small areas of land — while the mountains were forming — has made many peninsulas, with bays, gulfs, islands, and seas between. The Mediterranean itself occupies a basin, thousands of feet in depth, formed by the sinking of this part of the earth's crust. Some of these islands, however, are partly or wholly built up by volcanic action. What volcano is on the island of Sicily (Fig. 293)?

Climate

Influence of Latitude. — Trace the 50th parallel of latitude on a globe or map of the world. Notice that while the 49th parallel forms the southern boundary of western Canada, it passes entirely south of England, crosses France near Paris, and extends through southern Germany and Russia. From this it is evident that by far the larger part of Europe lies due east of Canada and farther north than the United States. St. Petersburg is in the same latitude as northern Labrador; and the tips of the peninsulas of southern Europe reach about as far south as the southern boundary of the state of Virginia in the United States.

In the far north, near the Arctic, the climate is bleak, and there are barren, frozen tundras. South of this is a belt of fir, spruce, and pine, like that which stretches east and west across central Canada. But contrary to what might be expected from latitude alone, the climate in and just south of this belt of evergreen forest permits the growth of the grains and fruits that flourish in southern Canada and northern United States. In southern Europe such semi-tropical fruits as oranges, lemons, olives, and figs are cultivated. That is to

say, the products of the greater part of Europe are such as grow several hundred miles farther south in eastern North America.

That these products are raised in great abundance in Europe is indicated by the number of people there; for, although the continent is much less than half the size of North America, it supports four times as many inhabitants, or nearly 400,000,000. Let us see the explanation of these remarkable facts.

Resemblance to Western North America. — In several respects the climate of Europe is so similar to that of western North America that a brief review will be useful.

The prevailing westerlies are felt in northern Europe as in western North America. Blowing from the ocean, and, what is especially important, from across the warm ocean current, they distribute an enormous amount of heat over the land. It is the westerlies from these warm waters, more than any other factor, that allow crops to be raised nearer the pole in Europe than in any other part of the globe. If these conditions were not present, much of that densely populated continent would be barren waste, like the peninsula of Labrador.

The effect of the ocean winds is naturally greatest near the coast, as in western North America. Therefore England has a mild, rainy climate; but the farther eastward one goes, the less is the influence of the ocean. Thus eastern Russia experiences great extremes of heat and cold, and there is danger of serious droughts. Compare the summer and winter temperature (Figs. 39 and 40) and the rainfall (Fig. 235) of these two sections.

Southern Europe is not affected by the westerlies in summer, for it then lies within the belt of the horse latitudes. This accounts for the fact that southern Spain, Italy, and Greece receive very little rain in summer. Examine Figure 235 to see where in Europe the rainfall is light. Find some places where there is abundant rain on mountain slopes.

Influence of Cyclonic Storms. — Thus far we have seen a striking resemblance in the climates of the two continents. But there are also notable differences. The westerlies are less regular in Europe than in western North America because of frequent interruption by the cyclonic storms, which, after passing over eastern North America, often cross the ocean and continue across Europe. Why cannot their arrival be predicted as well as in Canada and the United States?

As in eastern Canada and the United States, the cyclonic storms cause variable winds (Fig. 30). For example, when a storm centre is west of the British Isles the westerlies are checked and the winds blow toward the centre, or *from the east*. But while storm winds from the east bring rain to eastern North America, the same kind of winds cannot bring rain to eastern Europe, because there is no great ocean near at hand to supply the vapor. On account of the absence of ocean water, therefore, eastern Europe has little rain, as eastern America would have if there were land instead of water to the east of it.

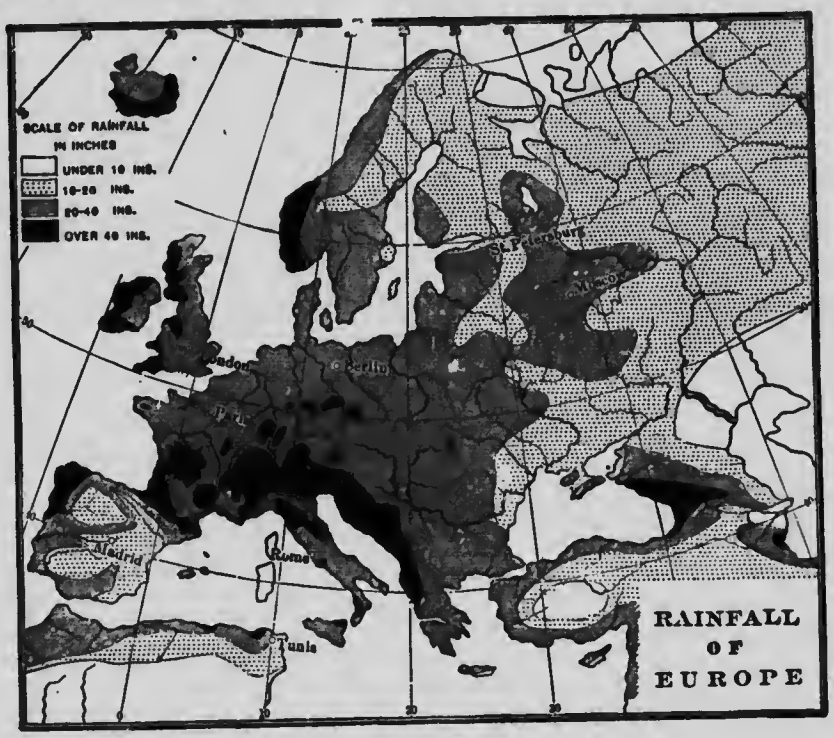


FIG. 235.

Effect of Mountain Ranges. — The direction in which the highlands extend is another cause of great difference between the climates of Europe and America. In America, where high mountains extend north and south along the entire western margin of the continent, the warm, damp westerlies are soon deprived of their moisture. This leaves a vast arid and semi-arid area in the interior.

In Europe, on the other hand, where the higher ranges extend nearly east and west, the mountains do not so seriously interfere with the movement of vapor to the interior. Consequently the west winds surrender their moisture only very gradually. This accounts for the fact that in the belt of westerlies, from western Ireland to eastern Russia, there is rainfall enough for agriculture.

The east-west direction of the lofty mountains has a marked influence on the climate of those portions of Europe that lie on their north and south sides. Rising like great walls, the mountains prevent south winds from bearing northward the heat of the Mediterranean basin; and they also interfere with the passage of the chilling winds from the north.

Inland Seas. — The numerous inland seas are another great factor in influencing the climate of parts of Europe. Draw a sketch map of Europe, locating these seas. How does the Mediterranean compare in length with Lake Superior? It will be remembered that our Great Lakes produce a marked influence on the climate of the neighboring land, moderating the heat of summer and the cold of winter. It is this influence, added to that of the mountain barrier, that gives to southern Italy, Greece, France, and Spain such an equable and semi-tropical climate. How must these seas influence the rainfall?

People

The people of Europe have never been bound closely together as one great nation with common interests. One of the important reasons for this is the fact that so many parts of the continent are quite detached from all others. Spain, for example, is not only a peninsula, but it is separated from France by a high range of mountains. The British Isles are entirely cut off by water; Scandinavia nearly so; and Italy itself is bounded on the north by lofty mountains, and by water on all other sides. It is natural that people living in such isolated positions should not feel a common interest with those who are so separated from them. Thus have arisen many different customs, beliefs, and languages.

In consequence of such differences and lack of common interest there are many more nations in Europe than in North America. Count them (Fig. 236). There have been many jealousies and disputes between them which have been settled by war, and their boundaries have been subjected to numerous changes, as one nation or another has seized territory during war. Notice also how irregular are some of the boundary lines. Those of Germany, for example, have been determined only after the loss of tens of thousands of human lives.

Plants and Animals. — The vegetation of Europe is similar to that of North America. The continent, however, has been so long inhabited by civilized races that large areas are cleared and under cultivation. Extensive forests exist all over the country, more especially in the mountainous regions.

FIG. 23

MAP QUESTIONS: *Norway, Sweden, and Denmark.*—(1) What is the length of the Scandinavian peninsula in degrees? In miles? (2) Compare the coast-line of Sweden with that of Norway. (3) Compare the western coast of Norway with the western coast of Scotland. (4) What evidence is seen of glacial action in these countries? Where? (5) Compare the surface of the Scandinavian peninsula with that of Denmark. (6) What

FIG. 236.

do you observe about the rivers of Sweden? (7) Which of these three countries has the greatest population? (8) How does it compare in population with England? With Ontario? With your own Province? (9) What points in North America are in about the same latitude as Christiania and Stockholm? (10) Locate the principal cities and towns.

FIG. 237.

Some of the few wild animals of Eur[illegible]

There are not many wild animals at present in Europe, although a few, such as the wild boar, bear, and wolf are found in some parts of the continent. The reindeer and the chamois are still numerous, the one in the northern sections of the country, the other among the Alps (Fig. 237). The ibex is also found among the mountains. The domestic animals, including the reindeer, are abundant. Even the bear is tamed and exhibited.

REVIEW QUESTIONS. — (1) Give reasons for and against treating Europe as a separate continent. (2) Tell about the highlands. (3) The lowlands. (4) The coal beds. (5) The Ice Age. (6) Locate the boundary of the ice sheet (Fig. 232) on Figure 236. (7) Tell about the coast line in northern Europe. (8) In southern Europe. (9) Of what advantage is the irregularity of the European coast? (10) Give the latitude of northern and of southern Europe. (11) How about its vegetation? (12) Its population? (13) Remembering its latitude, explain the mild climate of Europe. (14) How are its regular westerlies interfered with? (15) How is the east and west direction of its mountain ranges of great importance? (16) What is the influence of its inland seas? (17) Give some reasons why Europe is divided into so many nations. (18) Mention some of the wild animals of Europe.

SUGGESTIONS. — (1) What results might follow if the mountains of Europe extended north and south near the western coast? (2) What disadvantages do some of the European countries suffer in consequence of the east and west direction of the mountains on their southern boundaries? (3) Mention some of the results if the land should rise near Gibraltar, changing the Mediterranean to a closed sea. How would the British Isles be influenced? Also Italy? (4) In what section would you expect to find the most wild animals? (Fig. 303.) (5) Give reasons why some European countries, such as Germany, take much better care of their forests than Canadians do. (6) Can you tell about any of the great wars and great generals of Germany, Great Britain, or France? (7) Can you tell of any of the changes in boundary lines; for example, in Poland, or between France and Germany?

II. GREAT BRITAIN AND IRELAND

Position, Size, and Importance. — London is in almost the same latitude as Winnipeg, and the British Isles themselves are in the same latitude as Labrador. England is smaller than Manitoba; and the British Isles, including England, Wales, Scotland, Ireland, and several hundred small islands, are not quite one-half as large as Ontario.

Yet in spite of their northern position and small area, the largest city in the world is located in the British Isles. More than that, Great Britain has more manufacturing (with one exception), more foreign trade, a greater number of vessels upon the sea, and more colonies (Fig. 255) than any other nation in existence. There are of course reasons for these remarkable facts, and we shall next look for them.

Inhabitants. — The British people doubtless offer one important explanation of the above facts. Being so near the mainland the islands have been invaded by many hardy people, among them the Romans, and afterwards the *Angles* and *Saxons*, from whom the words *English* and *Anglo-Saxon* have been derived. The *Normans* also entered Britain, and from the union of these two peoples, the Anglo-Saxons and the Normans, have sprung the present race of Englishmen. The people of the Highlands of Scotland, Wales, and Ireland are for the most part descendants of the *Celts*, the earliest inhabitants of the islands of whom we have any certain knowledge. France, Holland, Germany, in fact all the nations of Europe, have contributed from time to time to the population of the British Isles, so that we may say that the British people are probably the most mixed race in the world to-day.

FIG. 238.
Ancient cottage near the Lakes of Killarney in Ireland.

Although formerly divided into different nations, England, Wales, Scotland, and Ireland are now united to form the *United Kingdom* of Great Britain and Ireland. The inhabitants of each of these sections are noted for their energy, intelligence, and high ideals, which in no small measure account for their success as a nation.

Physiography and Climate. — The southwesterly winds from over the warm ocean also partly account for the greatness of the British Empire. Two days out of three these winds blow across the British Isles; and, since they have traversed a vast expanse of warm water, they greatly temper the climate. Indeed, the winter season is milder than that in southern Canada, and the summer is cooler (Figs. 39 and 40).

The prevailing westerlies, carrying an abundance of moisture, so distribute it over the islands that no section suffers from drought. Yet the western portions receive more rain than the eastern, because the ocean winds visit them first (Fig. 239).

The highlands also influence the rainfall. A highland rim extends around Ireland (Fig. 247), giving to the surface of that island the form of a shallow plate. How does that influence the rainfall (Fig. 239)? Highlands are also found in Wales, western England, and most of Scotland (Figs. 240 and 245).

As already stated (p. 262), the mountains of Great Britain, like those of eastern Canada, are so old that they are worn very low. While this upland is rarely more than one or two thousand feet above sea-level, there are occasional peaks of hard rock that rise to a greater height. For example, the granite peak of Ben Nevis in Scotland, the highest point in the British Isles, is forty-three hundred feet in elevation. The Scottish Highlands (Fig. 241) are for the most part very rugged and barren.

Where the rocks are softer and less disturbed by folding there are lower and more level tracts, or plains. Point out on Figures 240, 245, and 247 the broadest plains of Ireland, Scotland, and England. Notice especially the narrow lowland of southern Scotland, near Edinburgh and Glasgow. There the rocks are so much softer than those of the Highlands that instead of a barren, hilly country there is a fertile lowland, upon which there are many thriving industries.

What have you already learned about the Great Ice Age in the British Isles? As in northeastern North America, the glaciers had an important effect upon the soil and caused many lakes (Fig. 248). Explain how.

The coast line is very irregular, as may be seen from the maps (Figs. 240, 245, and 247). How does the coast compare with that of eastern North America? You have already learned that this irregularity is due to sinking of the land; and that the many islands are the crests of former hills, while the bays and harbors are submerged valleys. Since the mountainous western portion had more deep valleys for the sea to enter than the level plains of the east, there are more good harbors on the west coast than on the eastern side of the islands. On both sides, however, the mouths of the larger rivers usually make good ports. Why?

Agriculture. — In connection with agriculture, much live stock is raised. In fact, grazing has of late so increased in importance that there is now twice as much land in pasture as in crops, and the British Isles are noted for their great number of fine cattle, sheep, and horses. The importance of grazing is partly explained by the fact that much of the surface is too rocky or mountainous to be cultivated (Fig. 241). Besides this, some of the plains in eastern England, although too sterile for farming, make excellent pasture land. Two other facts favorable to stock raising are the mild winters and the damp atmosphere which encourages the growth of grass. In addition to these causes, the cheapness with which grain is raised in other countries, such as Canada, the United States, Russia, and India, and transported to the British Isles on the large steamships, has made it less necessary for the people to raise grain.

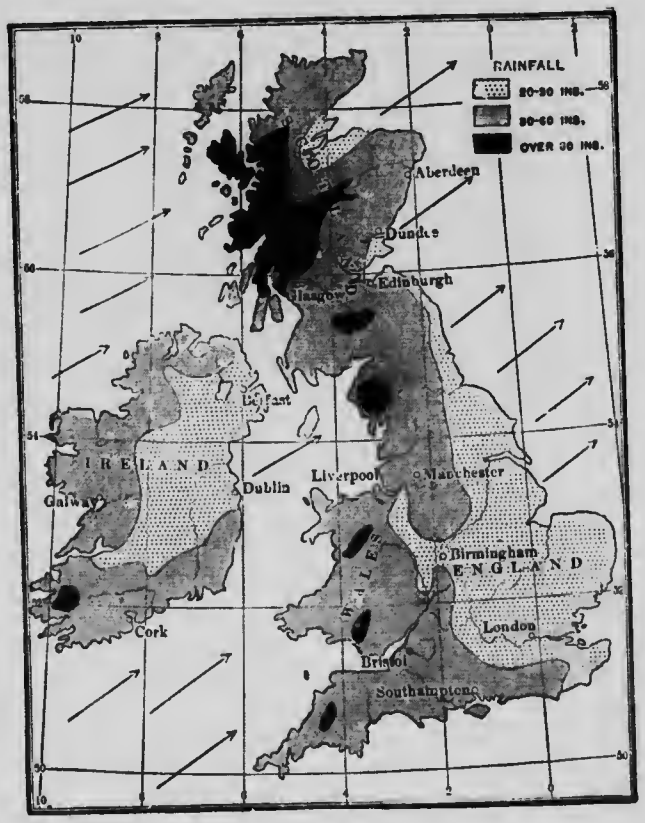


FIG. 239.

Rainfall map of the British Isles.

Several of the smaller islands are also widely known for live stock. For instance, the Shetland Islands are famous for Shetland ponies; and on the three Channel Islands, — Jersey, Guernsey, and Alderney, — near the French coast, three famous breeds of cattle have been developed.

The cool summer climate, which is of advantage in some respects, is unfavorable to many kinds of farming; for example, it prevents the production of corn, cotton, tobacco, and grapes, which require warm summers. More hardy products, however, as oats, barley, and

FIG. 241.
Pasture land in the Highlands of Scotland.

wheat, are extensively cultivated. Turnips, potatoes, beans, and peas are other important crops; also hops, which, together with barley, are used in the manufacture of beer. Owing to the many towns and cities, truck farming is of importance.

The demand for farm land has been so great that large areas of swamp have been reclaimed by careful drainage, and these now make the most fertile farms. But in spite of the care that has been given to cultivating the soil and to raising live stock, far less food is produced than is needed by the inhabitants. Such vast multitudes are engaged in other occupations that if they were deprived of food from abroad, they would, it is said, begin to suffer from famine within a month.

Fishing. — Since the early inhabitants had to cross the sea in order to reach these islands, and since most of their descendants have lived either on or near the coast, it is natural that, as a people, they should become accustomed to a seafaring life. This sort of life has also been encouraged

FIG. 240.

MAP QUESTIONS.—(1) Draw a map of England, locating the highlands and chief rivers. (2) Estimate the area of the country. Compare this with Canada. (3) Trace the coast-line, noting particularly the bays. Compare the bays on the eastern, southern, and western coasts. (4) Note the location of the principal harbors. (5) Compare the locations of London, Hull, Liverpool, Manchester, Bristol, Portsmouth, and Plymouth. (6) Locate the islands off the coast of England. (7) Point out the principal mining, manufacturing, and agricultural districts. (8) Trace the principal lines of railway, noting the most important cities and towns on each line. (9) Name and locate the cities and towns on the coast. On the rivers. In the interior. (10) From the geographical position of England what would you expect its climate to be?

by the fact that food fish abound on the shallow banks of the North Sea and of the ocean to the north and west of the islands. More than one hundred thousand men and twenty-five thousand boats from the British Isles are employed in the fishing industry. Among the fish caught are cod, haddock, and herring, as off the coast of Nova Scotia and Newfoundland. Another important kind is a flat-fish, the sole. Salmon enter the rivers of northern Great Britain, and oysters are found along the southern coast. *See page 124.*

Many fishing hamlets are scattered along the shore; but the fishing industry here is becoming more and more centralized in the large towns, which possess the capital for large vessels and expensive fishing outfits. The chief centres of the trade are LONDON, HULL, and GRIMSBY in England, and ABERDEEN in Scotland.

FIG. 242.
A cottage in southwestern England.

Mining.—One of the resources of the British Isles which early attracted people from southern Europe was the tin in southwestern England. This metal is not mined in many parts of the world, but has always been in great demand; and even before the time of Cæsar, ships from the Mediterranean came to England to obtain tin for use in the manufacture of bronze. Small quantities of copper, lead, zinc, and even gold and silver ores have also been discovered in the British Isles, but at present there is almost no mining of these metals.

On the other hand, there is an abundance of coal and iron in Great Britain. Most of the coal is bituminous, but that in South Wales is mainly anthracite. None of the iron ore is far from coal; and in places the same shaft is used to bring both coal and iron to the surface. Limestone is also abundant and near at hand. What sug-

gestions do these facts give concerning the development of manufactures and the location of large cities?

Besides these minerals, various building stones are extensively quarried, as granite in Scotland, and slate in northern Wales. Salt is also found; and there is clay of such excellent quality for earthenware that several towns have become noted for their potteries. The extent of the mining industry in the United Kingdom is indicated by the fact that there more than half a million persons are employed under ground.

FIG. 243.

A map showing the coal fields of the British Isles. Why are so many of the large cities on or near the coal fields?

Reasons for Development of Manufacturing. — Considering the abundance of coal and iron ore on the one hand, and of wool from the millions of sheep on the other, it is clear that Great Britain is able to manufacture extensively. Even in very early times the English were engaged in the weaving of woollen cloth. Later, owing to numerous wars and to the oppression of rulers on the continent, England became a refuge for oppressed industrial people from the mainland, so that such manufacturing rapidly increased.

The hilly sections of the country have abundant water-power due to the glacier. This also favored manufacturing; and later, when steam was employed, the abundant stores of coal were of great importance. The use of steam has led to the building of many factories, and to the growth of manufacturing centres. Therefore, the making of cloth on hand looms at the homes of the weavers has been generally abandoned.

The peculiar energy and inventive genius of the British, which kept their machinery in advance of that used by other nations, must also be

considered. For example, it was the Scotsman, James Watt, who invented the modern steam engine; and it was George Stephenson who invented the first locomotive. The very smallness of the country is another advantage; for no matter where a factory may be located, it is near the coal fields and within a few miles of a shipping point.

FIG. 244.

A castle in Wales, situated on one of the hills of hard rock.

Woollen and Cotton Manufactures. — In the mountainous section of northern England, near both coal and wool, are hundreds of factories engaged in the manufacture of woollen cloth. The principal centre of this trade is LEEDS, which has the added advantage of water-power. On the western side of this hilly region is BRADFORD, noted for its broadcloth and worsted goods; and neighboring cities manufacture woollen yarn, hosiery, carpets, and blankets. The woollen industry extends northward into Scotland and southward to LEICESTER, where the surrounding plains produce a breed of sheep that yields a wool for worsted yarn.

From the spinning and weaving of wool it was easy to move to cotton manufacturing; and on the western side of the northern mountains we find a great cotton-manufacturing industry. Dampness is one of the points in favor of that section, for in a dry air cotton is in danger of becoming too brittle to spin and weave easily.

The centre of the cotton manufacturing is MANCHESTER. What cities do you find situated near by? This portion of Great Britain,

including southern Scotland and the two sides of the mountain range of northern England, is the seat of the greatest textile industry in the world. Can you name cities of Canada and the United States which are likewise engaged in cotton and woollen manufacture?

In spite of the enormous number of sheep in the British Isles, the manufacturing industry has so far outgrown the local supply of wool that millions of pounds must be imported every year. As to cotton, since the climate will not permit its cultivation in Great Britain, it is necessary to import about two billion pounds a year to supply the mills. The raw material is obtained from the southern United States and from Egypt, India, and other parts of the British Empire.

Iron and Steel Manufacturing.—The cities in Great Britain that are most noted for iron and steel products are BIRMINGHAM and

FIG. 246.

The Clyde, at Glasgow. Fifty years ago the river could be forded at this place, but it has been deepened by dredging so that the largest vessels now enter.

SHEFFIELD in England, and GLASGOW in Scotland. BIRMINGHAM manufactures jewellery, watches, firearms, bicycles, steam engines, etc. SHEFFIELD has for centuries been distinguished for cutlery, the existence of grindstone quarries in the neighborhood being a partial reason for this particular industry. Why? It also manufactures steel rails and armor plates for warships. GLASGOW is a centre for shipbuilding and for the manufacture of locomotives and machinery of various kinds.

In cities round about these places are similar works; and many of those occupied with the textile industry also produce textile machinery and other iron and steel goods. The island is so small that coal and iron are cheaply shipped to various points; and on this account, manufacturing, though best developed near the coal fields, is not confined to these districts.

FIG. 245.

MAP QUESTIONS.—(1) Trace the coast-line of Scotland, making a comparison between the eastern and western coasts. (2) Point out the principal islands, capes, and bays on the coast. (3) Draw a map and mark upon it the mountains, lakes, and rivers. (4) Compare the surface of the Highlands of Scotland with that of the Lowlands. (5) Compare the surface of Scotland with that of England. (6) Trace the Caledonian Canal. (7) Point out the principal harbors. (8) Trace the lines of railway. Are these connected with the manufacturing districts? (9) Locate the important cities and towns. (10) Point out some of the more historic spots in Scotland.

Thus we see that here coal makes possible an enormous industrial development. But in spite of the forest of chimneys in England and southern Scotland, the output of coal is more than sufficient to meet the demands. The materials to be manufactured, however, are not sufficient; for all the cotton, much of the wool, and part of the iron ore must be imported.

These three industries, connected with cotton, wool, and iron, have made Great Britain one of the great workshops of the world. The most important is cotton manufacturing; iron ranks next, and wool is third.

Ireland. — Ireland forms a striking contrast to Great Britain in several respects. In the first place, it is mainly a country of farms instead of manufactures. The mild climate and damp atmosphere insure excellent grass throughout the year, and about four-fifths of the farm land is in pasture. It follows, therefore, that great numbers of cattle, sheep, and horses are raised. As in Great Britain, the principal grain is oats; but barley, wheat, potatoes, and turnips are also raised.

Again, unlike Great Britain, Ireland is very barren of minerals. Building stones, such as granite, marble, and sandstone, are found, but there is extremely little coal or iron. For that reason, whatever manufacturing has been developed is found chiefly on the eastern side, where coal is easily obtained from England or Scotland. At one point the two islands are only thirteen miles apart.

The lack of coal for use in the homes is partly made up by the abundance of "turf" or peat. Owing to the deposits of glacial drift, which have obstructed the streams (Fig. 248), the level interior is so poorly drained that marshes or bogs occupy about one-twelfth of the entire surface of the island. The water in these bogs protects the swamp vegetation from decay, so that it accumulates, forming a sod, which, when dug up and dried, makes a fairly good fuel. It will be remembered that similar deposits, in the larger swamps of the Coal Period, caused the coal beds which are now of so much value.

While manufacturing is little developed, there is one kind that flourishes in Ireland, namely, the making of *linen*. The Irish linens, which take high rank in the markets of the world, are made from the inner bark of the flax plant.

The damp climate of Ireland is favorable to the growth of flax, and the cheap labor makes possible the great amount of care required in preparing it for the manufacture of linen. The stem of flax is tall and slender, and

a field of it presents somewhat the same appearance as a field of oats. Instead of being cut like grain, it is pulled up and left lying upon the ground for some time, exposed to the dew and weather, so that the gummy substance, which holds the woody matter and fibre together, may decay. After the fibre has been separated from the woody core by machinery, it is split and combed out with a steel brush and thus made ready for spinning.

FIG. 248.

The famous lakes of Killarney, in the hilly part of southwestern Ireland. They are formed where glacial drift has obstructed the drainage.

Travellers in northern Ireland in summer see field after field covered with flax, which is used chiefly in linen factories at BELFAST. The fibre is made into thread in much the same manner as cotton or wool, and this is then woven into napkins, tablecloths, etc. Name other articles made of linen.

Ireland forms a third contrast to Great Britain in regard to population. Not only is it far less densely peopled, but the number of inhabitants is decreasing. Since 1847 the population has been reduced from 8,000,000 to 5,000,000. The larger number of these have emigrated to America.

Location of Principal Cities. — The cities most distinguished for manufacturing have already been mentioned; namely, LEEDS, BRADFORD, MANCHESTER, SHEFFIELD, BIRMINGHAM, and GLASGOW. What industries are developed in each?

There are other large cities along the coast: for so much manufacturing calls for an enormous import of raw materials and food, as well as the export of manufactured goods. These cities must, therefore, be the gateways to and from the island. And since Great Britain lies rather far north, between Europe and the New World, these shipping points must be located on the eastern, western, and southern sides, at those points where the best harbors exist, and not far from the great industrial centres.

FIG. 247.

MAP QUESTIONS.—(1) Draw a map of Ireland, locating the principal bays on the coast. (2) Compare the coast-line on the various sides of the island. (3) Point out the mountains and the principal lakes and rivers. (4) Point out the Lakes of Killarney and the Giant's Causeway. (5) Compare the locations of Dublin, Belfast, Londonderry, Cork, and Limerick. (6) Trace the railway lines. (7) Compare the extent of the railway system in Ireland with that of the railway system in England and Scotland. (8) Locate the principal manufacturing districts. (9) Point out the more important cities and towns. Note in each case their location. (10) Draw a map of Great Britain and Ireland to the same scale as this map.

First among the coastal cities to be noted is LONDON, with BRISTOL opposite it on the west. Farther north is HULL, with LIVERPOOL on the opposite side; and in southern Scotland is EDINBURGH, near the coast, paired with GLASGOW on the west. On the south side the two most important ports are SOUTHAMPTON and PORTSMOUTH. What are the principal cities of Ireland? Steamships, railway lines, and canals connect the various cities, carrying immense quantities of freight. In Great Britain and Ireland there are nearly four thousand

FIG. 249.

Commerce on the Thames below London Bridge.

miles of canal and over twenty-one thousand miles of railway. The telegraph lines, which form a network over the kingdom, are operated by the government.

London. — This city, the largest in the world, with a population of about 6,700,000, is situated on the Thames River. The Thames, like many other British rivers, has a wide, deep mouth, owing to the sinking of the land, and London is located as far inland as high tide allows vessels to go, or fifty miles from the open sea. The advantage of this position lies in the fact that it is in the interior of the island, yet has direct water communication with foreign countries. The population of Great Britain is large, and London is the point of entrance for much of its food. The city is the greatest shipping point in the world. Its rows of piers extend twenty miles down the river in all directions. Like all the great cities, it has extensive

FIG. 250.

The location of London and of Liverpool.

manufactories, nearly all kinds of goods being made. London is, however, at a slight disadvantage, iron and coal not being so close to hand as it is to some of the other cities.

Besides being the capital of Great Britain and Ireland, and the chief city of the British Empire, London is the centre for the publication of books and magazines, and is provided with noted picture galleries, libraries, museums, and many magnificent buildings. Some of the best known of the public buildings are the British Museum, the Tower of London, the Houses of Parliament, Westminster Abbey, St. Paul's Cathedral, the Mansion House, and the Law Courts. Its

FIG. 251.
Windsor Castle.

wealth and trade are so extensive that it is looked upon as the money centre of the world. The Bank of England is the agent of the government in many of its business transactions, and employs about a thousand persons.

London being a very old city, many of the streets are narrow and crooked. Some of the principal streets are too narrow for street cars, so that the people have to be transported mainly by omnibuses. One of the largest companies runs thirteen hundred buses, and employs five thousand men and fifteen thousand horses. However, an underground railway, which encircles the great city, running under houses and streets, carries an enormous number of passengers.

Near London are many places of interest. Just below the city, on the south side of the river, is the GREENWICH observatory, from which meridians of longitude are numbered and time is regulated. A few miles up the river is the famous public school, Eton, near which is Windsor Castle

(Fig. 251), one of the residences of the king. Find CAMBRIDGE and OXFORD (Fig. 250), the two leading university towns of Great Britain. Find also CANTERBURY and YORK, the residences of the two Archbishops of the established church.

Other English Cities. — Southwest of London, on the coast, is SOUTHAMPTON, where a number of the ocean liners stop, and where fast trains wait to convey passengers to the metropolis. Close to Southampton is PORTSMOUTH, which has a great navy yard. The largest arsenal in Great Britain is at WOOLWICH.

FIG. 252.
The churchyard described in Gray's "Elegy."

Almost due west of London, at the mouth of the Severn River, is BRISTOL, which is engaged in the lumber trade and in the manufacture of tobacco, chocolate, sugar, and pottery. It was formerly next to London in size, but Liverpool has now far outstripped it. Can you suggest some reason why? Near Bristol are CARDIFF and MERTHYR TYDVIL, both noted for their coal and iron mines.

Knowing the occupation of the dense population in northern England, we can tell the principal exports of HULL and LIVERPOOL. What must they be? The former city naturally trades mainly with Europe, and the latter with North and South America and West Africa.

Before the discovery of the New World, the west side of Great Britain had little commerce, and LIVERPOOL (Fig. 250), therefore, had little business or growth. But with the settlement of America the city grew until it now has an immense trade with North and South America, and is the third city in size in the United Kingdom. Its docks cover hundreds of acres and extend for miles along its water front. Besides its commerce, Liverpool is also important for its shipbuilding. What circumstances are favorable to that industry? A ship canal, about thirty-five miles in length, has recently been built to MANCHESTER, at an expense of $75,000,000.

Other important cities are SWANSEA, noted for its copper-smelting; NOTTINGHAM, famed for its lace; KIDDERMINSTER, with its carpet manufactories, and NEWCASTLE, a great shipbuilding and coal centre.

Cities of Scotland. — GLASGOW (Fig. 246), on the western side of the lowland plain of southern Scotland, is not only a great manufacturing centre, but it is also a leading shipping point for the same reasons that Liverpool is. State them. What must be some of its principal imports and exports? Why? The city is famous the world over for its shipbuilding. It is also the seat of Glasgow University.

EDINBURGH, unlike the other great cities named, is neither a shipping point nor an important manufacturing centre. It is distinguished as the capital of Scotland, and as one of the most beautiful

FIG. 253.

Kenilworth Castle, described by Scott in "Kenilworth."

cities of the British Isles. Its importance is historical rather than commercial; for in the early days it commanded the entrance to the lowland of southern Scotland. The well-known University of Edinburgh is situated here. LEITH, a short distance away, is the port for Edinburgh.

Farther north on the coast are the important ports of DUNDEE and ABERDEEN. The former sends forth a number of Arctic whaling vessels each year, and is also engaged in the manufacture of linen. The latter is noted for its shipbuilding and granite works, and also as being the seat of Aberdeen University. Near Aberdeen is BALMORAL, the royal residence in Scotland. PAISLEY is famous for its silk, woollen, and cotton manufactures.

Cities of Ireland. — The principal cities of Ireland are on the east and south sides. Why? What has already been said about BEL-

FAST? It is also noted for its shipbuilding. DUBLIN, the capital and largest city, and the chief port for the English trade, ships farm and other products to England and receives manufactured goods in return. It is a beautiful city, with many handsome public buildings. LONDONDERRY has extensive manufactures, particularly of linen, and has a large export trade. LIMERICK is noted for its manufacture of lace. CORK is the most important city in the south of Ireland, and near it is QUEENSTOWN, which possesses a fine harbor and is a port of call for many of the trans-atlantic steamers.

FIG. 254.

Shakespeare's house at Stratford-on-Avon. Since this picture was taken, the house has been somewhat changed in appearance.

Fuller Reasons for the Greatness of the British Empire.—While we have learned many facts about the British Isles, some important questions are not yet fully answered. For example, why does this little country possess more colonies than any other nation of the earth? Further, why should it have the greatest foreign trade? And why the greatest number of vessels upon the sea?

Some of the reasons in answer to these questions have already been given, but there are others that should be noticed. The fact that Great Britain is so small — it is impossible to find a point more than seventy miles from the salt water — is a reason why many of the British have been sailors. It is not surprising, therefore, that they have produced many explorers and that they are a nation of colonizers. Nor is it to be wondered at that, as the explorers discovered new parts of the world, they laid claim to them in the name of their mother country. In this way, and by war, Great Britain came into possession of Canada, India, Australia, much of Africa, and many other places. At present her territory includes about one-fifth of the land surface of the globe and one-fourth of its inhabitants. These colonies have been governed in such a way as to advance the interests of the colonies themselves, and not merely for the advantage of the mother country. Good sense, honesty, and humanity mark the administration of Great Britain in every quarter of the globe. Point out these colonies on Figure 255. *See Pages 455-469.*

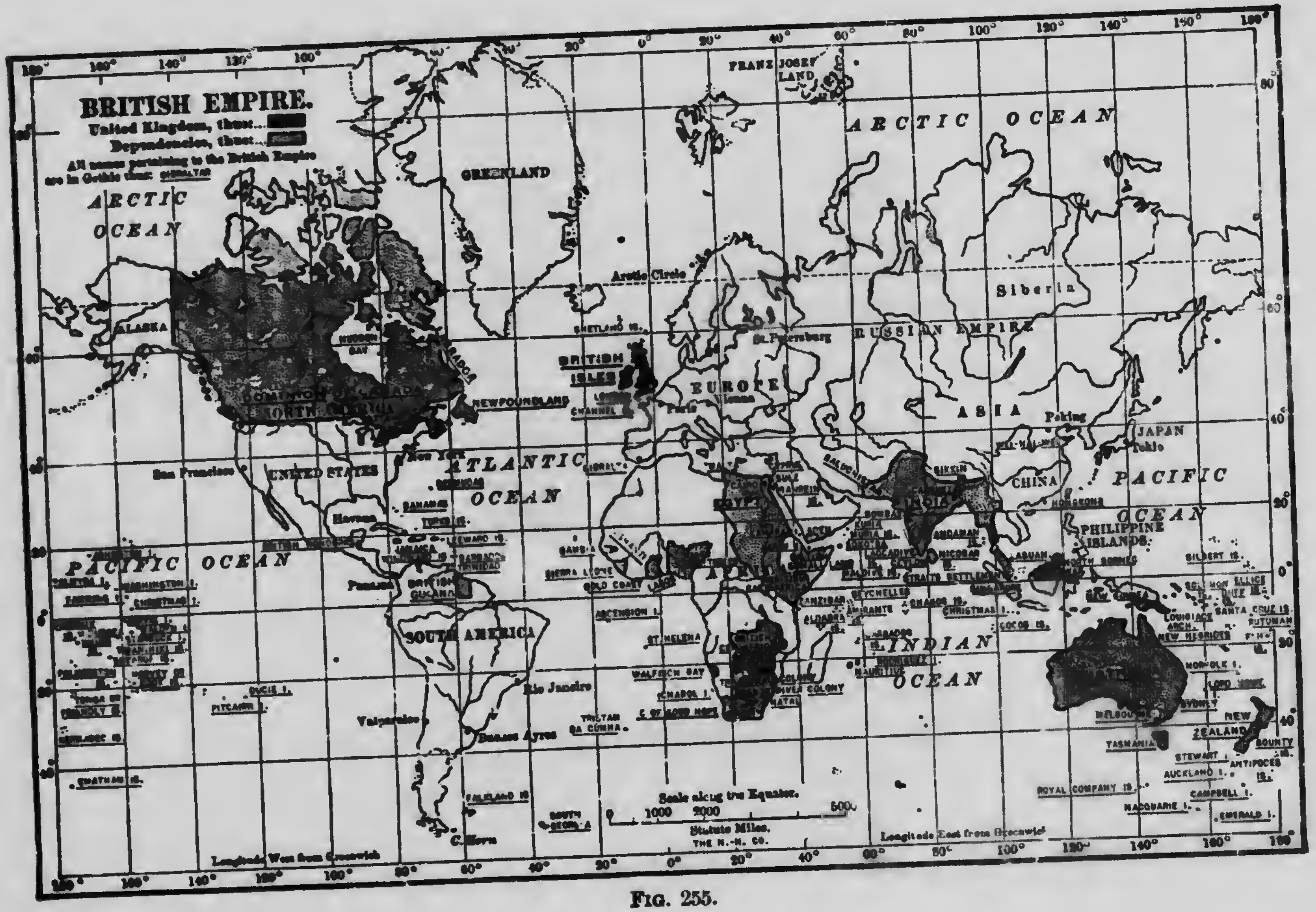

BRITISH EMPIRE.
United Kingdom, thus
Dependencies, thus
All names pertaining to the British Empire are in Gothic thus: GIBRALTAR
ARCTIC OCEAN
GREENLAND
ALASKA
HUDSON BAY
NEWFOUNDLAND
BRITISH ISLES
SHETLAND IS.
Arctic Circle
St. Petersburg
RUSSIAN EMPIRE
Siberia
EUROPE
ASIA
Peking
JAPAN
Tokio
CHINA
HONGKONG
PHILIPPINE ISLANDS
PACIFIC OCEAN
ATLANTIC OCEAN
San Francisco
UNITED STATES
New York
BERMUDAS
BAHAMAS
Havana
JAMAICA
BARBADOS
TRINIDAD
Panama
BRITISH GUIANA
SOUTH AMERICA
Rio Janeiro
Valparaiso
Buenos Ayres
C. Horn
FALKLAND IS.
TRISTAN DA CUNHA
ST. HELENA
ASCENSION I.
SIERRA LEONE
GOLD COAST
WALFISCH BAY
C. OF GOOD HOPE
NATAL
EGYPT
ADEN
BOMBAY
INDIA
CEYLON
ANDAMAN IS.
NICOBAR IS.
SEYCHELLES
ZANZIBAR
CHAGOS IS.
MAURITIUS
INDIAN OCEAN
LABUAN
NORTH BORNEO
CHRISTMAS I.
COCOS IS.
GILBERT IS.
ELLICE IS.
SANTA CRUZ IS.
ROTUMAH
NEW HEBRIDES
NORFOLK I.
LORD HOWE
SYDNEY
MELBOURNE
TASMANIA
NEW ZEALAND
BOUNTY IS.
STEWART I.
ANTIPODES IS.
AUCKLAND I.
CAMPBELL I.
ROYAL COMPANY IS.
MACQUARIE I.
EMERALD I.
FANNING I.
CHRISTMAS I.
TONGA OR FRIENDLY IS.
DUCIE I.
PITCAIRN I.
CHATHAM IS.
SOUTH GEORGIA
Scale along the Equator.
1000 2000 5000
Statute Miles.
THE N.-N. CO.
Longitude West from Greenwich
Longitude East from Greenwich

FIG. 255.

These colonies and dependencies help to explain to a certain extent Great Britain's enormous foreign commerce; for the colonies have on the whole found it more advantageous to trade with the mother country than with other nations speaking a different language and having less understanding of them or sympathy with them. They sell to her their raw products, including food, and she in return sends to them clothing, steel goods, and other manufactured articles.

Great Britain has a greater number of ships on the sea than any other nation. In fishing, exploring, and making settlements, a large number of ships have been needed; and for the proper defence of her widely distributed colonies many warships have been required. Another reason for so large a navy is the fact that the British Isles are cut off from all other nations by water. They must, therefore, rely rather upon warships for defence than upon a standing army.

Fig. 256.

The Houses of Parliament.

Further than this, the British are actually forced to own many ships. Here are over forty million people living on two small islands, from the soil of which it is impossible to obtain the necessary food. They must send ships away for their flour, meat, sugar, coffee, etc.; and they must send abroad for much of their raw material for manufacture. Also, in order to pay for the raw materials and food, their manufactured goods must be shipped to all parts of the world; otherwise their extensive manufacturing would be impossible.

These facts, coupled with the remarkable energy and determination of the British people and their commercial honesty, are the principal reasons why the United Kingdom greatly surpasses all other nations in the number of her ships and in her foreign commerce.

Government. — As the form of government used in Great Britain is that on which the government of Canada is formed, it is not neces-

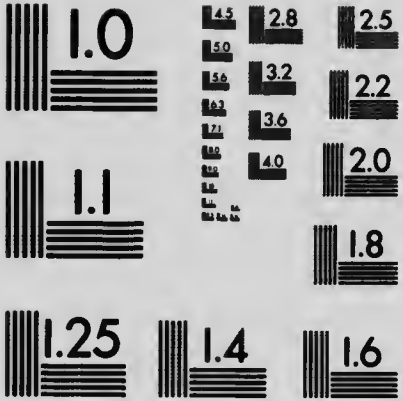
sary to dwell on it. We are also familiar with it from our study of English history. The government is a *Limited Monarchy*, presided over by a *king*, who succeeds to the throne by right of inheritance, but who holds his office at the will of the people. *Parliament* is composed of two bodies, the *House of Lords* and the *House of Commons*. No law can go into force until it passes both these houses and receives the assent of the king.

The House of Lords is composed of Lords Spiritual and Lords Temporal, the former being Bishops of the established church, the latter peers sitting by right of inheritance, election, or appointment. The peers of Great Britain hold their seats by right of inheritance; the Scottish peers are elected for one parliament; the Irish peers hold their seats for life, after election, and there are a few life peers by appointment.

The members of the House of Commons are elected by the people for a term not exceeding seven years. The real power is with this body, as they have entire control of the revenues and expenditure of the kingdom.

The execution of the laws is in the hands of the *Cabinet*, chosen either from the House of Lords or the House of Commons, from the party having the majority in the House of Commons and responsible to that body for their actions. The leader of the Cabinet or government is known as the *Prime Minister* or *Premier*. If the ministers lose the support of the House of Commons, they must resign; and then others are appointed who will carry out the wishes of the people as expressed by their representatives in Parliament.

Review Questions. — (1) Give the location and area of the British Isles. (2) What noteworthy facts about their importance? (3) What about their inhabitants? (4) Tell about their climate. (5) Their physiography. (6) The effects of the ice sheet. (7) The coast line. (8) Why is so much of the land in grass? (9) Tell about the live stock. (10) What crops cannot be raised? Why? (11) What are the principal farm products? (12) What disadvantage do the people suffer in regard to food supply? (13) Give the principal facts about the fishing industry. (14) What metals are found in small quantities? (15) How about the abundance of coal and iron ore? (16) Locate the chief coal-fields in Great Britain. (17) Tell about the iron ore in Great Britain. (18) Name other important mineral products. (19) Give reasons for the development of textile manufacturing in Great Britain. (20) What cities are especially noted for the manufacture of woollen goods? (21) For cotton? (22) Tell about the manufacture of iron and steel goods. (23) What about the farm products of Ireland? What about minerals there? (24) About manufacturing? (25) What is used for fuel? (26) Tell about the linen industry of Ireland. (27) About the population. (28) Name and locate the cities in Great Britain that are distinguished for manufacturing. (29) Name and locate the principal coast cities. (30) Tell about London: its location, principal kinds of business, etc. (31) What noted places are near by? (32) Tell about each of the other cities mentioned. Locate



each. (33) Give some reasons why the British Isles have more colonies than any other country. (34) Why more foreign trade? (35) Why the greatest number of vessels? (36) Tell about their government.

SUGGESTIONS. — (1) On a sketch map of Great Britain mark the position of the highlands and lowlands. (2) Considering the prevailing winds, which side of the great cities must be most free from smoke? (3) Why are sheep able to eat shorter grass than cattle? (4) Make a list of goods made out of flax, and place samples in the school cabinet. (5) Collect pictures of scenes in the British Isles. (6) What books have you read which describe the scenery or the people of these islands? (7) Find out other facts about the large steamships. (8) What advantages do you see in the fact that the British Isles are near the continent, yet separated by water? (9) Read in George Eliot's "Silas Marner" for a description of old-fashioned manufacturing by hand looms. (10) Also in "John Halifax, Gentleman," for an account of the introduction of steam into the factories. (11) Read Scott's "Kenilworth." (12) Find out some facts about Queen Victoria. (13) What do you know about Shakespeare?

III. THE NETHERLANDS AND BELGIUM

MAP QUESTIONS (Fig. 265). — (1) Compare the area of the Netherlands with that of Belgium; with that of Great Britain. (2) Compare the coast lines of the Netherlands and Belgium. (3) What large river crosses the Netherlands? Through what countries does it pass? (4) What countries border the Netherlands? (5) Belgium? (6) Make an outline map of these two countries.

THE NETHERLANDS (HOLLAND)

Physiography. — Figure 257 shows the Netherlands to be a peculiar country. The greater portion is very low, and some parts are as much as fifteen feet below sea level. In fact, if protection against sea and river were not provided, about one-half of the surface would be occasionally or permanently under water. This explains why the country, sometimes called Holland, is more commonly known as the *Netherlands*, a word meaning *low country*.

FIG. 257.
Map to show the portion of the Netherlands that is below sea level.

The Rhine has brought much of the soil; some of it, no doubt, all the way from the Alps. A large part of the country is, in fact, a delta of sand and clay built by the Rhine, and it is so low and level that over much of the surface the only notable elevations are either sand dunes, thrown up by the wind, or glacial moraines of sand and gravel. In Figure 232 notice how far the ice sheet advanced in this section. Hard rocks are found only in the eastern and southeastern parts, where the highest point is a little over a thousand feet.

In so level a country there can be little water power; and little mineral wealth may be expected in the soft clays and sands. Some iron is found in the bogs, which are extensive, and a small amount

of coal is mined in the extreme southeast. Under the circumstances, is there promise of much manufacturing?

Owing to all these disadvantages the Netherlands might seem to be incapable of supporting a large population. Nevertheless that country has over twice as many inhabitants as Ontario, which is twenty times as large.

People and Government. — Perhaps the leading explanation of this prosperity is the high character of the *Dutch* people, as the Netherlanders are called. For centuries they have felt an intense love for civil and religious liberty; but, being a small nation, they have suffered many hardships in attempting to establish independence and

FIG. 258.
A farm scene on the plains of Holland.

tolerant laws. At one time they were under German control; later they came under the cruel rule of Spain; but finally they obtained their independence, and their form of government is now a limited monarchy.

While their belief in freedom brought them untold suffering, it was a cause of progress as well. It was to Holland that the Puritans first fled when religious persecutions drove them from England; and from time to time large numbers of Huguenots, Germans, and others found refuge there. Their settlement in the Netherlands had a great influence on the intelligence with which Dutch industries were developed.

Agriculture. — Agriculture, including grazing, is the principal industry of the kingdom, although, largely on account of swamps and sand dunes, a fifth of its area is waste land. The principal farm products are grains, such as rye, oats, wheat, barley, and buckwheat; also potatoes, sugar beets, beans, peas, and flax. More land is devoted to pasturage (Fig. 258) than to these crops, partly

because much of the higher land is too sandy for cultivation, and partly because the moisture in the lowlands aids in the growth of excellent grass. Cattle, hogs, sheep, and horses are raised in great numbers; and quantities of butter and cheese are made.

FIG. 259.
A Dutch windmill.

There is, of course, good reason why the Dutch have been willing to endure the labor and danger involved in reclaiming large tracts of land from the sea. As the population increased, and the need of new farm land grew, it was found possible to keep the high tides and rivers from overflowing the salt marshes and flood plains. In this way the people have added large areas of fertile land, and have also been encouraged to undertake the even more difficult task of reclaiming the shallow sea-bottom.

Such drainage began in the twelfth century and has continued until the present day. It has already about doubled the area of the Netherlands, and now a scheme is under way to reclaim the Zuider Zee itself (Fig. 257).

The ditches for draining the land really form canals, which, by means of their embankments, enclose houses, gardens, and fields, much as fences or stone walls enclose houses and gardens in other countries. They are so numerous that they extend over the lowlands in a great network.

Manufacturing. — Although there is very little coal or water power in the kingdom, there is an abundance of coal near by in Belgium, Germany, and England. Accordingly, since the people require quantities of cloth, shoes, machinery, etc., they import coal and many necessary raw materials in order to manufacture for themselves. The strangers who fled to the Netherlands to escape persecution did much toward developing early manufacturing, and this industry now ranks next in importance to agriculture.

Commerce. — Commerce is highly developed for several reasons. In the first place, the ditches, built primarily for purpose of drainage,

are also valuable as canals; and these, together with the rivers, make transportation by water very easy to all sections of the country. The flat-topped dikes also make excellent wagon roads; and the level nature of the land renders the construction of tramways and railways a simple matter. Many of the railways connect directly with the European trunk lines.

In the second place, the *position of Holland* gives her a distinct commercial advantage. The Netherlands lie directly in the path of entrance to northern Europe, and the country is crossed by the Rhine River, which is navigable for a long distance into Germany. Therefore much of the trade of Great Britain and America with central Europe is carried on through Holland.

FIG. 260.

A canal in Amsterdam. Notice the peculiar fronts of the Dutch houses.

Colonies. — The Dutch colonies furnish a third reason for an extensive development of commerce. Since the very earliest times the Dutch have been in close contact with the salt water. Not only have they battled with the sea in reclaiming land, but to visit some of their near neighbors they have been obliged to cross it. Moreover, both the Zuider Zee and the North Sea, near at hand, contain many food fish; and this fact has led to development of the fisheries, one of the leading industries of the country.

The men have therefore become expert sailors; and when discoveries of new lands were being made, the Dutch sailors naturally shared in the explorations and established colonies.

The Dutch colonies in North America and South Africa were surrendered to Britain; but Holland retains possession of other important

regions. Of these, Dutch Guiana in South America has already been mentioned (p. 259); but the most important are Java and several other East India islands. The manufacture of raw products from the colonies constitutes one of the principal industries of the coast cities.

The possession of these colonies, Holland's position her water and rail connections with other countries, and her many canals and excellent roads, make the transportation of goods an important industry.

Cities. — AMSTERDAM and ROTTERDAM are the two principal commercial centres. The former, the largest city in the Netherlands, is about twice the size of Toronto. It is connected with the ocean by canal, is noted for its university and museums, as well as its shipping, manufacturing, and diamond cutting. The rulers of Holland are crowned at Amsterdam, the capital, although the royal family resides at THE HAGUE, where the government buildings are situated.

ROTTERDAM, next to Amsterdam in size, is the great seaport of the Netherlands. Its location near the mouth of the Rhine makes it one of the principal ports for the interior of the continent, and explains why it is the European terminus for some of the great steamship lines from America and eastern countries.

BELGIUM

Physiography. — The surface of Belgium forcibly recalls that of Holland. The land is low and flat in the northern and western parts, and gradually rises and grows more rolling toward the south and east.

However, the highest point in Belgium (2230 feet) is more than twice that in the Netherlands. Instead of being caused by glacial moraines and sand dunes, this highland is a mountainous region, formed by upheaval of the earth's crust (Fig. 261). The weathering of ages, which has worn these mountains so low, has revealed valuable mineral deposits, especially coal and iron, which fortunately occur near together, as in England. Lead, zinc, and silver are also obtained.

Belgium, therefore, possesses agricultural advantages similar to those of Holland, while the minerals secure opportunities for manufacturing far superior to those of the Dutch. These facts help to explain why, although Belgium is even smaller than Holland, its population is one-fourth larger, or about 6,500,000. How does that compare with the population of Canada? Indeed, the small country of Belgium is one of the most densely populated regions on

the earth. Figure out the number of inhabitants per square mile and compare it with the number in Ontario, or in your own province.

People and Government. — Like the Dutch, the Belgians have endured untold sufferings in their long struggle for independence. Their country has been, to some extent, a battlefield for the larger countries or *powers* of Europe; for example, the *battle of Waterloo*, by which the career of Napoleon Bonaparte was ended, was fought there in 1815. Since 1830, however, the Belgians have been independent. Their form of government is a limited monarchy.

The intelligence of the Belgians is of the highest order. Even during the Middle Ages their woollen manufactures were the best developed in

FIG. 261.

A view in the hilly section of southern Belgium.

Europe, and at various times the English have induced Belgian artisans to move across to England for the purpose of improving the factory work. Since the great nations of Europe have declared Belgium neutral territory, thus prohibiting further fighting there, the people have found it necessary to keep only a small standing army, and have devoted themselves to the industries. As a result, Belgium has enjoyed a wonderful industrial growth.

Agriculture. — A very small part of Belgium is below sea level; but, as in the Netherlands, much of the country is so flat and fertile that a view on the Belgian plain would closely resemble that in Fig-

ure 258. More than half the inhabitants are engaged in agriculture, the chief products, besides live stock, being grain, flax, hemp, fruit, and sugar beets. Among the farm animals, the Flemish[1] horses are especially noted for their great size and strength.

The Belgian method of farming forms a striking contrast to that in western Canada; for instead of raising from one hundred to several thousand acres, farms in Belgium usually contain not more than two or three acres. To a large extent, spading takes the place of ploughing, and such hand labor, guided by the experience of many generations, secures large yields of the best quality. Flemish flax is the best in the world. In spite of such careful cultivation of the soil much food has to be imported, as in Great Britain.

FIG. 262.
A dog team in Belgium.

Mining and Manufacturing. — Quite distinct from the level northern plain, close set with farms and towns, is the hilly region of the southern angle, covered with forests and rich in minerals. More than one hundred thousand men are engaged in mining, and coal and coke are among the leading exports. Around the northwest slope of the hilly region is located one of the world's busiest industrial regions. As in England, the three important kinds of manufacturing are cotton, wool, and iron and steel. Linen and glass are also made. But the country is so small, and there are so many waterways and railways, — as in the Netherlands, — that coal is transported cheaply to all sections. Manufacturing, therefore, is well distributed, although the coal comes from the south.

Commerce. — By its position Belgium secures many of the advantages that Holland enjoys; that is, it is a gateway to and from the interior of Europe. To be sure, its coast line is only about forty miles in length and the water there is shallow; but ANTWERP has an excellent harbor. There is no large river like the Rhine in

[1] Derived from *Flanders*, a former country of Europe which included a part of the Netherlands, Belgium, and France. Nearly half the Belgians speak the Flemish language.

Holland, but two smaller streams, rising in France, are navigable for some distance. There is also an extensive system of canals. Besides these waterways, Belgium has more miles of railway, for its size, than any other country; and the railways are closely connected with the large trunk lines. For these reasons transportation of goods is one of the leading industries in Belgium.

While the Belgians do not possess such valuable colonies as the Dutch, they have been prominent in African exploration. It was the Belgian king who sent Henry M. Stanley, the great explorer, to Africa, and the King of Belgium is sovereign of the Kongo State.

FIG. 263.

A view in Ghent. Notice the peculiar architecture of the houses.

Cities. — BRUSSELS, the capital and largest city, situated in the heart of the kingdom, is nearly twice the size of Montreal. The name Brussels carpets suggests one of its industries; but carriage and lace making are at present among its most important kinds of manufacture. It is an intellectual as well as a political and commercial centre, having numerous picture galleries, museums, and schools.

ANTWERP, next in size, is situated about sixty miles from the sea, on a small river. Some of the great steamship lines from America have their European terminus there, and the port is one of the most important in Europe. The leading kinds of manufacturing are sugar refining, distilling, lace making, and shipbuilding.

Many other cities are distinguished for manufacturing. The largest are LIEGE, the "Birmingham of Belgium," engaged in the manufacture of firearms, cutlery, glass, and various kinds of machinery; and GHENT (Fig. 263), noted for linen and cotton goods, and for machinery.

Luxemburg, on the southeastern border of Belgium, is a small duchy governed by a hereditary grand duke and a parliament. Like Belgium, by agreement of the powers of Europe it is neutral territory. Agriculture, iron mining, and manufacturing are the principal industries.

REVIEW QUESTIONS. — *The Netherlands.* — (1) Tell about the physiography of Holland. (2) What are the principal mineral products? (3) How does Holland compare with Ontario in size and population? (4) Tell about the people; the government; agriculture. (5) State reasons for reclaiming the land. (6) What about manufacturing? (7) Give three reasons for the extensive development of Dutch commerce. (8) How have the Dutch come to have several important colonies? (9) Name the principal colonies. (10) Tell about the chief cities.

Belgium. — (11) Compare Belgium with Holland as to physiography. (12) Tell about the importance of Belgium; its people and government; its agriculture; its mining and manufacturing. (13) What reasons are there for its important commerce? (14) What about colonies? (15) Locate and tell about each of the cities. (16) What about Luxemburg?

SUGGESTIONS. — *The Netherlands.* — (1) Why are the winds likely to blow with special force and regularity across Holland? (2) Why is this fact of value to the Dutch? (3) What effect must the winds have upon the rank vapors that rise from the damp soil? (4) What do you know about the flower gardens of the Dutch? (5) Have you seen any Dutch pottery, especially Delft wares? (6) Find out about the Peace Conference of 1899 at The Hague. (7) What reasons are there for selecting a small country like Holland for this purpose, and for making treaties between nations which have been at war?

Belgium. — (8) There are greater extremes of temperature in Belgium than in England. Why? (9) Find out some facts about the battle of Waterloo. (10) Give several reasons for spading instead of ploughing land. (11) Examine a piece of lace. From what material is lace manufactured, and how is the work done? (12) Towns in Belgium usually have two names. Why? Would you expect fishing to be as important an industry with the Belgians as with the Dutch? Why?

IV. FRANCE

(For Map Questions, see Map, Fig. 265.)

People and Government. — The early inhabitants of France, called Gauls, were conquered by the Romans, who taught them their language and many of their customs. After the fall of Rome, France was divided into independent kingdoms, which were often at war with one another or with neighboring countries.

The situation of France has, however, tended to bring the kingdoms together; for the country is enclosed on two sides by the sea, and elsewhere, in large part, by mountains. Notice how completely the Pyrenees separate France from Spain; and what a barrier the lofty Alps form along the Italian and Swiss boundaries. Even north of the Alps, a part of the boundary is formed by highlands. While the inhabitants were thus partly protected from invasion, there were few barriers within France itself that kept them apart. It was not difficult, therefore, to bring them under one rule. France has a republican form of government.

Fig. 264.

A valley on the French side of the Pyrenees.

Monaco in the southeast, and *Andorra* in the Pyrenees (p. 319), are the only exceptions. The principality of Monaco, only eight square miles in area, is a noted winter resort because of the fine climate.

Physiography and Climate. — As we have seen, the chief highlands of France are in the south and southeast. Among these highlands the loftiest are the Alps, whose highest peak, Mt. Blanc

FIG. 265.

MAP QUESTIONS: *France.*—(1) France is the nearest country to the British Isles. Estimate the distance. (2) Compare the two countries as to area and population. (3) What waters border France? (4) Compare the coast-line of France with the east coast of England. (5) What countries of Europe border France? How is France separated from these countries? (6) In what respect is the position of France favorable to commerce? (7) What do you observe about the general direction of the rivers? (8) Compare the location of Paris with that of Marseilles.

(15,781 feet), is in France. Had the mountains stretched along the western coast, the history of France would have been very different. As it is, the prevailing westerlies are allowed to distribute their rain somewhat evenly over the country, supplying all sections with an abundance of moisture for agriculture.

The position of the highlands is of great importance for commerce as well as for farming. Fully three-fourths of France is a comparatively level plain sloping westward from the low central plateau, which rises steeply as the western wall of the long Rhone valley. All but one of the large rivers rise in this plateau, and flow gently down its slope to the Atlantic. Thus navigation is possible far into the country. Locate and name the three largest rivers. How does the Rhone differ from the other two?

As might be expected, the summers are warmer than in England, since France lies almost entirely south of that country and is less under the influence of the ocean. The southeastern section, bordering on the Mediterranean Sea, has a semi-tropical climate (Fig. 267), owing to the presence of the warm Mediterranean waters and to the protection from cold north winds afforded by the Alps Mountains.

Agriculture. — France is primarily a farming country, and nearly half the people devote their energies to agriculture, including grazing. The same grains are raised as in England. What are they? Wheat is the most important, and more of this grain is produced than in any other European country excepting Russia. Yet France does not raise nearly enough wheat for the needs of her people, and is compelled to import both wheat and flour. Grapes, not important in the British Isles, thrive in the warmer climate of central and southern France.

Grapes form the most valuable of all French crops, and more are raised in France than in any other country of the world. This fruit, although capable of enduring severe cold, requires a warm summer. The distribution of the vineyards, therefore, shows forcibly the difference between the climates of England and France. Grapes do not mature well in northern France, but they flourish in the warm valleys from the Loire southward.

As in other countries, the highlands, as a rule, are capable of little cultivation and are usually given over to grazing. Give examples from other countries. As in England, too, there are broad tracts of lowland which are better adapted to the production of

FIG. 265 A.

To show Paris and surrounding country. Notice how closely the railways follow the stream valleys. Why should they?

grass than to other crops. These facts explain why there are more than thirteen million cattle and twenty-one million sheep in France. What does that signify in regard to manufacturing?

Minerals. — France is quite inferior to the British Isles in its mineral products. Coal is the most valuable mineral; but while Great Britain, after supplying her many factories, exports a large amount of coal, France has to import some. The principal coal beds, from which more than half the output comes, lie close to Belgium. They are, in fact, a continuation of the deposits that were found to be so plentiful in that country. The other beds are small and scattered, but the best of them lie near the centre of the country, not far from ST. ETIENNE. Of what advantage is this location?

FIG. 266.

A view in central southern France (Monts d'Auvergne on the map). This is a region of extinct volcanoes, and the church is built upon a steep lava hill.

FIG. 267.

A street scene in Nice (near Monaco), showing the nature of the vegetation in that warm climate.

The quantity of iron produced is small and comes mainly from the northeast, near the coal fields. Fine clays for porcelain abound in central France, and building stones are quarried in nearly every part.

Manufacturing. — In spite of the limited supply of fuel, France is a great manufacturing nation. Besides silk and wine, in the production of which that country is the leading nation of the world, there is extensive manufacturing of metal, cotton, and woollen goods. One reason for these manufactures is the fact that coal is easily obtained, either in France or from the neighboring countries of Belgium, Germany, and England. Another reason has to do with the nature of the people themselves.

Fig. 268.

A farm scene in southern central France. The mountain peak is an extinct volcano, one of the Monts d'Auvergne (Figs. 337 and 339).

The Frenchman has a peculiar appreciation of what is graceful, delicate, and elegant. This is illustrated by the fact that our fashions in dress originate in France; and a skirt, a pair of gloves, or a bonnet from Paris is expected to be a trifle more desirable than one bought elsewhere. The French have accordingly specialized in this direction; and thus their artistic sense has had great influence upon both the kind and amount of their manufacturing.

Fig. 269.

A village in southern France.

Wool and Cotton Manufactures. — The northern part of France, including LILLE, ROUBAIX, and REIMS, as well as cities near the mouth of the Seine, is the section especially noted for the woollen industry. Here coal is most easily obtained; and large numbers of sheep are raised on the hills and plains near by. Besides this, foreign wool from Argentina

and Australia is easily imported at HAVRE and at the Belgian port of Antwerp. Remembering that the goods turned out — as hosiery, carpets, and underclothing — are of high grade, and such as wealthy people wish, we see that this location, between the two wealthiest capitals of the world, is especially advantageous. Woollen cloths are, next to silk goods, the most important French export to Great Britain.

Cotton manufacturing — mainly for the home market, as indicated above — is also extensively developed near the coal fields of northern France. An important reason for such work at this point is the ease with which cotton may be imported from America; and this explains why ROUEN on the Seine is a prominent centre for cotton goods. There are also cotton factories in eastern France, where water power is used instead of steam power. Why should there be water power in that section?

Silk Manufacturing. — Because the climate and soil of the Rhone valley are adapted to the mulberry tree, and because coal mines are near by, this section is a great silk manufacturing region. LYON is the centre, and ST. ETIENNE and PARIS are noted for this industry.

The traveller in the Rhone valley sees grove after grove of mulberry trees, carefully cared for in order to supply an abundance of leaves for the silk-worm to eat in summer.

The silk-worm moth, at the end of the caterpillar stage, weaves a cocoon about itself. The material of which the cocoon is composed is a thread, about two miles in length, which must be very carefully unwound. The single strand is such extremely fine silk that, in order to make a fibre strong enough for spinning and weaving, it is united with several others.

Since the worms are reared under cover, the silk industry may be carried on in any climate well adapted to the mulberry tree. It is possible, therefore, to make raw silk in many parts of the world; but the feeding of the worms and the transformation of the cocoons into silk for the market require much labor, care, and skill. On that account silk production is chiefly confined to those parts of the world where laborers will accept low wages, and where, owing to generations of such work, habits of watchfulness and care have been developed. China accordingly produces the greatest amount of raw silk; but France, in the midst of the civilized world, where the market for silk goods is greatest, also produces a large quantity and is the leading country for the manufacture of silk. Make as long a list of silk goods as you can.

Other Manufactures. — The extensive cultivation of grapes has been mentioned. Much of the wine made from them is consumed

at home, for in France even the day laborer drinks wine at his meals in place of or mixed with water. An enormous amount of wine is also shipped abroad. The manufacture of steel goods is important in some places, but to no such extent as in Great Britain. Other kinds of manufacturing are mentioned under the cities.

Paris. — Paris, the capital of France, is the largest city on the continent of Europe and the third largest in the world. It numbers more than 2,500,000 inhabitants.

Location. — There is a definite reason for the exact site of Paris; for an island in the Seine at that point made the river easier

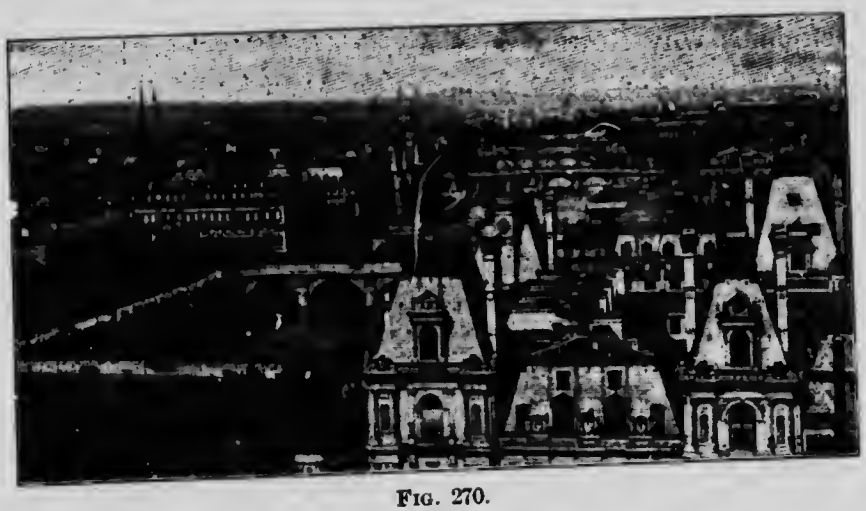


FIG. 270.

A view looking over Paris, with the Seine in the centre of the picture.

to bridge over, while at the same time it aided in defence. Aside from that, the Seine, having a slower current than the Rhone, and being less subject to overflows than the Loire, is more easily navigable than any other river in France. Its upper tributaries bring it into close touch with eastern France; and, by the aid of canals, there is water connection with the Loire and Saone, and with the Rhine in Germany. Furthermore, Paris is situated on the main trade route from the Mediterranean to northern and central France, which follows the Rhone, the Saone, and the Seine. In addition, Paris is located in the midst of the most fertile portion of the country, and not very far from several other densely populated countries. For these several reasons it has always been the principal French city.

Paris as an Art Centre. — Reference has already been made to the appreciation of grace and elegance characteristic of the French

people. Napoleon and other rulers collected art treasures from various nations, and founded collections and schools which have made Paris famous. The superiority of this city in that respect is recognized generally by the large number of men and women who go there every year for the study of art. It is not strange, therefore, that Paris should be distinguished the world over for its beauty as a city. The wide streets, the beautiful parks with their fountains and statues, and the fine public buildings and old royal palaces, are wonderfully attractive. Even the dwelling houses are in harmony, for it is required by law that new buildings must harmonize with those near by. Therefore one seldom sees an unattractive house in Paris.

One of the old palaces, known as *the Louvre*, is the most noted art gallery in the world. It contains thousands of works of art, the most celebrated of all being the Venus of Milo. Among the paintings, one of the most famous is Raphael's Madonna and Child with St. John, copies of which are often seen in Canada.

Among the many interesting suburbs of Paris is VERSAILLES, where there is another palace that was erected in the days of royalty. It is now

FIG. 271.

Fontainebleau, a beautiful wooded park south of Paris.

mainly used as a museum, and scores of the large rooms are decorated with the finest of paintings. It is among such treasures that the students of art spend much of their time; and it is partly because of the beautiful surroundings that many foreigners reside permanently in Paris.

Manufactures of Paris. — Like other great cities, Paris has too many industries to be specially identified with any particular one. Yet the superior taste of the Parisians has led them to pay especial attention to the manufacture of articles which combine utility with beauty, such as jewellery, furniture, gloves, fashionable shoes, etc. The Sèvres porcelain is made in the suburbs of Paris, and both this and the Limoges ware, manufactured at Limoges, are celebrated for their beauty.

Commerce of Paris. — Although so far inland, Paris ships more goods by water than any other French city. The extensive canal connections of the city have already been mentioned. Vast sums have been spent in dredging the lower Seine, so that the depth of water between Rouen and Paris now exceeds ten feet. Small vessels can proceed directly to Paris, but larger ships transfer their goods at HAVRE and ROUEN. Besides this, the chief railways of France radiate in all directions from Paris. All together, therefore, Paris is the political, artistic, manufacturing, and commercial centre of France.

Other Cities. — HAVRE, which is almost as busy a harbor as MARSEILLE, has an extensive trade in coffee from Brazil, and in wheat and other materials from America. Another important port is BORDEAUX, on the Garonne River, in the midst of a fertile grape-raising district. It is the chief port for the export of French wines. Locate the cities previously named and tell for what each is important. Note especially LYON, next to Paris in size, and nearly three times as large as Toronto.

The third French city in size, and its leading seaport, is MARSEILLE, which is almost as large as Lyon. The delta of the Rhone is too marshy for a city, and Marseille occupies the nearest point where there is a good harbor and where other conditions are favorable for a town. For many centuries the Rhone valley was the principal gateway from the Mediterranean to much of Europe. One route leads to the Seine valley, and thence to Paris, northern France, and Belgium. Another enters Switzerland through Lake Geneva, out of which the Rhone flows; and still a third route leads, through an opening in the mountains, into the Rhine valley and Germany.

Commerce of France. — Notwithstanding the great amount of internal commerce on the numerous rivers, canals, and railways, and notwithstanding the extensive foreign trade, France is not a great maritime nation like the United Kingdom. In fact, her merchant marine is only one-tenth as large as that of the British Isles and three-fifths that of Norway. This is not entirely because of lack of acquaintance with the sea, for there are more French than British fishermen. The small number of good harbors, and the frequent and destructive wars during the last century, are among the reasons why France depends so largely upon other nations, as upon British and Norwegians, for vessels to carry her goods. Why is it safer for her to be thus dependent than for Great Britain?

Colonies. — On the other hand, France has been extensively engaged in exploration. You will remember that the French formerly had extensive possessions in North America. Where were they? Where are her present possessions in the New World?

In Asia, France holds a part of Indo-China and a very small bit of India; and she has numerous islands in different portions of the world. But her most important colonies are in Africa, as follows: (1) Algeria and Tunis, across the Mediterranean; (2) a vast area south of these countries, including a large part of the Sahara Desert, the Sudan, the upper Niger, and the country north of the Kongo River; and (3) the large island of Madagascar, east of southern Africa.

REVIEW QUESTIONS. — (1) Tell about the early inhabitants; (2) the influence of the boundary line for unity; (3) the government; (4) the physiography and climate. (5) What are the principal farm products? (6) Which of these have been found in Great Britain? (7) Which have not been found there? Why? (8) Tell about the mineral products. (9) Give reasons for the extensive manufacturing. (10) Tell about the woollen manufactures. (11) Cotton manufactures. (12) Tell about silk and silk manufacturing. (13) What about other manufactures? (14) Tell about Paris; its size; location; artistic attractions; manufactures; commerce. (15) Tell about: (*a*) Havre, (*b*) Bordeaux, (*c*) Lyon. (16) What are the reasons for the location of Marseille? For what is it important? (17) What is there peculiar about the commerce of France? (18) Tell about the colonies.

SUGGESTIONS. — (1) What is the name of the present President of France? (2) Give reasons why one river, as the Loire, might be much more subject to overflows than another, as the Seine. (3) Examine Figure 232 to see if the glacier reached into any part of France during the Glacial Period. (4) Raise a silk-worm from the egg. (5) Examine a cocoon and see if you can unravel some of its thread. (6) Also unravel a piece of silk goods and examine the threads. (7) What influence on the commerce of Marseille has the construction of railway tunnels through the Alps probably had? (8) The construction of the Suez Canal? Why? (9) See if you can find any porcelain ware from Sèvres or Limoges. (10) What changes might be brought about in your locality if the people there prided themselves greatly on the beauty of the streets, houses, etc., as the Parisians do? (11) What pictures of fine statuary have you seen? (12) Find the names of some of the great French painters. (13) Read some stories from French history; for example, the story of Roland in the days of Charlemagne, when the Pyrenees helped the French to keep the Saracens back; the story of the French Revolution; the story of Joan of Arc, etc. (14) Make an outline sketch map of France, with the principal mountains, rivers, and cities. (15) On an outline map of the world, sketch in the French colonies with their names.

V. SPAIN AND PORTUGAL

Map Questions (Fig. 265). — (1) What other cities in the world are in about the same latitude as Madrid? (2) Compare the area of the Spanish peninsula with that of France. (3) Compare the populations. (4) Compare the directions taken by the rivers. (5) Judging from the map, what would you expect as to the number of good harbors? (6) What has been stated in an earlier chapter about the temperature and rainfall in Spain? (7) What islands in the Mediterranean Sea belong to Spain?

People and Government. — The people of this peninsula once had much the same rank among nations as is now held by the British.

Fig. 272.

The Alhambra, one of the last strongholds of the Moors, — Mohammedans who once conquered and occupied Spain.

Name countries that they controlled. Mention some noted Spanish and Portuguese explorers. Now, however, both Spain and Portugal are classed among the weaker nations of Europe.

The mountainous character of the peninsula has been one important cause of the decline of Spain and Portugal. The various races on the peninsula, cut off from one another by tablelands and mountain ranges, have never been fairly blended into one people. For centuries they were divided into small, independent kingdoms having different languages. Just before the discovery of America, however, most of these states were brought under one rule by the marriage of Ferdinand and Isabella; and later even Portugal was joined to Spain.

But Portugal, which is partly separated from Spain by deep gorges and canyons, soon broke away. Also *Andorra*, a small country in the Pyrenees, was never fully conquered and is still independent; and the union of some of the others has been by force rather than by choice. At present the parts of Spain are held together under a limited monarchy, and the same is true of Portugal.

Physiography and Climate. — The key to many important facts about Spain and Portugal is found in the extensive elevation of the land. On the northern boundary stand the Pyrenees, continued on the west by the Cantabrian Mountains, while in the extreme south are the lofty Sierra Nevada ranges. Between these two systems is a broad plateau, from two to three thousand feet in elevation, with numerous short, broken mountain ranges.

In the Ebro valley on the northeast and the Guadalquivir (meaning Great River) valley on the southwest there are lowlands. Point to these rivers on the map. The only other extensive lowland is a narrow strip near the sea, which reaches most of the distance around the peninsula. A very large proportion of the surface, therefore, is made up of plateaus and mountains.

This elevated surface has been instrumental, in the first place, in preventing Spain from becoming a great thoroughfare for the transportation of goods. The position of the peninsula, between the two busiest seas of the world, and between Africa and central Europe, suggests that it might be a valuable route for commerce. But the highlands *separate*, rather than unite, these regions.

The highlands have an important influence also on the climate. Owing to the elevation the interior has cold winters, though the summers are hot; and because of the fringe of mountains, the rainfall is light everywhere except near the northwestern coast, where the vapor is condensed in rising over the slopes (Fig. 235). The southern portion of Spain, like northern Mexico, being in the horse latitudes (p. 22), is so arid that agriculture without irrigation is impossible.

There are several other effects produced by the highlands. In the first place, the rivers are unnavigable; for in descending from the arid plateau to the coastal plains their courses are rapid and their volume slight. Besides that, most of them have cut such deep, narrow valleys, like that of the Colorado Canyon, that they are not only useless for irrigation but are even a great hindrance to communication. The Guadalquivir, which has

a wide valley and which vessels are able to ascend as far as SEVILLE, is the principal exception.

Since the interior is so arid and rugged, it must have little timber, little agriculture, few people, and few roads, railways, and canals. With one or two exceptions, therefore, the chief towns are to be found along the coast.

Agriculture and Grazing. — In one respect the elevation of the land is an advantage, because it insures great variety of climate and hence many kinds of farm products. What countries of South America does this condition call to mind?

We may expect grazing in the uplands and among the mountains, as in similar rugged and arid regions elsewhere. Name some of them. Spain is noted for the excellent grade of its sheep and mules. There are also many cattle, especially in the rainy northwest; but the fact that so much of the country is arid explains why there are many more sheep and goats than cattle. The sheep often wander about in flocks of ten thousand under the care of a number of shepherds and their dogs. In summer they feed among the mountains, but in winter they are driven down to the more protected lowlands for shelter.

FIG. 273.

A sheep pasture at the Convent of Palos in Spain.

Wheat is the most common crop in Spain, since it requires comparatively little rain; but there is far less than might be, since so many of the Spaniards lack energy and enterprise.

In many of the valleys where irrigation is possible, and especially on the lowlands along the coast, the farmers are more progressive and prosperous. Barley, rye, and corn are raised in addition to wheat, and these are among the staple foods of the people. Quantities of grapes are also grown in Spain and Portugal; and in the southern part of the peninsula the bark of the cork oak is a source of income to both countries.

The arid southeastern coast is wonderfully productive. One reason is the warm climate, due to the influence of the Mediterranean; another is the number of mountain streams, which, though useless for navigation, are extremely valuable for irrigation. Some of the products of this section, besides wheat and corn, are cotton, grapes, olives, figs, dates, oranges, lemons, and rice. Several crops of some products may be raised in a year.

Mining. — Spain is remarkably rich in minerals. Lead and silver are mined in the upper valley of the Guadalquivir, and along the southeastern coast. Some distance north of SEVILLE a large quantity of *quicksilver*, or mercury, is obtained; and northwest of Seville, and in southern Portugal, are some noted copper mines. Coal and iron ore are found in several parts of the peninsula, but the largest output of each occurs on the northern slope of the Cantabrian Mountains. Spain produces more quicksilver than any other country, and is second among the countries of the world in the output of copper and lead.

FIG. 274.

A wooden-wheeled ox cart, to illustrate the backwardness of the Spaniards.

Here, however, as in other industries, the character of the people prevents proper development of the resources. Much of the benefit from the mines is due to the capital and enterprise of foreigners; the English and French are in control of the copper mines, and the Rothschilds, the great European bankers, own the quicksilver.

Manufacturing. — From what has been said above, it is apparent that manufacturing cannot flourish. This fact is all the more evident when we consider that more than two-thirds of the Spaniards, and three-fourths of the Portuguese, cannot read. Thus, although they have coal beds, much of their iron ore, instead of being smelted at home, is shipped to the coal fields of Swansea in Wales to be smelted. In some places, however, as will be seen in our study of the cities, there is manufacturing of certain kinds.

Principal Cities of Spain. — MADRID, the metropolis and capital of Spain, is nearly as large as Manchester; but unlike most other large cities so far studied, it is not an important manufacturing centre. Why not? The explanation of its size is found in its central location, and the fact that it is the seat of government. In crossing the peninsula to connect the coastal cities, all the principal railway lines

converge at this point, and thus Madrid has become the intellectual and political centre of the country.

To some extent, Madrid, with its wide streets, magnificent royal palace, and one of the finest art galleries in the world, recalls the attractions of Paris. But one of its most frequented places is an enormous building, which seats many thousands and which is used for bull fighting. In its indulgence in this brutal sport the city bears no resemblance to Paris; nor is there any resemblance in its surroundings. From the streets of Madrid one looks across the country for miles and miles, seeing not a tree nor fence nor house; only the weeds and scattered vegetation of an arid waste.

FIG. 275.
A Spanish bull fight.

The city next in importance upon the highlands of Spain is GRANADA, the last stronghold of the Moors. To this point among the mountains, at the intersection of the best routes of travel from east to west, and from north to south, these people withdrew. Here they maintained themselves for two hundred years and developed a city of four hundred thousand population. At present, Granada contains less than one-fourth as many inhabitants, and its principal attraction is the Moorish palace, or Alhambra (Fig. 272), one of the finest examples of Moorish architecture in existence.

On the lowlands west of Granada are SEVILLE and CADIZ, both flourishing cities at the time when vast stores of plunder were being brought from the Spanish colonies in the New World. CADIZ is now a fortified naval harbor; and SEVILLE is recovering a degree of her former commercial importance. One tobacco factory in Seville employs about five thousand women in making cigars and cigarettes.

Gibraltar, a steep hill, with bold cliffs rising on nearly all sides, and with a town at its base, has belonged to Britain since 1704. This rock hill (Fig. 276) is, perhaps, the strongest fortification in the world, and guards the entrance to the Mediterranean. Why is this stronghold of special importance to Great Britain?

Malaga grapes serve to remind us of the coastal city by that name, and of the products about it. It has one of the warmest climates in Europe.

FIG. 276.

The rock of Gibraltar from the Spanish coast, showing the narrow neck of land which connects it with the mainland.

VALENCIA and BARCELONA are the leading seaports of Spain. The region about the former is a beautiful garden, much like southern California, which it resembles also in products. Name some of the products. In addition, rice is grown on the lowlands near the coast. BARCELONA, the second Spanish city in size, is the principal seaport and an important textile manufacturing centre as well.

On the whole Spain is poorly provided with harbors; and while the majority of the people dwell near the coast, and many engage in fishing, they take a small share in international commerce.

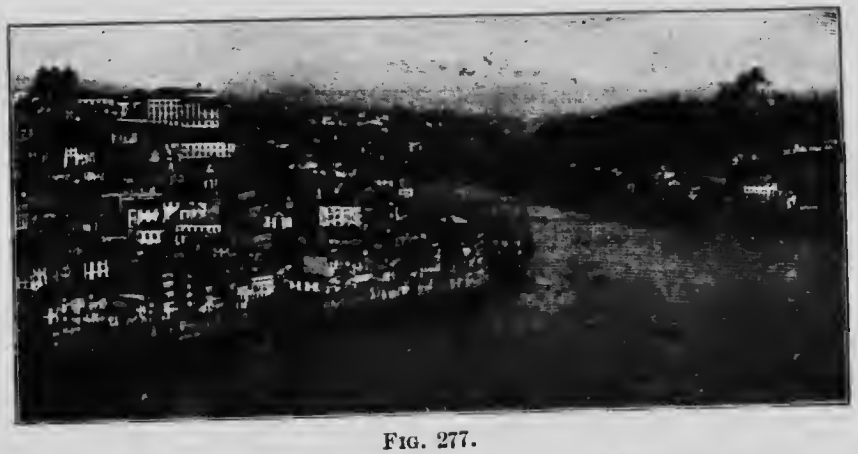


FIG. 277.

The harbor and city of Oporto. Describe the situation of the city.

Colonies of Spain. — The only remnants now left to Spain of her once magnificent foreign possessions are for the most part in Africa. These

include a few small settlements on the coast of Morocco; a portion of the western coast of Sahara, having little value; and a few small islands in the Gulf of Guinea. The Canary Islands, west of the northern coast of Africa, and the Balearic Isles in the Mediterranean also belong to Spain.

Principal Cities and Colonies of Portugal. — LISBON and OPORTO are the chief cities of Portugal. The former, the capital and metropolis, lying on a broad bay where the Tagus River enters the sea, has one of the finest harbors in existence. With its white houses, its cathedrals and palaces — all partly buried in trees on the hillsides surrounding the harbor — it vies in beauty with the most attractive cities in the world.

The misfortunes of Lisbon have been many. It has suffered from sieges, plagues, and earthquakes. The most terrible catastrophe happened in 1755, when an earthquake, followed by fire, destroyed most of the houses and a large part of the population.

OPORTO gives the name to Port wine. The lower part of the Douro valley is one of the richest wine districts in Europe, and Oporto, like Bordeaux, is an important point for its export.

Portugal, like Spain, has lost much of her foreign territory. The Azores Islands, far to the west in the Atlantic, and the Madeira Islands, to the southwest, are a part of the kingdom. The Cape Verde Islands, a volcanic group off the coast of Africa, are dependencies. Portugal also has large possessions on the mainland of Africa and smaller ones in Asia.

REVIEW QUESTIONS. — (1) Tell about the people and government of Spain and Portugal. (2) Describe the highlands of the peninsula. (3) Mention several consequences of this elevated condition of the land. (4) Tell about agriculture and grazing. (5) Tell about the mining. (6) What can you say about manufacturing? (7) Give the main facts about the following cities: (*a*) Madrid, (*b*) Granada, (*c*) Seville, (*d*) Cadiz, (*e*) Malaga, (*f*) Valencia, (*g*) Barcelona. (8) For what is Gibraltar noted? (9) What about the colonies of Spain? (10) Tell about (*a*) Lisbon, (*b*) Oporto. (11) What about the colonies of Portugal? (12) Name and locate the principal cities of Spain and Portugal.

SUGGESTIONS. — (1) About what portion of the boundary line between Spain and Portugal is formed by rivers? (2) What must be the influence of railways upon the old-fashioned methods of farming in the interior? (3) Recall the Spaniards' treatment of the Incas in South America. (4) Learn what is meant by the Pillars of Hercules. (5) Find other pictures of Moorish architecture. (6) Read Washington Irving's "The Alhambra." (7) Make a sketch of the Spanish peninsula, including the principal rivers and cities.

VI. NORWAY, SWEDEN, AND DENMARK

(For Map Questions, see Map, Fig. 236.)

People. — The people of these three countries have long been more or less united, for the well-settled southern portions of Norway and Sweden are not separated by any natural barrier, while only a narrow, shallow sea separates Scandinavia from Denmark. Being descended from a common stock, and at times having a single government, they have many interests in common. The written language of the Norwegians and Danes is still the same, and Norway and Sweden were until 1905 united under one king, although they had separate local government. Denmark is now independent, as it has always been, and, like Norway and Sweden, is a limited monarchy. Norway and Sweden were once a part of Denmark.

These people have been closely connected with our own history, for they made some of the early invasions and settlements in Great Britain. Their daring seamen reached Greenland, by way of Iceland, and discovered America nearly five hundred years before Columbus approached its shores. For many years past settlers by thousands from Norway, Sweden, Denmark, and Iceland have been coming to Canada. No immigrants are more welcome than those from these northern countries.

Physiography and Climate. — There are only about one-fourth as many inhabitants in these three countries together as there are in the British Isles; yet in spite of frequent European wars, they have preserved their independence through many centuries. This has been due in part to their peculiar position. The only land approach to Scandinavia is by way of Lapland in Russia, which is so far north that it is very cold. Thus the peninsula is almost as isolated from other nations as is Great Britain.

Denmark, on the other hand, is partly connected with Germany. However, the most important parts of Denmark, the islands, are completely separated by water. These islands and the Danish peninsula (Fig. 293) are the higher portions of a lowland that were left projecting above the water when sinking of the land changed

the Baltic valley to a somewhat shallow sea. Standing at the entrance to the Baltic, they guard the approaches to this inland sea, and naturally Germany, Russia, and other nations have long coveted them. But as neither of the Great Powers was willing that one of the others should hold them, little Denmark has been allowed to continue its independent existence.

Fig. 278.
A Norwegian fjord with steep cliffs rising from the very water's edge.

The rugged surface and severe climate of Scandinavia have also served as a protection against invaders. From its southern to its northern end the peninsula is mountainous. It is an ancient mountain land, much worn, and cut by deep stream valleys. While some peaks reach an elevation of six to eight thousand feet, most of them are lower and of so nearly the same height that the upland resembles a plateau when viewed across the mountain crests. The boundary between Norway and Sweden follows the divide between the east and west flowing streams; and since the mountains descend steeply into the ocean on the western side, those streams which flow toward the west are the shorter. Therefore, in all but the southern part, Norway is a narrow, mountainous region crossed by short streams flowing in deep, steep-sided valleys (Fig. 278).

Agricultural Districts. — The mountainous surface and cold climate are unfavorable to agriculture, although the warm ocean waters exert an enormous influence here, as in the British Isles. In rising over the mountains, the westerly winds supply abundant rain and snow, and it is the latter that causes the numerous glaciers.

Since the slope on the eastern side is much the longer, Sweden has extensive lowlands throughout its length. But these lowlands are so far north, and so protected from the influence of the sea, that in all but the southern part agriculture is of little importance.

Although Denmark is free from mountains, the northern and western portion of the Danish peninsula (called Jutland) is a sandy waste, so that only the islands and the southeastern part of the peninsula are very productive.

In these three countries, therefore, there is a comparatively small area that is valuable for agriculture, and the sections lie near together; namely, in southern Norway and Sweden and in eastern Denmark.

Industries and Cities of Norway. — Since less than four thousand (out of a total of one hundred and twenty-five thousand) square miles in Norway have a soil and climate adapted to agriculture or pasturage the amount of stock and grain produced is small. Therefore, much meat, flour, and other food must be imported.

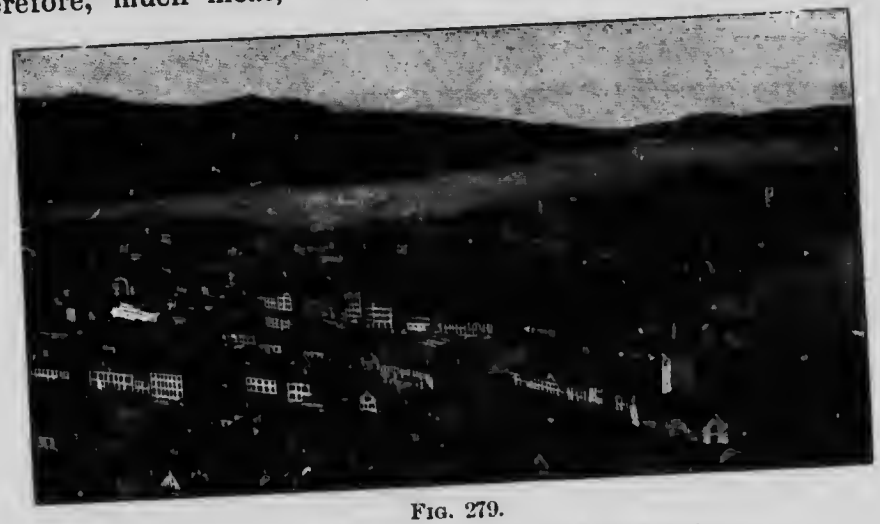


FIG. 279.

Bergen, Norway, with its deep, narrow fjord harbor.

Also, while there are some silver and copper mines, coal is entirely lacking, because the rocks were formed before the Coal Period. Manufacturing, therefore, is little developed. Even the fine water power is little used, because raw products for manufacturing are not abundant.

On what, then, do the two million inhabitants depend for a living? They have two valuable resources, — lumber and fish. More than one-fifth of the country is forest-covered — pines being most common, — and lumber, wooden goods, and paper are the most important exports. As in Quebec, the rapidly flowing rivers are of use in moving the logs from the forest, and also in supplying power for the sawmills and planing mills.

Fish abound on the shallow banks along the irregular western coast, especially codfish in the neighborhood of the far northern Lofoden Islands. The North Sea with its many fish is also close at hand, and the Arctic Ocean with its seals and whales. Over a hundred thousand Norwegians are engaged in the fishing industry. Along the fjords every family owns a boat, and knows how to make as well as use one. While the men are at sea the women work the small farms or garden patches.

The abundance of lumber and the love for the sea, developed through centuries of experience in navigating the deep fjords and in fishing, have given rise to a third great industry, that of carrying goods for other nations. The timber for wooden vessels is easily

Fig. 280.

North Cape, the northern point in Norway. The summer sun is shining here at midnight, because the cape is within the Arctic Circle.

supplied, and this small Norwegian nation has at present a greater *number* of freight vessels than any other European country except the British Isles.

These facts help to explain why the Norwegian towns are found along the coast. Indeed it is rare to find even a village in the interior. The two principal cities are CHRISTIANIA, the capital and largest city, and BERGEN (Fig. 279). The former is situated at the head of a long, narrow, sunken valley, or fjord, which makes an excellent harbor, and the city is the principal port and distributing centre for southern Norway. Bergen is the important fishing port, as Aberdeen is in Scotland.

Scenery on the Western Coast. — As in the British Isles and northeastern North America, the sinking of the Scandinavian peninsula has caused the sea to enter the river valleys, forming many bays, peninsulas, and islands. It is estimated that there are fully ten thousand islands along the coast of Norway. Owing to the fact that, before the sinking took place, the river valleys were deeply cut in hard rock, the bays are usually long, narrow, and deep fjords (Fig. 278).

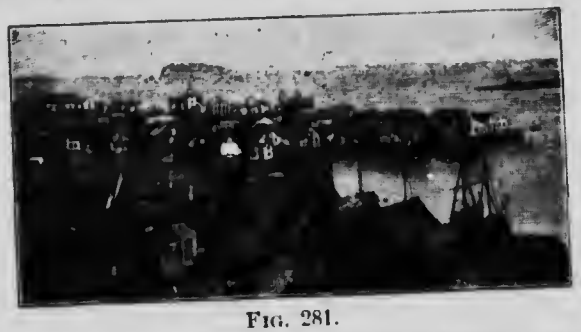


Fig. 281.

Hammerfest, Norway, far within the Arctic Circle. This town is the nearest to the pole of any in the world excepting Upernivik in Greenland, where all but a few of the inhabitants are Eskimos.

Some of the fjords extend fully ninety miles inland, and swollen streams from the mountains frequently plunge, for a fall of a thousand feet or more, over the vertical cliffs which bound the fjords. The cliffs are often only barren rock; but here and there, where the slopes are not too steep, green forests cover the surface; glaciers are frequently in sight; and occasionally, upon a level patch, a hamlet of fishermen's homes (Fig. 234) is seen. These hamlets are usually upon the deltas of small streams and are connected with the outer world, and with other villages, by no road or pathway except the waters of the fjord. So isolated are these hamlets that each man must learn to do many things, — farm, fish, tan his leather, make his shoes, build his boat, his house, etc.

Hundreds of visitors from all parts of the world travel by steamer along this coast every summer to enjoy the beautiful scenery. Another attraction is the sight of the sun at midnight (Fig. 280). At Bergen, Christiania, and Stockholm, which are in nearly the same latitude, the shortest night is less than six hours; at Trondhjem it is about four; and at Hammerfest (Fig. 281), far within the Arctic Circle and near North Cape (Fig. 280), the sun does not set from May 13 to July 29.

Industries and Cities of Sweden. — Agriculture is the leading industry of Sweden, for fertile soil, swept by the glacier from the northern and western highlands, has been scattered over the lower lands. In consequence, the southern part of the country presents much the same appearance as parts of Ontario. Oats are raised in most abundance, but rye, barley, wheat, and potatoes are also produced. One reason why these products can mature here is the absence of cool summer winds from the ocean; another is the great length of the summer days in this far northern latitude. Much live stock is also raised, and butter is exported to Great Britain.

However, nearly one-half the area of Sweden is covered with

forest, and lumber is by far the greatest article of export, as in Norway. Indeed, these two countries supply much of the lumber needed in western Europe. Their wood is especially valued because of its hardness and durability — qualities that are due to the closeness of the annual rings caused by the shortness of the summer season.

Mining is the third important industry. There are silver, lead, zinc, and copper mines. Some coal is found in the southern end, and the country has long been noted for its excellent iron ore. But since the principal iron mines are located far from the coal, there is little iron manufacturing in Sweden. However, as in other parts of the world, some of the iron ore is smelted by the use of charcoal, and

FIG. 282.
The royal palace at Stockholm.

some by coal mined in Sweden or brought from other countries. The Swedish iron is of such excellent quality that it is eagerly sought where the highest grade of steel tools is manufactured, as in Sheffield, England.

Sweden possesses excellent water power for various kinds of manufacturing, and in recent years the numerous rivers have begun to be utilized, so that manufacturing is making rapid progress there.

The two principal cities — STOCKHOLM, the capital, and GOTHENBURG — are on the coast; but there are other small seaports and inland mining towns. Stockholm is the residence of the king of Sweden. The royal palace is one of the most beautiful buildings in the country (Fig. 282). The situation of this city is one of marvellous beauty, on an excellent harbor; but unfortunately it is blocked with ice for four months each year. Owing to the numerous lakes and to canals,

it is connected by water, as well as by rail, with the chief points in a populous region, and is therefore the principal distributing centre for imports. Gothenburg, the chief centre for exports, possesses the important advantage that its harbor is seldom frozen over. It is connected with Stockholm by railway as well as by lake and canal. Much of the distance between these two cities is occupied by lakes.

The principal foreign trade of both Norway and Sweden is with Great Britain. Give reasons for this. What must be the main articles of import and export? Next to Great Britain comes Germany. Can you suggest reasons for this?

Industries and Cities of Denmark. — There is neither coal nor metal in the rocks of Denmark, so that there is no mining in the country. The only mineral product of value is clay, well suited to the manufacture of porcelain, which is an important industry. As in Ireland, the lack of coal for fuel is partially met by peat from the bogs and swamps of the northern and western parts.

The fact that butter constitutes one-half the exports of Denmark throws much light upon the principal occupation of the people. Farming, especially dairying, is the chief industry; and in this small country there are a million and a half dairy cows and nearly as many sheep, besides many horses, goats, and pigs. The laws of the nation discourage large farms, so that each farmer, by carefully cultivating a small patch of land, as in Belgium, obtains the most that it can yield.

FIG. 283.
A view in Copenhagen.

The nearness to good fishing banks has naturally made fishing important; and this, together with the influence of island life, has created such a love for the sea that large numbers of Danes serve as sailors on British and other foreign vessels.

As in the case of Norway and Sweden, the principal foreign trade of Denmark is with Great Britain. Why? What goods may well be exchanged? One might therefore expect an important seaport on the western coast; but that coast is so low, and so shut in by

sand bars, that good harbors are lacking. In fact, the only harbor in all Denmark that admits large vessels is COPENHAGEN (merchants' harbor) on Seeland Island. Since this point guards the entrance to the Baltic Sea, there is a double reason why Copenhagen is the principal city of Denmark. The fact that it is the capital also increases its importance.

Colonies of Denmark. — The Danes, even more than the Norwegians, have been daring seamen and explorers of foreign lands. Although some of their possessions have been lost, Greenland and the Faroe Islands are still Danish colonies, and Iceland is a Danish dependency. In the *Faroes*, consisting of a score of small islands north of Scotland, the principal products are sheep and fish. Why might you expect these two particularly?

Iceland, which is larger than Ireland, and more than twice the size of Denmark, is an island of volcanic origin. Over a hundred volcanoes are found there, twenty-five of which have been in eruption during historic times. Mt. Hecla is one of the most noted of these. Destructive earthquakes are common, and there are also geysers similar to those found in the Yellowstone National Park. The interior is a desert plateau, for the most part covered with snow, and hence uninhabited. Near the sea, however, there is some good pasture land, and the people are principally engaged in raising cattle and sheep. Fishing is important, and down from the eider duck is a valuable product.

REVIEW QUESTIONS. — (1) What about the people of these three countries? (2) Describe briefly the surface of Norway; of Sweden; of Denmark. (3) Where are the principal farming sections? (4) Tell about agriculture in Norway. (5) Why is there little manufacturing there? (6) What is the principal export? Why? (7) What about fishing? (8) Give reasons for the large merchant fleet of Norway. (9) Tell about the cities of Norway. (10) Describe the scenery on the western coast. (11) Tell about Sweden: principal industry; forests, mining; manufacturing; principal cities. (12) What are the industries in Denmark? (13) Tell about Copenhagen. (14) Tell about the foreign territory of Denmark. (15) What are the important facts about Iceland? (16) Give reasons why Norway, Sweden, and Denmark have their principal foreign trade with the British Isles.

SUGGESTIONS. — (1) Why should the telephone prove of special importance among the fishing towns scattered along the coast of Norway? (2) By use of a globe explain why the sun does not set for weeks at a time at Hammerfest. (3) Why is the whale and seal fishing important as a means of furnishing light during the long night of this northern land? (4) What do you know about the life of the Laplanders? (5) Why should Bergen be one of the rainiest cities of Europe? (6) Give reasons why harbors on the Baltic should be blocked by ice much oftener than those on the western coast of Norway. (7) Can you give a reason why so many matches should be made in Sweden? (8) Give all the reasons you can to explain why the Norsemen should have become such daring navigators. (9) Hans Christian Andersen was a native of Denmark. What stories do you know that were written by him? (10) Read and retell stories of the Norse gods in old-time mythology.

VII. RUSSIA

Map Questions (Fig. 236). — (1) About how much of Europe is included in Russia? (2) What part of the distance from pole to equator is included? (3) What does this suggest concerning temperature and rainfall? (4) How much of the boundary of Russia is seacoast? (5) Name the seas which border it. (6) Name the mountains on or near the border. (7) What portion of Russia is occupied by plains? (Fig. 304.) (8) In what directions do the large rivers flow? Name the three longest. (9) What peculiar fact do you notice about the Caspian Sea? (10) Find Poland, Finland, and Lapland. (11) What parts of Asia are in the Russian Empire?

Size and Position. — Russia in Europe is larger than all the other European countries together; and the Russian Empire, which includes Siberia and other lands in Asia, occupies about one-sixth of all the land upon the globe. The empire extends from the Baltic on the west to the Pacific on the east, and within its borders is included a great variety of climate. What countries in North and South America approach it in area? In variety of climate?

In spite of its vast extent, the development of Russia is greatly hindered by the lack of good harbors. In this respect it contrasts strongly with Canada. It is true that the sea forms a large portion of the Russian boundary; but ARCHANGEL, the principal port on the White Sea, is ice-bound for nine months, and the Baltic ports for four or five months each year. Besides this, the entrances to the Baltic and Black seas are guarded by foreign nations. Why are the Caspian ports of little use?

Physiography. — Most of the large rivers in western Europe have their sources in the mountains. Give examples (Fig. 229). It is not so, however, in Russia, where the central divide is a low, hilly region less than twelve hundred feet above sea level at its highest point. Aside from the mountains along the border this is the highest part of Russia. How does it compare in altitude with the highest point in flat Holland?

From what has been said, it is evident that most of Russia is a remarkably level plain (Fig. 229). Since several of the rivers are very long, what must be true as to the velocity of their currents?

What must follow as to their value for navigation? What about the ease of canal construction?

In southeastern Russia, on the other hand, are the lofty Caucasus Mountains (Fig. 230), in which one of the peaks, the extinct volcano Mt. Elbruz, is the highest mountain in Europe. But, at the very base of these mountains, bordering the Caspian Sea, are broad plains which in places are even lower than the level of the sea.

Fig. 284.

A Laplander's hut. The home of the Laplander is in northern Scandinavia and northwestern Russia.

The Caspian Sea, into which the longest river of Europe pours its floods, is the largest inland sea in the world. In spite of the enormous volume of water which enters these inland seas, the evaporation in that dry climate has caused them so to shrink in size that neither the Caspian nor the Aral Sea (Fig. 323) is now connected with the ocean. The surface of the Caspian is eighty-five feet below sea level, and by evaporation it is steadily growing smaller and salter, leaving broad, salt-covered plains round about it.

Climate. — The influence of distance from the ocean upon temperature and rainfall is well illustrated in Russia. Moscow is in the same latitude as Edinburgh; but while at Edinburgh the average temperature for January is 37°, at Moscow it is nearly 25° colder. Notice (Fig. 39) which summer isotherms pass nearest to these two cities. It was the severity of the Russian winter that caused Napoleon Bonaparte to lose nearly the whole of a great army when he was invading that country in 1812. What effect must this cold have upon navigation of the rivers?

Extreme drought, as well as extremes of temperature, are found in parts of eastern Russia. Although the rain-bearing winds meet with no barrier in sweeping over such level land, they nevertheless deposit so much moisture on the countries of western Europe that no part of Russia has heavy rainfall; and the eastern part averages less than twenty inches per year (Fig. 235). Since this amount is barely sufficient for agriculture, the crops suffer, and famines follow in

especially dry seasons. Southeastern Russia is altogether too arid for farming, being not only far from the ocean, but so far south that it is not greatly influenced by the prevailing westerlies.

People and Government.— The plains of Russia have offered no better barrier to the inroads of invaders than to the winds. We therefore find many kinds of people united under Russian rule. Most of these belong to the white race, but to a different division from the German and British peoples. The Russians are *Slavs*, while the inhabitants of Germany, Scandinavia, and the British Isles are of the *Teutonic* division. But Russia also contains many Jews, Teutons, and other people, including the Lapps (Figs. 284 and 285) who are classed with the Mongolian race. All together not less than forty languages are spoken within the realm.

Fig. 285.
A Lapp boy from Lapland in Russia.

In former centuries, while other parts of Europe were advancing in civilization, Russia was being raided by outsiders and its progress retarded by conquest. The country was so remote from western Europe that it felt little influence from the growing civilization of the west. Moreover, approach by water was then difficult, because formerly the only Russian sea-coast was on the Arctic. It was not until the time of Peter the Great (1682–1725) that Russia began to learn the lessons of civilization from other European nations.

These facts help to explain why Russia is so slightly advanced in some directions. While the common people of other European nations were demanding greater liberty, and were constantly acquiring education, the mass of the Russians were kept in subjection and ignorance. They were mere *serfs*, who were little better than slaves to their lords, the nobles. Although the serfs were liberated in the middle of the last century, almost no attempt has been made to educate the masses, and at present they possess little liberty.

The government of Russia at present is in a very unsettled condition. The emperor, or *Czar*, is an absolute monarch, but since the conclusion of the war with Japan in 1905 and the horrible riots that

followed, determined efforts have been made by the people to secure representative government. Late in 1905 the Czar granted permission for the election of a parliament, which met for the first time in May, 1906. If the parliament succeeds in carrying out its wishes, a constitution somewhat similar to that of Great Britain will be the result. The peasants have had for many years a voice in purely local matters, but these rights are not very extensive.

FIG. 286.

A fisherman's house in Finland. Fishing is a very important industry in Russian waters; and there is a great demand for fish, owing to the number of fast days kept by the Greek Church, to which the majority of Russians belong.

Lumbering. — Nearly a third of European Russia is forest-covered, and the timber resources, as in Norway, are among the greatest of the country. This forest supplies not only lumber, but pulp for paper and bark for tanning. Many fur-bearing animals live in the forest, as was formerly the case in other parts of Europe.

Farming and Grazing. — Both in the forest region and on the open plains to the south, there is extensive agriculture. Fully nine-tenths of the people are supported by farming, which makes Russia primarily an agricultural country.

The most important crops are the grains, especially rye, wheat, barley, and oats. Russia ranks second among grain-producing countries, and wheat is one of its principal exports, Great Britain taking a large amount. Another important crop is hay; and potatoes, sugar beets, and flax are extensively raised in the cool temperate climate. In southern Russia the warm climate permits the culture of grapes, tobacco, and corn; and south of the Caucasus even olives and cotton are produced.

On the grazing lands of the steppes, which somewhat resemble parts of Alberta, many sheep, cattle, and horses are raised. The nomadic herdsmen, such as the *Cossacks*, still retain many of the customs of the shepherds and herders of Bible times, who dwelt farther south in Asia.

Mineral Wealth. — Some parts of Russia contain mineral deposits

of great value. In the Ural Mountains, for example, are gold, silver, copper, platinum, and other metals, besides some precious stones and graphite, or "black lead," which is used in lead pencils.

Coal and iron are mined in several parts of Russia (Fig. 231), and each year the amount is increasing. As in Great Britain, some of the iron ore is so near coal and limestone that it is easily smelted.

Russia ranks second among the countries of the world in the production of petroleum. This oil is found in several places, especially at BAKU on the Caspian. But since its quality is not of the first class, it is less useful for kerosene. Large quantities are therefore consumed as fuel for steamers on the Caspian Sea and the Volga River; and the oil is also used in locomotives.

Manufacturing. — Although numerous factories have recently been established in Russia, about six-sevenths of the manufacturing population carry on the work by hand in their own homes. What a contrast to Great Britain with its almost countless factories!

Distilling and brewing are the principal forms of manufacturing not done in the homes; then come cotton manufacturing and sugar refining, while flour mills, woollen and linen factories, and iron works follow What raw products of Russia encourage these industries?

PRINCIPAL CITIES AND THEIR COMMERCE

Moscow and Nijni Novgorod. — The former isolation of Russia from other countries is illustrated by the fact that the principal cities were for a long time situated far in the interior. For example, MOSCOW, the second city in size and one of the chief manufacturing centres, and once the capital of the empire, is located almost in the centre of the realm, as Madrid is in Spain. The point was well chosen, because rivers, which canals could easily connect, diverge from this section in all directions. By the introduction of railways the advantage of this location was so increased that Moscow is now the great railway centre of Russia, as Madrid is of Spain, and for the same reason. State this reason. But the land about the city, unlike that around Madrid, is fertile and densely populated.

Not only is Mosc[illegible] adorned with royal palaces and government buildings, but it is th[illegible]y city of Russia, and therefore has numerous convents and churches (Fig. 287). The University of Moscow, the largest in the empire, is attended by about four thousand students.

East of Moscow, on the Volga River, is NIJNI NOVGOROD, renowned for its annual fairs. A great trade centre is needed [illegible]newhere in this

region for the exchange of Asiatic and of Russian products, and this city is suitable for the purpose because of its superior water connections. Point them out (Map, Fig. 236). The fairs, held in August and September, are the greatest in Europe, and attract as many as two hundred thousand strangers annually. In a single season goods are exchanged to the value of nearly $200,000,000, and prices are fixed on cr[illegible]nd other materials for the [illegible]; year. Why could not [illegible]n a centre for trade be better located upon the Caspian Sea?

Fig. 287.
Greek Church at Moscow.

St. Petersburg. — While the two cities just described are very old, their position in the interior is not well adapted for communication with distant nations. It was this fact which led Peter the Great, in 1703, to found St. Petersburg at the head of the Gulf of Finland. The site selected is very marshy, and the climate is cold, foggy, and unhealthful. Moreover, the arm of the sea on which the city is situated is so shallow that a ship canal twenty miles in length has been necessary to connect it with the deeper water farther west. In addition, the harbor is ice-bound for more than four months each year.

Fig. 288.
St. Isaac's Church in St. Petersburg.

Yet in spite of all these disadvan-

tages, St. Petersburg is already the largest city in Russia, and the fifth in size in Europe — facts that show how much such a seaport was needed. It is also one of the most magnificent of cities, having especially wide streets, splendid public buildings, and fine residences. More goods are shipped by this route than from any other Baltic port. RIGA, to the southwest, has about half as much shipping.

Odessa. — Odessa, another important port, was founded a little over a century ago, when Russia obtained possession of the northwestern coast of the Black Sea. Since the harbor is rarely frozen over for more than a few days, it possesses a great advantage over St. Petersburg, which it equals in its shipping trade. Besides being the chief outlet for the vast grain trade of southern Russia, and the principal port on the Black Sea, Odessa is an important flour-milling centre, like Minneapolis.

Warsaw and Lodz. — Thus far the Russians have found no opportunity to obtain possession of Constantinople, although they have, no doubt, felt many a yearning in that direction. Why? But their progress in the west has not been confined to the establishment of seaports. They have extended their territory in various directions, one of their most important acquisitions being a large part of *Poland*, in which are situated two of the leading cities of Russia, — WARSAW and LODZ. The former is a centre for the railways that connect Russia with western Europe, and the latter is an important manufacturing centre. Much coal and iron are mined in this vicinity.

Finland, whose capital is HELSINGFORS, although a part of the Russian Empire, has a measure of independence. There is a parliament which makes laws, but the Czar has the right of veto. Unlike the Russians, most of whom belong to the Greek Church, the Finns are Lutherans. Mistreatment by the Russian government has recently led to the migration from the country of many Finns and Poles. The policy of the Russians seems to be to destroy the nationality of these peoples.

REVIEW QUESTIONS. — (1) Tell about the size of the Russian Empire. (2) What can you say about its position with reference to the sea? (3) Describe its surface features. (4) Tell about the rivers. (5) Tell about the Caspian Sea. (6) How does the climate vary? (7) Tell about the people. (8) What about the government? (9) Tell about lumbering. (10) What are the principal farm products? (11) What about grazing? (12) What mineral products are found? Where? (13) For what purpose is some of the petroleum used? (14) What is the condition of manufacturing? (15) Tell about each of the cities: (*a*) Moscow — location, comparison with Madrid, importance; (*b*) Nijni Novgorod — location, fairs; (*c*) St. Petersburg — location, surroundings, importance; (*d*) Odessa — location, importance; (*e*) Warsaw; (*f*) Lodz. (16) What are the conditions in Finland?

Suggestions. — (1) Compare the area of the Caspian Sea with that of Lake Superior. (2) Read about how the inhabitants of Moscow burned their houses in 1812 rather than give shelter to Napoleon's army. What followed? (3) What must be some of the difficulties connected with building good roads in southern Russia? (4) What did Kosciusko, the Pole, do to make his name memorable? (5) Have you read the story of Thaddeus of Warsaw? If so, what can you tell about it? (6) Read how Peter the Great wandered through European countries as a common workman, in order to obtain the benefit of Western ideas. (7) Make a sketch map of Russia, with principal rivers, cities, etc. (8) Where else besides on the Atlantic, Pacific, and Mediterranean does Russia desire an opening to the sea? (9) Find out what you can about the recent war between Russia and Japan. (10) What about the present condition of the Russian people? (11) Find out about the recent attempts of the Russian people to obtain for themselves freedom of government. (12) What is the Douma? (13) What books have you read by Russian writers? (14) Find out all you can about Count Tolstoi. (15) Who are the Nihilists?

VIII. GERMAN EMPIRE

Map Questions (Fig. 293). — (1) Compare the latitude of Berlin with that of London. (2) Of Winnipeg. (3) Estimate the greatest length of Germany from east to west. From north to south. (4) How does it compare in size with the British Isles? Russia? (5) How much of the boundary is natural? (See also Fig. 293.) (6) Point out the principal rivers. To what extent do they correspond in general direction? (7) Is most of the surface plain or mountainous? (Fig. 229.) Where are the mountains? (8) What facts do you notice about the coast line? (9) Is the North Sea or the Baltic the more favorable place for seaports? Why?

Extent and Position. — The German Empire contains 209,000 square miles, which is an area a little larger than France and ten times the size of Nova Scotia. But it has about 56,000,000 inhabitants, or one hundred and ten times as many as Nova Scotia and 17,000,000 more than France.

The position of this great nation offers a marked contrast to that of Great Britain. Only about one-third of its boundary is water, while its frontier comes in contact with seven independent countries, aside from Luxemburg. What are their names?

The location of the British Isles is regarded as favorable for world commerce, inasmuch as densely populated Europe lies near at hand on one side, while the far-away New World is on the other side. The situation of Germany possesses great advantages, also. Owing to her central location, most of the markets of the continent are at her very doors, while two of her principal ports, Hamburg and Bremen, face Great Britain and the West. On the map (Fig. 293) find some of the large cities that can be quickly reached from Germany. In these days of railways, Germany's central position is superior to that of England for European trade.

People and Government. — It has required a great struggle, which has lasted through centuries, to bring under one rule the various people within the boundary line of the German Empire. For centuries there was, at best, only a loose confederation to hold them together; and the numerous states which occupied the region were often at war with one another and with surrounding nations. A fierce struggle for supremacy was almost constantly carried on among the more powerful states. This jealousy was intensified by their

powerful neighbors, who hoped to derive some advantage for themselves from these continual contests.

During the War of 1866 Prussia and Austria, the principal kingdoms of the *German Confederation*, strove with each other for the exclusive leadership. Prussia proved successful, and Austria withdrew from the union. In 1871, during the war with France, known as the Franco-Prussian War, the new *German Empire*, with its present boundaries, was established.

All together there are twenty-six states within the empire, some of them being *kingdoms*, some *duchies*, and some merely *free towns*. The smallest of all is the city of BREMEN, occupying only ninety-nine

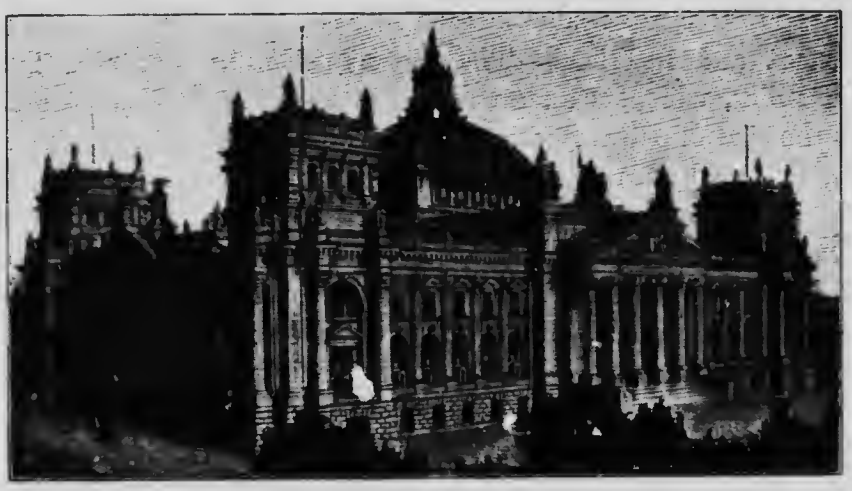


FIG. 289.

The German *Reichstag*, corresponding to our House of Commons, meets in this building, in Berlin. The other legislative branch, called the *Bundesrath*, is composed of members appointed by the various German states.

square miles, while Prussia, the largest, contains more than one-half of the entire empire, and in 1897 had a population of about 32,000,000. They are all united under a central authority. The German Empire is presided over by an Emperor (the King of Prussia being by law the German *Emperor*), and their form of government is a constitutional monarchy (Fig. 289). However, the power of the Emperor is much greater than that of the King of Great Britain, though less absolute than that of the Czar of Russia.

Defence. — The Germans in a war with France in 1870–71 not only defeated the French, but compelled them to pay a large sum of money. At the same time they seized the French territory west of the Rhine, called Alsace-Lorraine, in which Metz and Strassburg are

situated. This is a suggestion of the way in which much of Germany's irregular frontier line has been determined. To a great extent mountains form the southern boundary, and water the northern; but the eastern and western limits, largely decided by war, do not follow any natural barrier. Draw an outline map of Germany.

In order to preserve her present boundaries, Germany must be prepared to defend them at any time. This need calls many citizens to an occupation which we have not thus far considered, namely, that of *preparing for war.*

It is a fact that each of the great European nations is jealously watching the others, and as no one of them knows how soon a dispute may arise with its neighbor, each maintains a large and thoroughly equipped army. The object of each is to be so dangerous that others may fear to offend or attack it; and if once involved in war to come off victorious.

For such reasons all able-bodied young men in Germany are required to devote usually two full years and parts of several succeeding years to active military training. Most of them enter the service at about the age of twenty; and as there are about four hundred thousand males arriving at that age every year, one can obtain some idea of what it costs a European nation to have close neighbors. The peace footing of the German army is almost six hundred thousand men, which is larger than the number employed in all the mines of the British Isles. In addition to this, the German navy calls for many recruits. As all these men are, for the time being, withdrawn from industrial pursuits, the nation loses the fruits of their labor for that period. Thus the productiveness of the nation is reduced.

Extensive fortifications are built near the boundary, as at Cologne, Metz, and Strassburg on the French side, and Königsberg and Posen near Russia. They are also numerous in the neighborhood of the great interior cities, and at strategic points here and there. The expense of these fortifications, and the vast sums required to keep up the army and navy, form a heavy drain upon the nation.

Germany is not unlike the other European nations in these respects, As already stated, the British, having no immediate neighbors, rely mainly upon their powerful navy for defence. But every one of the Great Powers is calling for many men, and expending large sums of money either for the army or navy, or both. In fact, preparation for war is one of the great occupations of Europe to-day.

Physiography. — Germany consists of two quite different parts. The southern section is mainly a mountainous region of ancient date, and is therefore worn low, like the mountains of Great Britain and eastern North America. It is, in fact, a plateau from one to two

thousand feet in height, with some ranges, like the Erzgebirge, rising high enough to be commonly classed as mountains. Only in the extreme south, on the edge of the Alps, is a great altitude reached, one peak being nearly ten thousand feet above sea level.

Valuable minerals have been revealed by the wearing away of these ancient mountains; indeed, the mineral belt of southern Belgium and northeastern France is but a continuation of the highlands which cross southern and central Germany.

Northern Germany is a lowland, broadening toward the east until it merges into the plains of Russia. In the neighborhood of Holland the plain is very low and flat (Fig. 290): but in most places, owing to the irregular deposits left by the Scandinavian glaciers, it is rolling. Elevations in this part of Germany rarely exceed six hundred feet. This plain is, in large part, included in Prussia, the greatest and most powerful of the German kingdoms.

FIG. 290.

A view on the very level plain of North Germany.

Most of the drainage is northward into the North and Baltic seas. What river rises in the highland region of southern Germany, and crosses Austria, finally to enter the Black Sea? Name and trace the courses of four large rivers which flow northward. Of these the Rhine is the most important. Notice the large number of cities along its banks. While parts of the Rhine valley are broad and densely settled, the river in the central part of its course flows through a deep and beautiful gorge cut in the highlands.

Climate. — The average yearly rainfall is about twenty-eight inches, decreasing toward the east to about twenty inches near the Russian border. That these figures may be better appreciated, we may recall the fact that the average rainfall in most parts of Ontario is nearly forty inches.

Note the number of degrees of latitude included in Germany. Nevertheless, owing to the difference in elevation, the southern plateau is about as cold in winter as the northern lowland. In summer, however, the southern part is warmer than the northern. But the valleys of the south, being low and enclosed, are warmer than the northern plains both in winter

and in summer, and are therefore capable of producing such crops as tobacco and grapes.

The increase in extremes of temperature toward the east, or away from the ocean, is illustrated on the coast. The North Sea is almost free from ice, while the Baltic ports are frozen over for a time; and the farther east they lie, the longer their trade is arrested by the cold. What must be some of the results of this fact?

Forests. — That the mountains of Germany are low enough to be well wooded, is indicated by the frequent use of the word *wald* (the

FIG. 291.

A view on the Rhine at Bingen. Notice the opposite bank, where the earth has been terraced so that even the hill slope may be used for vineyards.

German for wood) in the mountain names. Where the soil is poor, as in the stretches of sand deposited during the Ice Age, much of the lowland is also wooded. All together about one-fourth of the surface of the empire is covered with trees.

The tendency of the German people to useful and sensible economy is well illustrated in their treatment of the woodlands. Instead of wantonly devastating them by fire and the axe — as has been done in so many parts of our own country — they maintain an excellent system of forest culture. Trees are planted in place of those that are cut for timber, these are given proper care, and thus the woods continue to be abundant. By this system, also, forest culture becomes profitable. It is partly due to the encouragement received from the success in Germany, that forest reservations have been set aside in various parts of Canada, and schools of forestry founded in connection with a number of Canadian universities, for the purpose of studying how to care properly for our woods.

Agriculture and Grazing. — On the whole, Germany has not a fertile soil; but the farm products are very extensive, because the people are both industrious and intelligent, and their method of cultivating the soil is excellent. What countries may well be contrasted with them in this respect?

More than one-third of the population are dependent for their living upon agriculture, the leading industry of the nation. Germany is one of the most important grain-producing countries of Europe; but here rye replaces wheat as the principal grain. Potatoes, introduced from America, are raised in such quantities that, like rye, they form one of the principal foods. These two crops are extensively cultivated, both because they are a cheap food, and because they flourish in the light soil and cool summer climate, characteristic of so much of Germany. Sugar beets, hay, oats, and barley are other important crops of the northern plains, while in the Rhine and other warm, sheltered valleys of the south, hops, tobacco, and grapes are raised in large quantities.

Since much of the lowland is too sandy for cultivation, and much of the highland too rugged, it is not surprising that one-sixth of all the surface consists of natural pasture. Cattle for beef and for dairy purposes are kept in nearly all parts of the empire, but especially in the damper climate of the west.

Mining. — Next to Great Britain, Germany is the greatest mining country of Europe; and, as in the United Kingdom, her most valuable minerals, coal and iron, often occur in the same region. Germany and Belgium together produce more zinc than all the rest of the world; and nearly half the silver obtained in Europe is mined in Germany. Much lead and copper also come from Germany.

The coal beds of Germany are widely distributed over the whole country. The coal fields that were found in Belgium and northeastern France extend into Germany in the neighborhood of AACHEN; and from this point eastward to the Russian border there are several important coal fields which are extensively worked.

There are also immense salt mines, as at STASSFURT, northwest of Halle, from which are obtained not only table salt, but products used in the manufacture of soap, in dyeing, bleaching, glass making, and calico printing. The Germans employ thoroughly scientific methods in their mining work; and it is from them that other nations have learned many of the methods which are employed in reducing ores to metal.

Manufacturing. — From the above facts we may expect to find Germany a great manufacturing country, with her manufacturing centres well distributed. Explain why.

About a third of the inhabitants are dependent upon manufacturing, and in recent years Germany has so advanced in this industry that she now ranks next to the United Kingdom in the quantity and excellence of her goods.

The distribution of the coal and iron gives the key to the principal centres for iron manufacturing. The busiest section is along the Rhine, in the vicinity of COLOGNE, which may well be compared with northern England in the extent of its industries. A second centre is about DRESDEN and CHEMNITZ, and a third at BRESLAU in the southeastern corner of the empire. As in other countries so far studied, the textile industries are best developed near the coal fields. Therefore the sections mentioned above are distinguished for cotton, woollen, and silk factories as well as for iron.

FIG. 292.

Storks at Strassburg, — a familiar bird in Germany, which builds nests on the chimneys.

The extensive forests partly account for a third occupation of many sections; namely, the manufacture of furniture, paper, and other materials made of wood.

The map (Fig. 293) shows no cities south of BRESLAU; yet a busy manufacturing centre exists there. The explanation is that the people carry on this work largely in their own homes, instead of in factories. Living in a hilly country, where agriculture is not very profitable, they spin and weave the flax and wool raised near by. They also make lace and carve wood; but, although villages stretch for miles along the valleys, there are no large towns.

The manufacture of spirituous liquors is another prominent German industry. A portion of the immense potato crop is made into spirits, and

also some of the beets. But beer, in which barley and hops are used, is the common beverage. From the grapes of southern Germany much wine is manufactured, though not nearly so much as in France.

For a long time nearly all sugar was obtained from sugar-cane, although maple trees supplied a small amount; but German chemists found a means of extracting sugar from beets. By improving the process, and by developing the beets until they contained more sugar, the great industries of sugar beet raising, and the refining of beet-root sugar, have been made possible. Each year this source of sugar has been proving a more formidable rival to sugar-cane, until now a large part of the sugar consumed in Europe, and even a part of that used in North America, is obtained from sugar beets. One important reason why this industry has thrived is that sugar beets grow in a cool temperate climate where population is dense and markets are numerous.

Formerly Germany had to rely upon foreigners for sugar; but since the development of this industry, beet sugar has become one of its greatest exports. Nevertheless, the population is so dense and so many are engaged in manufacturing, that, like the British, the Germans cannot raise all the food they need. Therefore much food, such as wheat and meat, as well as raw materials for manufacture, such as cotton, wool, and silk, must come from abroad.

Germany's Rapid Advance. — No European country in the last quarter of a century has experienced such rapid growth as Germany. For example, in the twenty-five years preceding 1895 her increase in population was over 11,000,000, while France had an increase of only 2,500,000. The empire has had a corresponding gain in wealth.

Undoubtedly the strong central government established in 1871, and with it the laying aside of the petty jealousies that paralyzed industries, is one cause of this advance. But there are many other causes, of which one of the most influential is education and the encouragement of science. Every German child is forced by law to attend school; and careful attention is given to the study of the various industries, foreign products, languages, etc. In the higher commercial and technical schools young men obtain excellent preparation for various kinds of business, while in many other countries there is little or no provision for such education.

The value of scientific work is fully recognized and encouraged by the government; and that such encouragement is profitable to the nation is proved by the wonderful development of the sugar industry, the mines, and the factories. Not many years ago much of the manufacturing was done by hand; but now the best machinery has been introduced, and Germany is one of the three leading manufacturing nations of the world. Name the other two.

FIG. 293.

MAP QUESTIONS: *Switzerland.*—(1) What countries surround Switzerland? (2) From which one is it least separated by mountains? (3) Compare the surface of Switzerland with that of Scotland. (4) What large rivers rise among the Alps? In what direction do they flow? (5) Do you notice any lakes among the Alps? (6) How does the area of Switzerland compare with that of British Columbia? (7) Name the most important places in Switzerland.

Colonies and Emigrants. — The recent acquisition of foreign territory is an indication of the growth of Germany. The empire is now in possession of extensive areas in the island of New Guinea, north of Australia, and in both east and west Africa, as well as smaller colonies elsewhere in the world.

Many Germans have emigrated to various parts of the New World, particularly to South America and the United States, although Canada has received a share. Naturally many of the German emigrants to other countries have kept up trade with their *fatherland*, and have thereby increased the commerce of Germany.

Principal Cities and their Commerce

After the preceding statements, it may not be surprising to learn that the leading German cities have experienced an extraordinarily rapid growth. In the twenty years between 1870 and 1890 the

Fig. 294.

The Dresden Art Museum.

population of Berlin increased by leaps and bounds, as many actual new residents being added during that period as were added to Chicago, the best example of surprising growth to be found on this continent. Other German cities have increased, and are still increasing, in population at a rate almost equally great.

Berlin. — The position of Berlin, on a small river, the Spree, on the North German plain, midway between the coast and the highlands, may not at first seem advantageous. But the Oder and some of the tributaries of the Elbe approach so near each other in this section that they have easily been united by canal. Thus Berlin has water connection with both HAMBURG and STETTIN, as well as with all parts of these two river systems, — a very important aid in obtaining fuel, food, etc., for the city. Observe also (Fig. 293) that Berlin lies on the direct route from Hamburg to Breslau, and from Stettin to Leipzig, and that other large cities surround it. It is, moreover, on the route of several great European railways, and is therefore one of the important railway centres of the continent.

With such excellent connections, by water and by rail, Berlin has naturally become one of the great manufacturing cities. Fully half the residents are supported by this industry, which includes brewing, the manufacture of fancy articles, clothing, machinery, etc. Besides being the capital of Prussia and of the German Empire, Berlin is the centre of German banking. It is noted for its art and music, and for its great university, the largest in the empire. There are a number of important suburbs, one being POTSDAM, the German "Versailles," in which are located several royal palaces.

FIG. 295.
A castle on the Rhine.

Interior Cities near Berlin. — Among the cities not far from Berlin is LEIPZIG, the fourth largest in the empire. It is situated at the junction of two small streams, at a point where roads from the highland meet those from the lowland. Formerly it was a centre for wagon roads, and now it has naturally become a railway centre. Owing to its favorable position, Leipzig is, next to Berlin, the most important trade centre of Germany. One of its leading articles of commerce is fur. It is the seat of a noted university, and a centre for the German book trade.

DRESDEN, southeast of Leipzig, is noted for its art museum (Fig. 294), which rivals the Louvre of Paris. The beautiful Dresden china is made in this vicinity, and in recent years much manufacturing has developed, for Dresden is situated on a navigable river and has coal near at hand. It is, moreover, the capital of Saxony, the most densely settled German state.

CHEMNITZ, near by, has important textile industries; and HALLE and MAGDEBURG, farther to the northwest, and in the centre of the chief beet-growing area, are extensively engaged in the manufacture of sugar.

BRESLAU, only a little smaller than Leipzig, is on a navigable river, and has the advantage of being near a very rich coal and iron field. It is, therefore, a great manufacturing city, and its situation near the frontier makes it an important market for eastern and central Europe.

FIG. 296.

The Cologne Cathedral, one of the most beautiful Gothic edifices in the world, was begun in 1248 and completed in 1880.

Seaports. — HAMBURG, which is about the same size as Glasgow, is the second city in Germany, and the most important seaport on the continent. The reasons for this are clear when it is known that the estuary of the Elbe makes an excellent harbor, usually free from ice, and that Germany has an extensive foreign trade. Name some articles which that port probably receives from America. What water connections has Hamburg with the interior?

BREMEN and STETTIN also admit large vessels, and are the chief rivals of Hamburg; but they together have less than one-half as much commerce as Hamburg. In what respects are they less favorably situated for commerce than Hamburg?

Name other Baltic ports beside Stettin. Which is a natural outlet for wheat from Russian Poland? Estimate the distance saved to the Baltic ports by the construction of the Kaiser Wilhelm canal, which is sixty-one miles in length.

Cities along the Rhine. — On ascending the river into Germany we come to the great manufacturing region already mentioned.

FIG. 297.
A scene in Frankfort.

What cities are there? COLOGNE, the largest, with a population of more than a third of a million, is on the river bank. It is a great shipping point, since railways cross the river, and boats from London and other places are able to ascend to this point.

ELBERFELD and BARMEN have textile manufactories; ESSEN is famous for the Krupp steel works; KREFELD is an important silk manufacturing town; AACHEN (Aix-la-Chapelle in French) manufactures woollen cloth.

Just beyond the great bend in the Rhine is FRANKFORT, on a navigable tributary, the Main, along which lies the easiest route from the Rhine valley to the Danube. Since the railway from the German plain to the upper Rhine passes Frankfort, it is a centre of important trade routes, and therefore one of the leading trading and banking centres in western Germany. It has long been a prominent city and was the capital of the old German Confederation.

Railways to the Danube pass through MUNICH, the capital of the kingdom of Bavaria. Although so far to the south, and so distant from coal, Munich is the third city in size in the realm. It is on the trade routes from Germany to Italy and to Austria, and is accordingly an important railway centre. Much of its renown is due to its art collections and its art industries, such as work in bronze, gold, silver, glass painting, and porcelain manufacturing.

North of Munich, on the road to Berlin, is NUREMBERG, a city widely known for its careful preservation of the old art and architecture that made it famous in former centuries, and for its present manufacture of toys.

REVIEW QUESTIONS. — Give (1) the area of Germany; (2) the population; (3) the boundaries. (4) What advantage does Germany's position give her for European trade? Tell about (5) the early condition; (6) the government; (7) preparation for war; (8) physiography; (9) rainfall; (10) temperature; (11) forests; (12) agriculture; (13) grazing; (14) mining; (15) manufacturing. (16) Give some of the causes for Germany's recent advance. (17) What about the growth of German cities? Tell (18) about Berlin; (19) cities near Berlin; (20) the seaports. (21) What about cities along the banks of the Rhine? (22) Give reasons for the importance of Munich.

SUGGESTIONS. — (1) Look in an atlas to find in what part of the empire the larger states, such as Prussia, Bavaria, Saxony, etc., are situated. (2) People often assert that the peace of Europe is preserved by extensive preparation for war; in what sense can this be true? (3) What must be some of the benefits of two years of active training in the army, aside from preparation for war? What some of the disadvantages? What relation has this to emigration? (4) What is the size of the standing army of Great Britain? (5) What seaports of Europe most nearly approach Hamburg in size? (6) How may the Kaiser Wilhelm canal possibly prove an injury to Hamburg? (7) Show that Germany in her industries resembles Great Britain, while contrasting with Russia and Norway. (8) Find out something about Goethe, Schiller, Humboldt, Emperor William the First, Bismarck, Von Moltke, Wagner, and Schumann.

IX. SWITZERLAND

Physiography and Climate. — This is a very mountainous country (Figs. 298–302), for the Jura Mountains are on the northwestern border, while the Alps occupy the southern half. Between these two mountain systems, which extend northeast and southwest, is a low, hilly plateau, from one to two thousand feet in altitude. About one-third of Switzerland is included in the plateau belt. In so rugged a country one would not expect to find a large population; yet Switzerland is almost as densely settled as France, and much more so than Ontario.

FIG. 298.

A glacier in the Swiss Alps.

It is evident that the temperature of this mountainous country must be low, and that it must vary greatly with the altitude. This is well illustrated in the Alps, at whose base are found chestnut and walnut trees, which are replaced higher up by beech, maple, and other trees of the cool temperate zones, and still higher by a belt of evergreens. Above these come dwarfed trees, shrubs, grass, etc.; and higher still, at an average elevation of about nine thousand feet above sea level, the snow line is reached.

The numerous lofty mountains, rising in the path of the prevailing westerlies, cause Switzerland to be one of the wettest countries on the continent. On the higher mountains much snow falls, and, sliding down the mountain sides in the form of avalanches, it gathers in the valleys to pro-

duce streams of ice, or *glaciers* (Fig. 298). These move slowly down the valleys until they reach a point below the snow line where the ice melts. They there deposit terminal moraines, which, though smaller, resemble the moraines made by the continental glaciers of the Ice Age. The Rhone and many other rivers are supplied with water by the melting of the Alpine glaciers.

Fig. 299.
A Swiss peasant costume.

People and Government. — People who dwell among mountains develop a spirit of independence, as is illustrated by the story of William Tell. Thus we find that, as early as 1291, an agreement was made among a few of the small Swiss states, or *cantons*, for mutual protection against oppression. Many a time since then foreigners have attempted to conquer the Swiss; but, aided by the difficult approaches to their country, and by the mountain fastnesses to which they could retreat, they have been able to maintain their freedom, although the entire area of the country is only five-sevenths that of Nova Scotia. Their twenty-two cantons, united on the federal plan, now constitute a republic, the neutrality of which is guaranteed by the Great Powers of Europe.

But while there is one stable government, there is not one common language. The country is most open toward the north, for the plateau of Switzerland merges into that of Germany. Naturally, therefore, German-speaking people are most abundant, making up 72 per cent of the population. The approach from France is much more difficult, and the French population constitutes only 22 per cent of the whole, while but 5 per cent speak Italian.

Farming. — Owing to the mountainous condition, only one acre in nine is fit for the plough. Yet agriculture is the principal industry. On the lower lands grain, grapes, and the silk-worm are raised, as in the neighboring countries; and on the lower mountains dairy-farming is important, as might be expected. The population is so dense, however, that much food must be imported, though some products, such as cheese and condensed milk, are exported.

Manufacturing.—Switzerland is very poor in mineral deposits, and coal is entirely lacking. This scarcity of raw materials would suggest that there is little manufacturing, but the inference is false. That the Swiss possess marked mechanical skill is indicated by the remarkable wood carving for which they have long been noted. In spite of the absence of coal, cotton, and ore deposits, they have engaged extensively in the manufacture of light articles, such as textile goods, jewellery, etc.

FIG. 300.

A view of Lake Lucerne. The wall on the left bounds a road which is cut in the rock on the mountain side.

The commercial position of Switzerland is advantageous, since it is entirely surrounded by densely populated countries which supply raw materials and furnish a market for manufactured goods. The influence of the latter fact upon the cities is very marked.

Leading Cities.—The largest city, ZURICH, on Lake Zurich, is an important railway centre. The St. Gothard railway, which runs northward from Genoa and Milan, connects the city with Italy, while other railways bring it in touch with France, Germany, and Austria. These roads are especially important for the introduction of foods and raw materials for manufacture. Therefore Zurich is the centre of one of the principal manufacturing districts, and is itself especially noted for the manufacture of silks, cotton, and machinery.

The *St. Gothard Tunnel*, from which the railway takes its name, was, until the completion of the *Simplon Tunnel*, a short distance to the west, the longest tunnel in the world, and is a marvel of engineering skill. Before reaching the main tunnel several smaller ones are entered, through which the train winds in a spiral course, so that once or twice a passenger comes out of the mountain almost directly over the point where he entered it; and in some cases he can see far below him two places, one above the

other, at which the train entered to follow its spiral course in the mountain rock. This method of construction is rendered necessary because the grade is so steep that a train could not be drawn directly up a straight track. The main tunnel, which is nine and one-fourth miles long, is quite straight. Since silk-making is the chief manufacturing industry in Switzerland, these tunnels, by opening connection with the raw silk market of Italy, have greatly aided in its development.

FIG. 301.
The Matterhorn peak, one of the steepest in Switzerland.

BASEL, which forms the second centre of population in Switzerland, is the busiest railway point in the country. It is on the main line of the St. Gothard railway, and on the Rhine where it enters Germany from Switzerland. Why is its position, near both France and Germany, favorable to manufacturing?

GENEVA, situated on the southwestern end of Lake Geneva, where the Rhone enters France, is a noted educational centre. It is on a very ancient and important trade route from southern France to Germany, and therefore has excellent railway connections. Water power is much used in generating electricity for use in manufacturing, and the city makes jewellery and scientific instruments.

BERNE, the capital, is centrally located; but it is a small city because its situation for commerce is not favorable.

Scenery and Tourists. — Many of the Swiss cities are beautifully situated upon lakes, and within sight of mountain peaks always covered by snow. LUCERNE, for example, is surrounded by most beautiful and varied scenery. The city is located upon Lake Lucerne, and lofty mountains rise in the immediate neighborhood (Fig. 300). Mts. Rigi and Pilatus are near by, and from their summit one obtains a magnificent view of the

lake, bordered by green meadows and numerous villages, over four thousand feet below; while in several directions, as far as the eye can reach, are the crests of stupendous, jagged mountains. On account of such scenery Switzerland is the most noted summer resort of Europe.

FIG. 302.

Lake Geneva, in a valley among the Alps. The Rhone River flows out of this lake.

REVIEW QUESTIONS. — (1) What are the principal physiographic features? (2) How does the temperature vary? (3) What about the rainfall? (4) Tell about the glaciers. (5) Give reasons why the Swiss have been able to maintain their independence. (6) What about their language? (7) What about raw materials? (8) Give reasons for the development of manufacturing. (9) For what is Zurich important? (10) Tell about the St. Gothard Tunnel. (11) Tell about (*a*) Basel, (*b*) Geneva, (*c*) Berne. (12) Why do so many tourists visit Switzerland?

SUGGESTIONS. — (1) What other factors besides altitude cause great variety of climate in Switzerland? (2) How may the lakes act as filters and regulators for the rivers? (3) The Rhone enters Lake Geneva laden with sediment derived from the glaciers; but it leaves the lake clear of sediment. By such deposits extensive deltas are built in all of the lakes. Of what value is that fact? (4) What special reasons are there for giving particular attention to the study of English and other foreign languages in the Swiss schools? (5) Why has Switzerland, unlike many European countries, not come into possession of colonies? (6) Find the meaning of referendum and popular initiative in Swiss legislation. (7) Why should Switzerland be selected as a place of refuge by persecuted people and political refugees from other nations? (8) Read that portion of the story of William Tell which is supposed to have occurred about Lake Lucerne. (9) Compare the Simplon Tunnel with the St. Gothard. (10) Compare these two tunnels with any that you know about in America.

X. ITALY

Map Questions (Fig. 293).— (1) Of what does the shape of Italy remind you? (2) How does its latitude compare with that of Spain? (3) What neighboring islands belong to it? (4) Point out the principal river. (5) How are the lofty mountains in the north likely to affect the climate? (6) What countries border Italy? (7) What seas border the peninsula? (8) How does its position seem to be advantageous for commerce?

Extent and Position.—Italy is "the very heart of the Mediterranean lands, and plays a great part as a link in the chain of communication between northwestern Europe and the Far East." For example, mails from London to India go by rail to Brindisi in southeastern Italy, and thence by steamer. What countries in Africa lie nearest to Italy? Estimate the distance to them.

The area of Italy, including the islands of Sicily and Sardinia, is only one-half that of Ontario, but its population is about 32,000,000. It is the smallest of the six Great Powers, but is the most densely populated of any except the United Kingdom. Name the Great Powers.

People and Government.—The inhabitants of Italy are a mixture of many peoples. In early times, the central position of the Italian peninsula was of importance in aiding the government at Rome to control the lands bordering on the Mediterranean Sea. At that time people from the surrounding lands of Europe, Asia, and Africa were brought to the peninsula, often as slaves captured in war. Later, when the power of the Roman Empire was weakened, hordes of barbarians invaded Italy. Nevertheless, the permanent settlers have invariably been won over to one language; and Italian, which is a growth out of the Latin of the ancient Romans, is now the universal tongue.

For centuries Italy was broken up into a number of separate and independent kingdoms; but here, as in other countries, the tendency of recent times has been toward unity. In 1860 several of the independent states united to form the kingdom of Italy; and later others were added, until, in 1870, or about the same time that the German Empire was formed, the present kingdom was established with Rome as its capital. Like most of the European countries, Italy is governed by a limited, or constitutional, monarchy.

Physiography and Climate. — The Italian peninsula is mountainous throughout most of its extent. In the north are the Alps, some of whose highest peaks are on the boundary line between Italy and Switzerland. The Alpine ranges curve around in northwestern Italy and join the Appennines, which extend the entire length of the peninsula and form its very backbone. The principal lowlands, therefore, are the narrow coastal plains and the broad Po valley.

We think of Italy as a sunny land of flowers, although Milan and Venice are just a little north of the 45th parallel. One reason for the pleasant climate is that the lofty Alps form a great wall which cuts off the cold north winds. Another reason is that the peninsula is under the equalizing influence of the Mediterranean, whose waters have a temperature of over 50°. On these accounts the Italian winters are mild, and in the extreme south the temperature seldom falls to the freezing point.

FIG. 303.
An Italian team at Naples.

Much of Italy has an abundance of rain; but, except in the north, the greater part comes in winter. The summer drought is due to the fact that the horse-latitude belt moves northward in summer; therefore southern Italy at that season resembles southern Spain in climate.

Agriculture. — Such a climate, together with a fertile soil, helps to explain why agriculture is the principal industry in Italy. Among the products are many that thrive in semi-tropical climates, as well as others that are common in the countries of northern Europe. The climate is so favorable that with the aid of irrigation, from four to ten crops may be raised in a year.

The most extensive farming district is the fertile plain of the Po basin. There is an abundance of rainfall; yet the people depend upon irrigation more extensively than in any other part of Europe. There are several reasons for such extensive irrigation. In the first place, the fact that the tributaries have their sources in the mountains, and often in the glaciers and snows of the Alps, insures a permanent supply of water to the gently

sloping land. Besides this, the rivers frequently flow through lakes — some of them among the most beautiful in the world — which act as great reservoirs for water supply.

Where irrigation is so easy, the extensive cultivation of rice is possible. This is an important crop in northern Italy, but corn and wheat are raised in still greater quantities. Grapes are cultivated to such an extent that Italy ranks second among the wine-producing countries of the world; and so many silk-worms are reared that raw silk is the most valuable export of the country. Among the other important products are eggs, which are exported in large quantities; also olives, oranges, lemons, flax, hemp, and wool.

Mining and Fishing. — There is a little iron, zinc, and copper ore; but one of the most important mineral products is the sulphur of Sicily; indeed,

FIG. 304.

A herd of goats in the streets of Naples. These are driven about the city, and even into the houses, to be milked.

until a few years ago this island produced most of the sulphur used in the world. Another important mineral product is marble of such rare beauty that it is prized the world over.

The fishing industry is important. Among the peculiar products of the sea are precious coral and sponges. You will remember that we found sponge fishing important also among the Bahama Islands.

Manufacturing. — As in Switzerland, electricity generated by water power supplies the place of coal to some extent. Consequently there is more manufacturing than one might infer from the lack of fuel. While much raw silk is produced, and there is some silk

manufacturing, a large part of the silk is sent to France, Switzerland, and elsewhere, to be made into cloth. There are also factories for woollen, cotton, and flax weaving, and for other purposes.

Fig. 305.

The leaning tower of Pisa, which has become tilted because of settling on one side.

Most European countries take pride in their fine art galleries; but Italy far surpasses them all and is the very storehouse of art, whether architecture, painting, or sculpture be considered. Accordingly, the characteristic manufactured articles are those of an artistic nature, as glass work, lace, earthenware, statuary, wood carving, coral carving, and straw plaiting. In what other country have we found that the artistic taste of the people greatly affects their manufactures?

Principal Cities. — Estimate the average width of the Italian peninsula. Since it possesses many excellent harbors, we may expect to find numerous large cities along the coast, as in Great Britain.

Naples and Vicinity. — The most populous city is NAPLES, in the southern part of the peninsula. The semicircular bay on which it is situated presents one of the most magnificent sights in the world. On the northwest is the city itself, — about twice the size of Montreal, — rising upon an amphitheatre of hills; toward the east is Mt. Vesuvius (Fig. 306), with the crests of the Appennines in the distant background; and on the southeast is a steep, rocky coast, behind which are numerous villages partly concealed among groves of orange, lemon, and palm trees.

This is one of the most fertile sections of Italy, — thanks to the ashes that have been thrown out of Vesuvius, — and the agricultural population is one of the densest in Europe. The harbor, too, is good, so that there is more shipping here than in any other Italian port with the exception of Genoa. But the secret of so large a city in this agricultural region is found partly in the peculiar character of the Italians, who feel a dread of isolated homes such as are common throughout the farming districts of

western Canada. Consequently they crowd into the villages and cities, even though they must travel a long distance to their field of work, or must suffer now and then from extreme want.

Within plain sight of Naples stands Mt. Vesuvius, a cone of lava and ashes nearly a mile in height, from the crater of which volumes of steam constantly pour forth. At the time of Christ the slopes of this mountain were dotted with productive farms, while thriving towns spread over the country at its base. But in the year 79 an appalling eruption took place which completely buried Pompeii, Herculaneum, and many villages beneath showers of ashes and streams of volcanic mud. Since then many eruptions have been recorded, the most violent ones being in 1872 and 1906. During the last half-century the buried cities, especially Pompeii, have

FIG. 306.

A view of Vesuvius, with a part of Pompeii in the foreground.

been unearthed at great labor and cost. By these excavations much has been learned about the buildings and customs of the people who lived nearly two thousand years ago.

The eruption of Vesuvius in April, 1906, was the most disastrous since the destruction of Pompeii and Herculaneum. Four towns and a number of villages were wiped out and more than two thousand people killed. The lava stream reached Pompeii, and ashes fell over the surrounding country in such quantities as to break down in Naples, twenty miles distant, the roofs of large buildings with their weight. During the eruption the top of the mountain was blown off, the present crater being 700 feet lower than before the explosions began. The eruption was accompanied by terrific electrical storms and violent earthquakes.

Ancient and Modern Rome. — By far the most interesting spot in Italy is ROME, the "Eternal City," long the capital of the ancient world, and now of modern Italy.

The site of Rome was well chosen. It lies near the centre of the Mediterranean, and near the centre of the Italian peninsula as well. In that part of Italy the fertile coastal plains are broad and are intersected by the Tiber, the largest river of the country except the Po. In that vicinity, also, the Appennines reach their highest altitude, which insures abundant water supply for the Tiber and for the plains. Moreover, the valley of the Tiber offers one of the most convenient routes across the peninsula. These are some of the advantages that attracted to ancient Rome a population of fully a million, and caused the surrounding country to be thickly settled and carefully tilled.

Fig. 307.

The Sistine Chapel — in the Vatican, the residence of the Pope.

Now, however, the city contains less than half as many inhabitants, while the neighboring plains for miles around, though beautiful pasture land, have scarcely a tree or a house upon them. The reason for this lack of suburban life is the very prevalent malaria. At present, the country is of use for little else than grazing; and as summer approaches even the herdsmen flee with their cattle and sheep to the mountains.

But while agriculture and commerce do not flourish near Rome, fine residences, public buildings, art galleries, and notable ruins are numerous in the city. The dome of *St. Peter's* — the largest and most famous church in the world — towers above everything else; and the *Vatican*, where the Pope resides, is the largest palace in Christendom. In the Vatican are some of the finest and most beautiful of paintings (Fig. 307).

The ruins of ancient Rome vie in interest with these products of later Rome, and cover so many acres that the city is almost as much a tomb as a living city. The most conspicuous relic of the past is the *Colosseum* (Fig. 308), a huge, oval-shaped theatre, open to the sky, with seats for forty or fifty thousand persons. In the days of the Roman Empire it was used to witness life and death struggles between men, and between men and wild beasts.

The *Forum* is another extensive ruin within the city limits. It was the great public square, on a lowland between some hills; but its monuments, arches, and other ornaments were covered with rubbish during the centuries succeeding the fall of the Empire. The excavation of this famous spot has not yet been completed, whole buildings, as well as smaller objects, having been buried in that locality.

Other Italian Cities. — With the exception of Rome and Naples the large cities of the Italian peninsula are in the northern part.

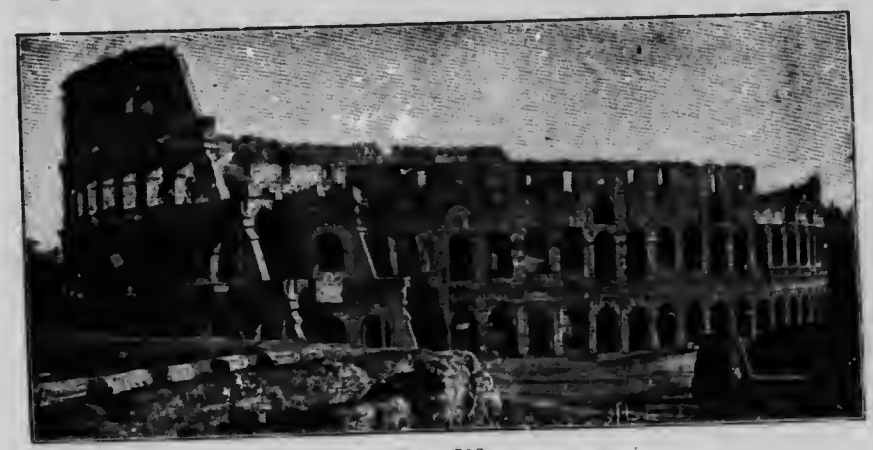


FIG. 308.

Ruins of the Colosseum, at Rome.

The principal city south of Naples is PALERMO, the capital of Sicily, and about the size of Montreal. It is situated in the midst of extensive fruit groves. What fruits would you expect to find there?

The first large city north of Rome is FLORENCE, on the western base of the Appennines, at a junction of roads across the mountains. Straw plaiting, mosaic work, and silk manufacturing are important Florentine industries; and the city is famous for its art galleries.

MILAN, the third Italian city in size, owes its importance largely to its location at the crossing of roads running east and west in the Po valley, and north and south over the Alps. TURIN has flourished for a similar reason. From very early times these cities have been important trade centres because of their position at the crossing of

trade routes in a fertile, densely populated valley. The railways across the Alps have greatly increased their importance.

MILAN possesses a magnificent cathedral built of white marble and adorned with more than a hundred spires and fully four thousand statues. On the wall of an old monastery in Milan is Da Vinci's famous painting, "The Last Supper," copies of which are often seen in our homes. The city is the centre of the silk trade, and manufactures much cutlery.

GENOA, although separated from the Po Valley by the low Appennines, is the natural port of Milan and Turin. Since it is a port of outlet for so fertile a region, and is now connected with central Europe by railway, this city is the most important seaport in Italy.

The principal seaport of the Adriatic is VENICE, one of the most interesting European cities. When hordes of barbarians were invading Italy, some of the residents retreated to a number of small islands in a lagoon, protected from the sea waves by low sand bars. The people developed into a hardy, independent race, largely through contact with the sea. Their very position forced them to become sailors; and the site of their city was favorable for commerce between central Europe and the East. Protected from attack by land, Venice rose in power, and with power came wealth. Many beautiful houses, churches, palaces, and museums are reminders of the ancient splendor.

FIG. 309.

A view of a part of Venice.

The city is built upon more than a hundred small islands, about two and a half miles from the mainland, with which it is now connected by railway. Naturally, canals take the place of streets. There are one hundred and fifty canals, the main one, or Grand Canal, being flanked on either side by fine residences, the steps of which lead down into the water. Nearly four hundred bridges join the different islands, and there are many narrow footpaths, but since the chief thoroughfares are canals, *gondolas* (Fig. 310) take the place of wagons, carriages, and street cars. No doubt thousands of children in that city have never seen a horse.

San Marino and Malta. — *San Marino*, although surrounded by lands that belong to the Kingdom of Italy, is, like Andorra, a tiny, independent republic. It is the oldest and smallest republic in the world, and owes its independence partly to the fact that the city is on a high hill and, therefore, difficult to capture.

South of Sicily is the small island of *Malta* (Fig. 236), which, like Gibraltar, belongs to Great Britain, and is strongly fortified.

FIG. 310.

A gondola in Venice — the ducal palace, or palace of the Doges, is seen on the farther side.

REVIEW QUESTIONS. — (1) In what respects is Italy's position favorable? (2) What about the size of the peninsula? (3) Tell about the origin of the people. (4) Tell about the government. (5) What are the principal features of the physiography? (6) What factors equalize the temperature? (7) Tell about the rainfall. (8) What crops are raised? (9) Of what value is irrigation? (10) What conditions especially favor it in the Po Valley? (11) Name the leading agricultural products. (12) What mineral products come from Italy? (13) What other raw products? (14) What about manufacturing? (15) Write from memory a brief description of Naples and vicinity, including Vesuvius and Pompeii. (16) Give the reasons for the location of Rome. (17) What changes have occurred since the days of the Roman Empire? (18) Tell the principal facts about each of the following cities: (*a*) Palermo, (*b*) Florence, (*c*) Milan, (*d*) Turin, (*e*) Genoa, (*f*) Venice. (19) Tell about San Marino and Malta.

(1) Why should Italy have been relatively much more important in former times than now? (2) What colonies has Italy in eastern Africa? Suggest reasons why Italy has so few colonies. (3) What must have been the influence upon Genoa and Venice of the discovery of the ocean route to India? Why? (4) What must have been the influence of the opening of the Suez Canal? Why? (5) Would you expect that Italy would have a large navy? Find out how her navy ranks with those of Great Britain, France, Germany, Russia, and Austria. (6) Mention advantages and disadvantages of life in Venice. (7) Mention some of the uses of sulphur. (8) Make a collection of the different famous pictures of the Madonna. (9) Find out about the Catacombs of Rome; the Roads; the Aqueducts. (10) Find out about some of the ancient Romans and Roman customs. (11) Ask some lawyer to tell you what influence Roman law has had upon our own law. (12) Find some facts about Cæsar, Cicero, and Dante.

XI. AUSTRIA-HUNGARY

Map Questions (Fig. 293). — (1) Compare Austria-Hungary with Germany in area. (2) Compare the two countries in population. (3) Compare the two in number of large cities. In which, therefore, would you expect to find most development? (4) About what proportion of the boundary is formed by water? (5) What countries border this empire? (6) What portions are mountainous? (7) What would you say about the variety of climate? (8) What sections do not belong to the Danube basin?

Physiography and Climate. — A large proportion of the boundary line of Austria-Hungary is determined by mountain ranges. Point out these ranges. Notice that the Russian boundary extends across an open plain. This plain is Austria's share of Poland, a kingdom which once extended from the Baltic Sea to the Carpathian Mountains. Poland was conquered and divided among Austria, Prussia, and Russia, Austria receiving the smallest share and Russia the largest.

Fig. 311.

A street in a small Alpine village of western Austria.

Austria-Hungary is one of the most mountainous countries in Europe. It includes the eastern half of the Alps (Fig. 311), besides several other ranges. These mountains together form a circle enclosing a broad plain (Fig. 312), through which the Danube River flows. At two points this circle is completely broken: once near Vienna, where the Danube enters the great Hungarian plain (Fig. 293), and again on the southeastern boundary, where the river leaves the plain.

The Danube valley is the great trade route of Austria-Hungary, since it offers the best passageway through the mountains. The fact that the river is navigable from Germany to its mouth adds greatly to the value of this route.

Transportation is all the more confined to the river route because of the peculiar coast line of Austria-Hungary. Although the country is next in size to Russia among European nations, it has only a small amount of coast. Estimate its length. There are numerous harbors, to be sure, but they are difficult of access from the interior, because of the rugged mountains that rise from the very seashore. At only two points on the Adriatic can good harbors be reached from the Danube lowlands without difficulty. What cities are located at these points?

In so mountainous a country there is naturally much variation both in

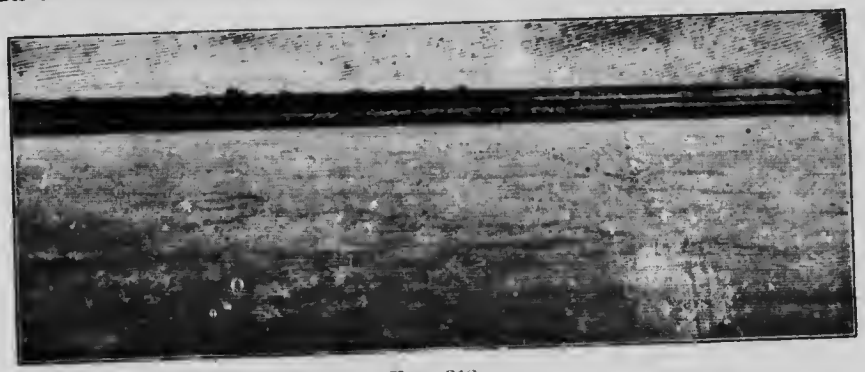


FIG. 312.

The Danube where it flows through the Hungarian plain.

rainfall and temperature. Everywhere except on the higher mountains, however, the temperature is favorable for the growth of grains and other crops of temperate latitudes. That is, the summers are warm and the winters are cold; but the extremes are much greater than in England. Why? The rainfall of the lowlands, which averages little over twenty inches, is barely sufficient for agriculture, and the plains of Hungary are subject to serious drought in summer.

People and Government. — Such a rugged surface, with many enclosed valleys, separates the people and favors the development of very different customs amongst the inhabitants of different sections. Moreover, the ease of approach from the north and east has led to repeated invasions from these directions. The result has been that the empire of Austria-Hungary is a mixture of many peoples. Germanic people, who form about a fourth of the entire population, are most numerous in Austria; while the Magyars, a race allied to the Mongolian, form nearly half the population of Hungary; but races related to the Slavs of Russia are more numerous than

either of the other groups. There are, in addition, large numbers allied to the Italians and other peoples (Fig. 313). German is the official language and is spoken by the educated classes.

There are at least a dozen languages in the empire, and often two or three are spoken in a single town. To be sure, a similar statement might be made in regard to some parts of our own country, more particularly the West, for we certainly have a great variety of languages. But no matter from what part of the world our citizens have come, they have, in most cases, greatly modified their former customs and have become or are becoming genuine Canadians in spirit.

Fig. 313.

A Gypsy family and hut in Austria-Hungary.

The many distinct peoples of Austria-Hungary resemble the Chinamen who come to America, in their tendency to remain apart. They are not only dissimilar in religion, ambitions, and customs, but their interests are often conflicting; and they are jealous and suspicious of, and often hostile to, one another.

It has been a difficult matter to bring these people under a common rule. Nevertheless, in 1867, the Austrian Empire and the kingdom of Hungary were united under Emperor Joseph to form the empire of Austria-Hungary. Each of the countries preserves its own constitution, makes its own laws, and is independent of the other in many respects. They work together, however, in matters of common interest, such as the army and navy, foreign affairs, and finance.

Natural Resources. — Many of the mountain slopes are forest-covered, and in the remoter parts wild animals are still found. Since nearly one-third of the empire is wooded, lumber forms one of the important resources of the country.

Where the woods have been cleared away, there are pastures for sheep and goats. Cattle are also raised, especially on the lowlands.

Near the Adriatic and in the warmer valleys there are many vineyards; and the mulberry is raised for the silk-worm, as in Italy and southern France. Flax, hemp, corn, sugar beets, and tobacco are other important crops. But the grains, especially wheat, rye, barley, and oats, are the staple agricultural products of both Austria and Hungary. The broad plains of the Danube (Fig. 312) form

FIG. 314.
The Parliament Building at Vienna.

one of the leading wheat-producing regions of Europe. A large amount of this grain is exported, since the people, like the Germans, live much upon rye bread.

There is much mineral wealth in the mountains, including deposits of salt, gold, silver, lead, mercury, and copper. The Hungarian opal is celebrated for its beauty; and the excellent quality of the clays has made possible the manufacture of fine porcelain ware. The mineral quartz supplies the material for the Bohemian glass blowers, who make some of the finest ware in the world.

Iron is widely distributed, and Austria-Hungary ranks third among the coal-producing countries of Europe (Fig. 231). Some of the best deposits are in the northwest, near PRAGUE, which explains why that city is extensively engaged in iron manufacturing.

Manufacturing and Commerce. — Austria-Hungary does not manufacture nearly so much as Great Britain, Germany, or France. Owing

partly to the poor facilities for commerce, and partly to lack of education and common interests among the people, there has been far less development of manufacturing than might be expected.

Much of the manufacturing is still done either by hand or by very simple machines. But there has been great progress in recent years, and numerous cotton, woollen, flour, and paper mills, iron manufactories, and beet-sugar refineries have been set up. There is also silk weaving. The chief manufacturing region is in the northwest, next to Germany, while the principal agricultural section is in the central and eastern parts.

FIG. 315.

Cut showing a castle in Austria, a little village at the base of the hill, and a mill at the left. Notice the thick walls, formerly of use to protect the castle from attack.

There is an extensive internal commerce along the rivers and the railways; but, owing to the limited coast line, ocean commerce is much less developed than in other large European nations.

The most natural trade route leads either down the Danube into the Black Sea or else westward into Germany, and thence down the Rhine valley. Why in these directions? Less than one-third of the foreign shipping goes by way of Trieste. This means that the greater part of the foreign trade of the empire is carried on through foreign ports. What disadvantages do you see in that fact? Trace the chief routes.

Principal Cities. — While there are many small cities in this empire, there are surprisingly few large ones. The two largest, VIENNA, the capital of Austria, and BUDAPEST, the capital of Hungary, are on the Danube River and not on the seacoast. Suggest reasons.

VIENNA, which is nearly as large as Berlin, is the greatest city in Austria-Hungary and the fourth largest in Europe. The reason for

its size is found first of all in its location, on a large river in the central part of Europe. Moreover, it is situated at an opening between mountains, through which, from the earliest times, the best routes have passed from western Europe to Asia, and from northern Europe to the Mediterranean. The railways which lead from St. Petersburg to Rome, and from Berlin and Paris to Constantinople, converge toward this point, making the city a great railway and trade centre.

BUDAPEST, consisting of two towns (Buda and Pest) on opposite banks of the Danube, is the seat of the Hungarian government and the home of the emperor for a part of each year. The city is in the midst of the great wheat-raising plains of the Danube, and, like Odessa on the Black Sea, is engaged in flour manufacture and grain shipment.

PRAGUE, the third city of Austria-Hungary, is situated on the navigable Elbe, which since early times has been an important trade route. Located in the midst of a rich mineral region, it is a noted manufacturing centre. TRIESTE, a city about one-half the size of Toronto, is the largest Austrian seaport. Although separated from the main part of the country by mountain ranges, it is connected with the interior by a railway. Even as far back as the time of the Romans, the pass which the railway takes in crossing the mountains was followed as the route of entrance to the Danube valley. FIUME, southeast of Trieste, has an excellent harbor.

Small Countries. — On the boundary between Austria and Switzerland is *Liechtenstein*, a very small independent country united with Austria-Hungary by a customs treaty. Two other countries, *Bosnia* and *Herzegovina*, formerly parts of Turkey, are now practically a part of Austria-Hungary, and are therefore not marked separately on our maps. They include the mountainous land northwest of Montenegro and Servia.

REVIEW QUESTIONS. — (1) Tell about the physiography of Austria-Hungary. (2) Tell about the climate. (3) What is the condition of the people? (4) What about the government? (5) Name the principal raw products. (6) What is the condition of manufacturing? (7) What about the commerce? (8) Give reasons for the location of Vienna. (9) Tell about the following cities: (*a*) Budapest, (*b*) Prague, (*c*) Trieste, (*d*) Fiume. (10) What is said about small countries?

SUGGESTIONS. — (1) How must the construction of tunnels through the Alps have affected Austria-Hungary? (2) What would you say as to the relative importance of the Danube and Rhine rivers? (3) Find some Bohemian glass to see how beautiful it is. (4) In an atlas look up Austria-Hungary to find the portions which are called Tyrol, Moravia, Bohemia, and Transylvania. (5) Look up some facts about the history of Poland. (6) Suggest reasons for the absence of Austrian colonies. (7) Find out something about the Triple Alliance. (8) Read about the influence of Emperor Francis Joseph in holding the different parts of the empire together. (9) Find out something about Kossuth.

XIV. THE BALKAN PENINSULA

Map Questions (Fig. 293). — (1) What countries border Roumania? (2) Name the countries south of the Danube. (3) What does the map tell you about the surface of each? (4) What may you expect about the variations in climate on this peninsula? Why? About the rainfall? Why? (5) Compare the number of large cities with the number in Germany and Italy. What inferences do you draw concerning the condition of the people? (6) Compare the area of Turkey in Europe with that of your own state.

Physiography and Climate. — This double-pointed peninsula is bounded on one side by the Adriatic and Mediterranean seas, on the other by the Ægean and Black seas. It is unlike other European peninsulas in having a very long land boundary. Trace it. Throughout almost its entire extent the surface is mountainous, which offers an explanation of the large number of separate countries on the peninsula. How? Many of the valleys are suitable to agriculture, the most extensive being the plains of the Danube in Roumania and Bulgaria.

Fig. 316.

A view in Bulgaria, showing its rugged surface.

The climate varies greatly from mountain to valley and from interior to seashore. Along the southern coast the winters are mild, as elsewhere near the Mediterranean; but in the northeast, near Russia, hot summers are followed by cold winters, when icy winds sweep down from the Russian steppes, and the Danube freezes over.

In so mountainous a land there is also much variation in rainfall. On the western slopes, for example near the shores of the Adriatic, there is an abundance of rain; but on the east coast and in the interior valleys, especially in Greece, there is so little rain that agriculture depends upon irrigation. Why is this true of Greece particularly?

People.—The eastern point of the Balkan Peninsula comes so close to Asia that it has been called a "bridge" between Europe and Asia. At each of two points, the Dardanelles and the Bosporus, the continents are separated only by a narrow strait, a barrier so slight that the animals and plants of the country belong to both European and Asiatic species. This region has also been a bridge for the passage of many peoples. Romans, various tribes of Slavs, and finally the Mohammedan Turks from Asia, have brought the peninsula under their dominion. Wherever the Turks went they brought ruin; and for four centuries, while the rest of Europe was advancing, they held this region in subjection and prevented progress. During the nineteenth century, however, many of its people have thrown off the Turkish yoke, so that Turkey in Europe is now less than one-quarter as large as it was a hundred years ago. Nevertheless, the effects of long Turkish misgovernment are clearly seen throughout the entire peninsula.

FIG. 317.
A Roumanian peasant.

Aside from Roumania, five nations now occupy the Balkan peninsula: Montenegro, Servia, Bulgaria, the Ottoman Empire or Turkey, and Greece; and two others, Bosnia and Herzegovina, are under control of Austria-Hungary.

FIG. 318.
A Turkish lady, at Constantinople, in street dress.

Montenegro.—This tiny principality, which is only a little larger than Prince Edward Island, has maintained its independence largely because of its situation among the mountains. The country is of slight importance; its soil is so poor that there is little agriculture; there is less manufacturing, and not a single railway. The principal occupation is cattle raising.

Servia.—Bordering on southern Hungary, Servia shares some of the advantages of that country, including navigation of the Danube. Since much of its surface is rugged and heavily forested, only a small portion is cultivated. Among the leading

products are corn, wheat, and other grains, reminding us of Hungary. There is also much fruit raising, particularly that of grapes and plums, which, when dried, are sold as raisins and prunes. Many cattle, sheep, and pigs are raised for export, the pigs being allowed to roam in the oak and beech forests. Why there?

The resources of Servia are only partially developed. For example, although coal, iron, lead, silver, and other metals are known to exist, there is very little mining and not much manufacturing. It will require more time to recover from the centuries of Turkish misrule.

The capital of the kingdom is BELGRADE, a city finely situated upon the Danube.

Roumania and Bulgaria. — These two countries have much in common. Although the Danube separates them for a long distance, they together control its lower course. This is a fact of much importance to Austria-Hungary. Why? Broad plains suited to agriculture border the Danube in both countries, though the plains are far more extensive in Roumania than in Bulgaria. Naturally, therefore, there is much farming. While each of these kingdoms has been freed from Turkish rule, Bulgaria is still tributary to that country; that is, although in most respects independent and self-governing, it is obliged to pay an annual tribute in money to Turkey.

In both countries wheat and other grains are among the chief crops. But the warmer climate of Bulgaria, south of the Balkan Mountains, permits the culture of products that cannot be raised extensively in Roumania; for example, the mulberry for silk, and roses for the valuable perfume, attar of roses. Many sheep as well as other live stock are raised in each country; in fact, herding is almost the sole industry on the barren steppes of eastern Roumania. There are large tracts of forest in each, but there is more in Bulgaria, owing to its rugged surface, than in Roumania. Each country has valuable mineral deposits; but, as in Servia, there is little mining. Why? Nor is there much manufacturing, except such hand work as the manufacture of Turkish rugs.

With so slight development of the resources, there are few large cities. By far the largest is BUCHAREST, the capital of Roumania. Find the capital of Bulgaria.

Turkey in Europe. — The Turks, who are Mohammedans, are controlled by ideas very unlike those of other Europeans. They are unprogressive and inclined to grant no rights to Christians, many

of whom still live in Turkey. Their ruler or *Sultan* has absolute power, which he exercises with little conscience, and the government is the worst in Europe.

Not only are the mass of Turks in ignorance and poverty, but they are not encouraged to develop the resources of their land. There are valuable mineral deposits, practically unworked; the great forest tracts have been nearly destroyed; and broad areas of farm land are cultivated by the use of oxen and tame buffaloes, and by the crude methods of early centuries. Among the principal crops are wheat, corn, flax, hemp, and tobacco. Figs, and grapes for raisins, are also raised. Cattle and sheep are numerous.

FIG. 319.
Map showing the location of Constantinople.

As in other slightly developed states, there is little production beyond raw materials; and while other nations in Europe have rapidly developed in manufacturing, Turkey produces chiefly hand-made goods. Among the latter are the famous Turkish rugs, and some very beautiful articles in leather and metal, showing that the Turks have much artistic skill. With so little industry there is naturally almost no means of transportation; in fact, the roads are everywhere bad, and railways are almost lacking.

CONSTANTINOPLE, the capital of the Ottoman Empire, has been famous for many centuries. Being situated on the Bosporus, where the beautiful, river-like outlet of the Black Sea passes through a valley in the low plateau, it commands the channel through which the commerce of the Black Sea must pass. This is a natural site for a city; for in addition to its location on this water route, it is the point where the crossing can best be made from Europe to Asia. The presence of a harbor on the European side — a small bay at the river mouth called the "Golden Horn" — and the fact that the founders were Europeans trading in Asia, rather than Asiatics trading in Europe, are reasons why a large city has grown on the European and not on the Asiatic side.

Greece. — The southern end of the Balkan peninsula is occupied by Greece. Owing to the many short mountain ranges extending in

different directions, the coast line is irregular, with numerous peninsulas, islands, deep bays, and fine harbors, formed by the sinking of the irregular land. The influence of the Mediterranean causes a warm, pleasant climate, as in southern Italy; and the rainfall, which is moderate in winter, is so light in summer that irrigation is necessary for agriculture. The surface is so rough and rocky that large sections are unfit for farming.

FIG. 320.

St. Sophia, a beautiful church in Constantinople, now used as a Mohammedan mosque. This illustrates the Byzantine style of architecture—Byzantium having been the early name of Constantinople.

It was in this small peninsula, under what to our eyes appear to be very unfavorable conditions, that the marvellous civilization of ancient *Hellas*, or Greece, was developed. But these conditions really had the tendency to develop strong intellectual powers and brave men. The sea and mountains protected the races from invasion, and the many fine harbors and inlets permitted constant intercourse by water. By the commerce which thus arose the Greeks became so acquainted with the sea that they were almost as much at home upon it as upon the land.

In all parts of the world it has been under such conditions as these that strong races have been developed. It was true in Scandinavia, in the British Isles, and in the Spanish and Italian peninsulas. It is also true in the Japanese Islands, the home of the most highly developed Asiatics.

Because of their ability to navigate the inland seas, the European Greeks, in very early times, carried on constant communication with the people from whom they had separated, and who still dwelt opposite them, on the coast of Asia. The arts and customs of their mother country they improved upon, and in time became the greatest power in the then known world. They developed an art and a civilization which, with all our advancement, we have not been able to excel. They also became explorers, and cruised about the entire shores of the Mediterranean at a time when most of Europe was occupied by savages or barbarians. They entered into trade relations with their neighbors, taught them Greek arts, and established many colonies. Greek arts and literature, we should note, decayed with the loss of freedom in the Greek cities, which were conquered by barbarians from the north.

Through colonies in the Italian peninsula, and also through the immigration of individual Greeks, this people exerted a strong influence upon the Romans. Rome finally conquered Greece, although much of Roman civilization, and therefore the civilization of Europe, was due to Greek thought. After the decline of the Roman Empire other northern peoples devastated Greece, and finally the Turks entered and carried ruin to this as to other parts of the Balkan peninsula. Greece is now independent and is a limited monarchy.

FIG. 321.
A Greek peasant costume.

In this little country there are few natural resources. There is no coal, and therefore little manufacturing. There is some mining, as of lead and zinc; but the principal occupations are herding and agriculture. Large numbers of sheep and goats are raised; and the chief farm products are grain, tobacco, olives, and fruits. Among the latter is the small variety of grape known as the currant. These, together with raisin grapes, are cultivated in large quantities on the steep hillsides, and, after being gathered, are dried in the warm, dry, summer air.

The neighborhood of the sea has led the Greeks to continue their seafaring life, and they still carry on an extensive foreign trade. Many are also engaged in fisheries, and in securing bath sponges from the shallow sea-bottom among the Greek islands.

ATHENS, the capital and most important city, with about one hundred thousand inhabitants, is situated inland six miles from

FIG. 322.
A view of the Acropolis at Athens. The city lies back of the hill.

its port, PIRÆUS. The principal streets of the present city are quite modern, but ruins of the ancient Athens are still numerous. The most noted buildings, and some of the finest temples of ancient Greece, stood upon the Acropolis (Fig. 322), a level-topped rocky hill with precipitous sides. This remarkable stronghold was the natural centre for settlements in the surrounding plain.

Islands near Greece. — The many islands in the neighborhood of Greece are either mountain crests or else volcanic cones. Occasionally we hear of an earthquake shock in this island region or *archipelago*, showing that the mountains are still growing. The largest island near Greece, and the last to be separated from Turkey (1898), is *Crete* (Fig. 236), which, like the smaller islands, is under the control of the Grecian government and inhabited mainly by Greeks. The inhabitants are engaged in industries that are the same as in Greece itself.

REVIEW QUESTIONS. — (1) Describe the physiography of the Balkan peninsula. (2) Tell about the climate. (3) State some of the main facts in its history. (4) Name the countries of the peninsula. (5) What can you say about Montenegro? (6) Tell about Servia. (7) In what respects do Bulgaria and Roumania resemble each other? (8) Mention some differences. (9) Locate the capitals. (10) Tell about Turkey in Europe: character of the people; government; resources; manufacturing. (11) What special reasons are there for a large city at Constantinople? (12) Describe Greece: its physiography; climate; reasons for former importance; influence; reasons for decline; present condition; resources. (13) Tell about Athens. (14) What can you tell about the islands near Greece?

SUGGESTIONS. — (1) What reasons can you suggest for the fact that these eastern countries are in a constant state of unrest? (2) Turkey is occasionally referred to as the "sick man of Europe." Why? (3) How was Greece well situated for the trade of the ancient world? (4) Learn some facts about Homer, Plato, and other noted Greeks. (5) Read some of the ancient Greek myths. (6) Read about the defence of the Pass of Thermopylæ. (7) What reasons can you suggest for the fact that ancient Greece was divided into several independent states, but lacking a federal union? (8) Find out what you can about the revival of the Olympic Games at Athens.


TROPIC OF CANCER
RELIEF MAP
OF
EURASIA
EDWIN E HOWELL
SCALES

Reli

Fig. 323.

Relief Map of Eurasia.

PART V

ASIA, AFRICA, AUSTRALIA AND ISLAND GROUPS

I. ASIA

Size and Position. — Asia, the largest of the continents, includes almost one-third of the land of the globe. Its immense size is shown by the fact that it reaches from near the equator to a point halfway between the Arctic Circle and the North Pole. How many degrees is that? How many miles? It is six thousand miles from the Mediterranean Sea to Bering Straits; and so many degrees of longitude are included in Asia that, according to our plan for standard time, one would need to change his watch ten different times in going from one extreme to the other. How many changes are necessary in crossing Canada?

This great land mass, which reaches to within fifty miles of North America, is united to Africa by the Isthmus of Suez, while for a long distance the two continents are separated only by the narrow Red Sea. What is its connection with Europe? Why are the two often called Eurasia? (p. 269.) In what zones does Asia lie? Is the same true of any other continent?

Physiography and Climate (Fig. 323). — Asia resembles Europe in the irregularity of its mountains. While many of them extend east and west, there are others running nearly north and south. Name some of each. The islands and peninsulas are due to uplift of the earth's crust, while the seas which they enclose occupy depressions between the uplifted parts. Since the mountain growth has not entirely ceased, many of the islands are still slowly rising; and, as the rocks move and break, earthquake shocks are common, some of them being terribly destructive. There are also many volcanoes;

in fact, the islands off eastern and southeastern Asia form the most active volcanic and earthquake region in the world.

Although northern and western Asia is a vast plain, so much of the continent is mountainous that more than one-twelfth of the surface has an elevation above 10,000 feet. Here are found the Himalayas (meaning abode of snow), of which the loftiest peak, Mt. Everest (29,000 feet), is the highest in the world. Locate it. And here, too, are other ranges with peaks rising above valleys themselves 11,000 feet above sea level, or higher than most mountains. Between the mountains are tablelands, like that of Tibet, the elevation of which is from 10,000 to 15,000 feet, or in places as high as the loftiest peaks of the Alps.

Much of central Asia is so arid that some of the rivers from the mountains end in the desert sands, which are often heaped by the wind into low hills or dunes. But from the margin of the great central highland large rivers flow north, south, and east to the sea. On an outline map of

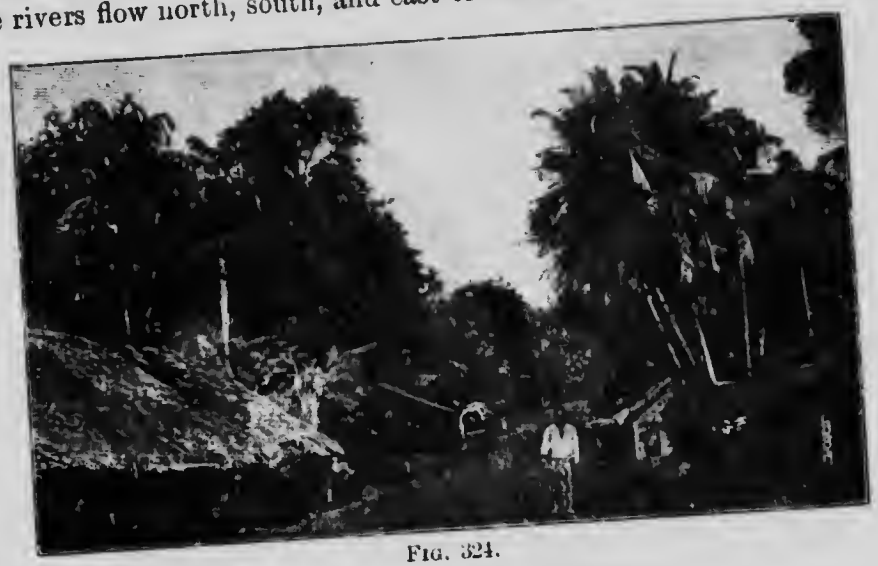


Fig. 324.

A tropical scene in a village in Ceylon.

Asia draw heavy lines to show the chief mountain chains, and then add the larger rivers with their names. Fed by the rains, snows, and melting glaciers of the mountains, these streams have a great volume of water and bear immense quantities of sediment, which they spread out over their broad flood plains or build into deltas in the sea. In the east and south these fertile, river-made plains are valuable for agriculture, and are the seats of the densest populations in the whole world.

Many of the rivers are deep and navigable; yet some of the largest lose much of their value for transportation because they flow northward over the cold plains of Siberia. This reminds us of our own northern rivers, which also flow into the Arctic, and are therefore frozen during a large part of the year.

In so vast a land, with such differences in elevation, there are, naturally, many different climates. Tropical heat is found in southern Asia, with dense forests in the belt of calms (Fig. 324) and in those places where ocean winds blow over the land; but where winds from the ocean cannot come, there are broad deserts. Upon the mountain slopes and in the more northern latitudes, the climate is either temperate or frigid, as in North America and Europe.

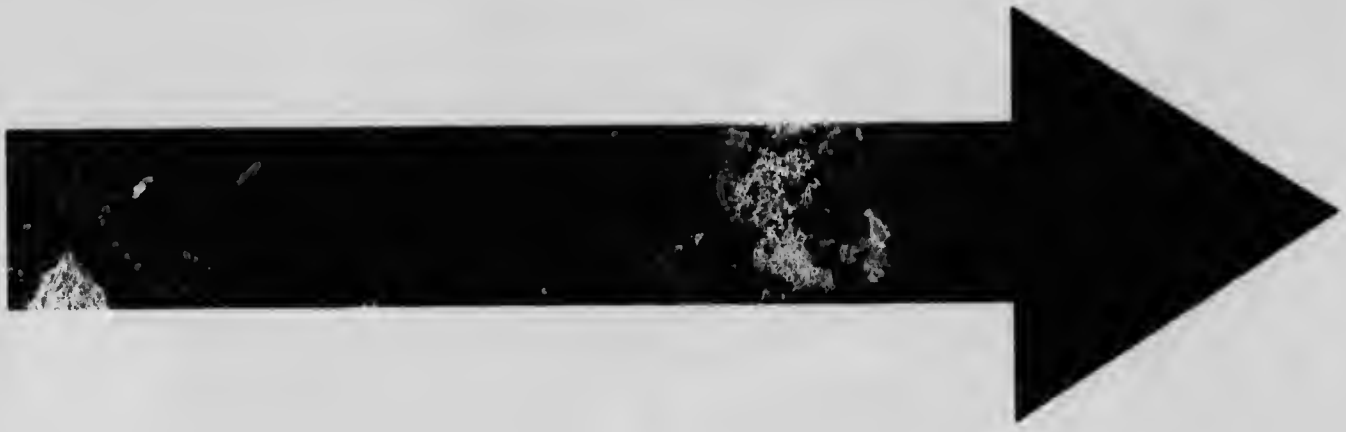
For example, the climate about Peking resembles that of southern Ontario; and the plains of central Siberia resemble in climate the plains of Manitoba and Saskatchewan, and produce the same crops. Such a climate, with warm summers and very cold winters, is called *continental;* and since Asia is the largest continent, the continental climate is best developed there. Thus where the Arctic Circle crosses the Lena River, the average temperature is 60° in July and 60° below zero in January, a range of 120° between summer and winter. This is the lowest winter temperature known in the world, and this point is therefore called the *cold pole* of the earth.

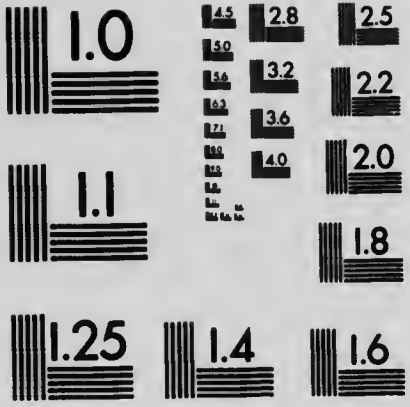
Plants and Animals. — The cold northern part of Siberia, like northern Europe and America, is a vast expanse of frozen ground, called tundra. Toward the south the tundra grades into the forest, low, stunted trees being followed by true forests of evergreens, birches, poplars, etc. Farther south, where the rainfall is light and the evaporation rapid because of the higher temperature, the soil is so dry in summer that the forests disappear. These steppes are covered with luxuriant grass in the north, but farther south they grade into the desert. Since northern Asia is really a continuation of Europe, the wild plants and animals, as well as the farm products, resemble those of Europe.

FIG. 325.

The banyan, or Indian fig tree, from whose lower branches shoots descend and take root — common in Ceylon and other parts of southern Asia.

In southern Asia, on the other hand, from Arabia to China, the plants and animals resemble those of Africa rather than those of Europe and northern Asia. One reason for this is that southern





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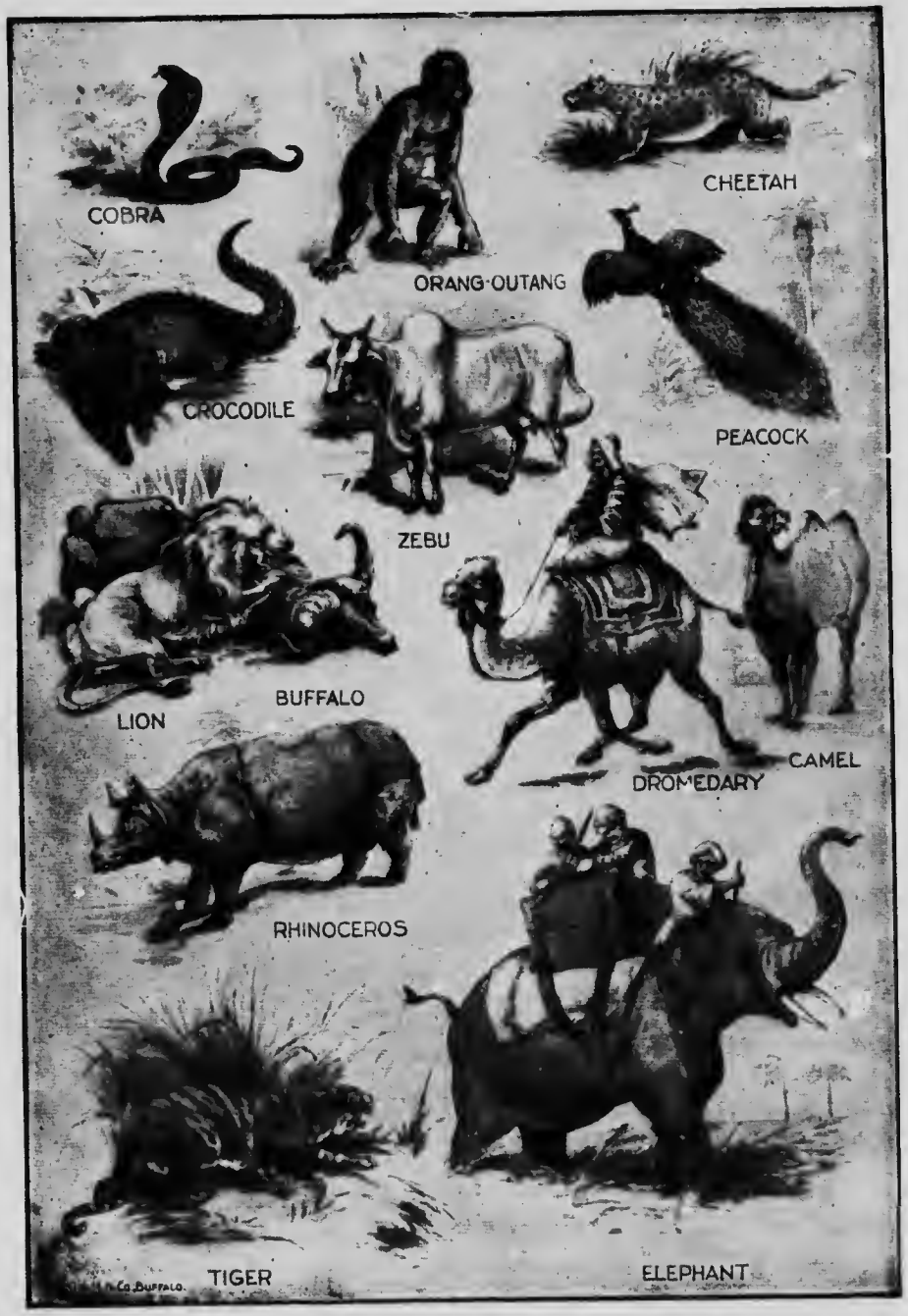

FIG. 326.

Some of the animals of Asia.

Asia has a tropical climate like Africa; another is that a mountain and desert barrier separates northern from southern Asia. Trace this barrier on Figure 323. As in Africa, the arid portion, including Arabia, Persia, and central Asia, is the home of the camel (Fig. 326) and ostrich (Fig. 357), while the elephant and rhinoceros (Fig. 326) live on the savannas and in the tropical jungles. Southern Asia is also the home of the fierce tiger and numerous species of monkeys and apes.

The extent to which the Asiatic people have employed animals in their service is indicated by the following facts. On the frozen tundras, where none of the other large domesticated animals thrive, the reindeer not only supplies milk, meat, and hides, but is also used as a work animal. The camel, whose original home seems to have been Asia, makes human habitation possible in the desert (Figs. 326 and 333). Elephants are domesticated and made to work in the dense tropical forest (Figs. 327 and 341); and the buffalo is used as a work animal in hot, damp lands where horses find the climate trying. Among the lofty plateaus and mountains, where the air is so rarefied and the slopes so steep that other work animals cannot be used, the yak is domesticated. Upon the steppes, where herds of cattle, sheep, and goats are kept, the horse is so necessary to the herder that the men almost live in the saddle. Indeed, the word *Cossack*, applied to Russians who dwell on the steppes, means horseman.

FIG. 327.
An elephant in Ceylon drawing a cart loaded with cocoanuts.

People. — Early progress toward civilization was made possible in Asia largely because certain portions were so favorably situated. The flood plains of the Euphrates and of the Indian and Chinese rivers had a fertile soil and an abundance of water for irrigation. They were, moreover, protected from invasion by ocean, desert, and mountain barriers, and the inhabitants could therefore cultivate the arts of peace. Among the shut-in valleys of the lofty mountains, also, were centres where development was possible because so protected from wandering hordes.

Asiatic peoples, moving into Europe, carried the civilization of their old home with them, and in time advanced much beyond those whom they left behind. In fact, while Europeans have been progressing the Asiatics have been standing still, or even falling back.

It would be difficult to give all the reasons for this last fact, but there are three that are prominent. One is the very isolation which made the first development possible; for the people were so cut off and separated geographically that they failed to learn from others, as those Europeans who dwelt along the Mediterranean were able to do. A second reason is that many Asiatics, like, for example, the Chinese, have felt that their civilization was the best, and have therefore refused to learn. A third reason is found in the wonderful development of navigation by Europeans, who have thereby learned many useful lessons from all parts of the world, acquired wealth, and founded distant colonies. The sea, formerly a protection to many Asiatic peoples, has, in recent times, even been used as a highway of attack upon them.

Fig. 328.
Japanese rain coats.

Where European civilization has been adopted, as in Japan and parts of India, rapid progress has followed. This indicates the possibilities of these people.

More than half of the human race live in Asia, two-thirds of them belonging to the yellow division, while the remainder are mainly whites. But although there are more than eight hundred million human beings there, most of the continent is sparsely settled. The mountain slopes, the cold plateaus, the steppes, deserts, forests, and tundras support but few inhabitants. Nearly seven-eighths of the people of Asia dwell near the coast, especially on the river flood plains and deltas of the southern and eastern part of the country. There almost every foot of available land is cultivated, and soil is even transferred to boats on the rivers.

Turkish or Ottoman Empire. — While Constantinople, the capital of the Turkish Empire, is in Europe, Turkey has ten times as much land in Asia as in Europe.

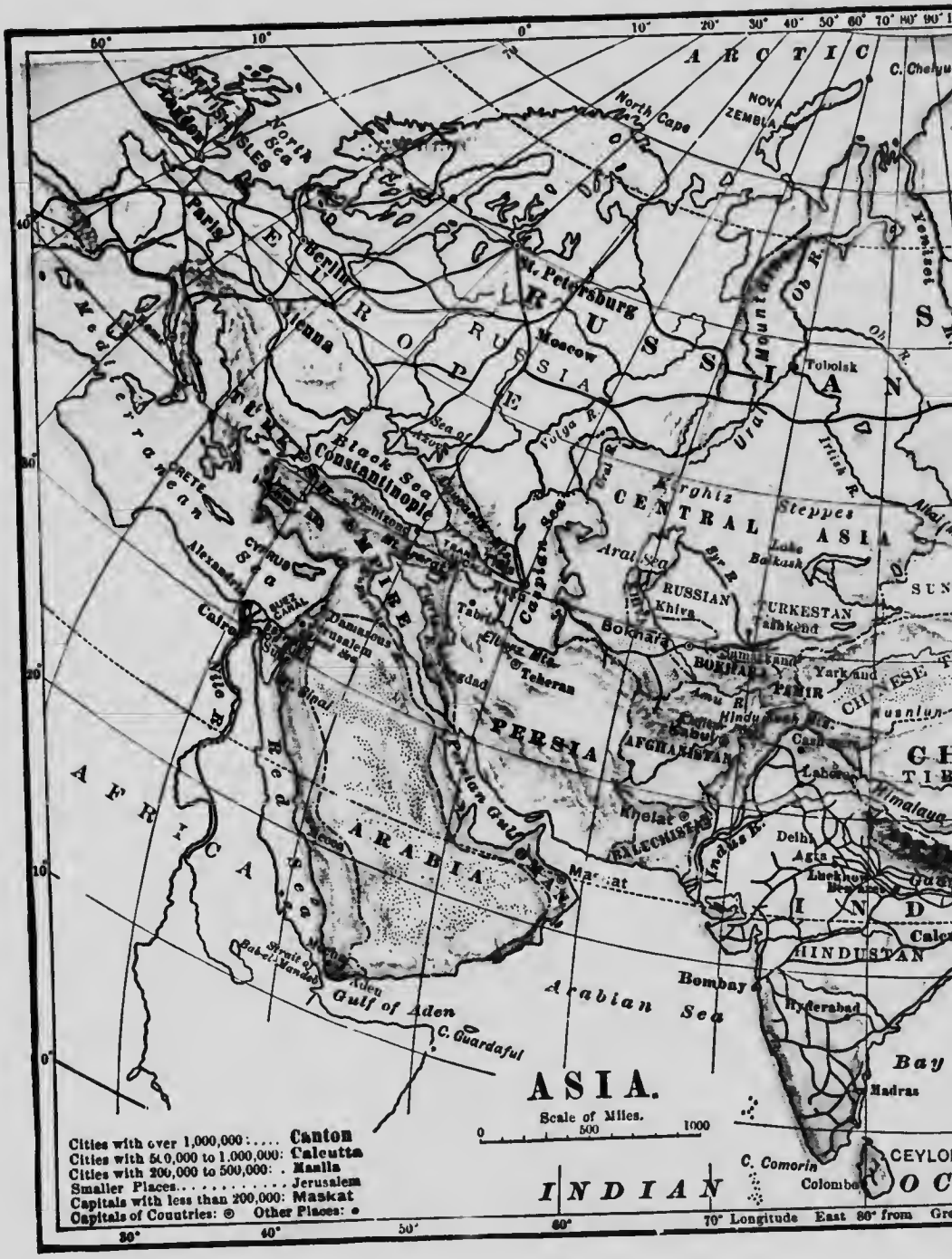

FIG.

MAP QUESTIONS.—(1) Compare the greatest length and breadth of Asia with that of North America. (2) Compare its area with that of other continents. (3) Where are the mountains? The plains? The rivers? (4) Draw a map of Asia, filling in the countries and marking their capitals. (5) Find four large inland seas and lakes. Which of these have no outlets? (6) Find the area of China, India, and Siberia. About how

Fig. 329.

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many times as large as Manitoba is each? (7) What facts about the climate can you infer from the map? (8) Trace the lines of railway. Compare Asia with North America and Europe in this respect. (9) Name some of the large islands near Asia. (10) Point out the most important cities.

Conditions in the Empire. — Turkey in Asia, although of little importance among nations at the present time, is of peculiar interest to us because of its historical associations. It is within its territory that many of the places mentioned in the Bible are located; here also Christ was born, as well as the prophet Mohammed; and it was from this centre that much of the ancient civilization spread along the shores of the Mediterranean.

Much of Turkey in Asia is tableland, with short mountain ranges and extinct volcanoes, of which Mt. Ararat is an example. Except along the coast of the Mediterranean and Black seas, where the wind brings vapor, there is little rainfall. The streams are usually short and shallow, and there are numerous salt lakes. Point out the two principal rivers (Fig. 32[illegible]).

Some of the mountains are forested, but elsewhere the country is open, and in places adapted to herding and agriculture. In the valleys, wheat, grapes, [illegible], figs, oranges, and cotton are raised, usually by the aid of irrigation. SMYRNA is the most important seaport. Locate it. Find TREBIZOND.

The inhabitants, though so near Europe, have not advanced as Europeans have. The valuable minerals are scarcely worked at all; herding and farming are carried on in much the same way as in the time of Christ; and there is practically no manufacturing except that done by hand. Some of this work, however, is very beautiful, as, for example, the Turkish rugs already mentioned.

The unfortunate history of the region furnishes an explanation of its lack of development. Asia Minor, the peninsula between the Mediterranean and Black seas, was the pathway for the ancient caravan trade between Europe and Asia. While this brought prosperity, it also led to many invasions. More than five centuries before Christ the country was conquered by the Persians; two centuries later it came under the control of the Greeks; and later still it became a part of the Roman Empire. After that, with the decline of the Roman Empire, came invasions by wandering Turks, Tartars, and others. It was by this route that the Mohammedan Turks gained a foothold in southwestern Europe, and by their occupation devastated the country. Notwithstanding Mohammedan persecution, many of the inhabitants still profess the Christian religion, although at great cost, as is proved by the terrible massacres that have occurred from time to time among the Armenians.

There are two parts of Turkey in Asia that merit special mention; namely, the *Holy Land*, and the valley of the Euphrates and Tigris rivers, or *Mesopotamia*.

The Holy Land. — This small part of Turkey in Asia possesses peculiar interest for us. Back of a straight coast, with no good harbors, lies a narrow coastal plain, beyond which are two low mountain ranges including between them the remarkable depression in which the Dead Sea is situated. While Hebron is about three thousand feet above sea level, the surface of the Dead Sea, a few miles to the east, is almost thirteen hundred feet below sea level, being the deepest depression on the lands of the world. Although fed by the river Jordan, which flows out of a fresh-water lake, the Sea of Galilee, the water of the Dead Sea is so dense from the salt it contains that a person cannot sink in it. The fact that it is salt shows that the climate is arid, for otherwise the depression would be filled with water, and, by overflowing, the sea would soon become freshened. The Jordan Valley lies no farther south than the southern part of the United States; yet since it is so low and enclosed, its climate is almost tropical.

Before the coming of the Jews this region was divided into small countries, often under the rule of their more advanced and powerful neighbors, the Egyptians. Then the Jews entered this "promised land" and created a kingdom which attained its greatest power under Solomon. It was here that many of the events in the Old Testament occurred, including the advance in religion from the belief in many gods to the acceptance of one all-powerful God. Persians, Egyptians, and Romans later ruled over Palestine, and it was during the control of the latter people that Christ was born at Bethlehem. What events in the life of Christ can you mention that occurred at some of the places referred to in this section?

FIG. 330.

A part of Bethlehem.

At that time, as we learn from the Bible, the region was highly developed. Wheat was raised upon the uplands, and olives, figs, and grapes in the valleys, while herds of sheep roamed over the plateaus and mountains. Recall events from the Bible that indicate these occupations. Palestine lay on the great caravan route which, leading from Egypt to the distant East, ran northward as far as DAMASCUS (Fig. 329) in order to avoid the Syrian desert. Throngs of people, therefore, passed this way.

Jerusalem (Fig. 331), the capital, was a great city, situated upon a lofty elevation that made it an important stronghold.

The city is now visited by many Christians, and also by Mohammedan pilgrims who believe that Mohammed ascended to heaven there. Very little of importance is to be seen, for much of the country, once "flowing with milk and honey," is in ruins. Even the usual mode of travel is by mule or by camel, as in olden times, although a short railway climbs the mountains from the seacoast, at JOPPA, to JERUSALEM, and another has been begun, following the old caravan route through NAZARETH, past the Sea of Galilee, to DAMASCUS. Trace these two lines. What is the length of Palestine? The breadth?

FIG. 331.

A view in Jerusalem.

Mesopotamia. — This region, including the fertile valleys of the Tigris and Euphrates rivers, has suffered the same fate as the rest of Turkey in Asia. Formerly a country of great resources, crossed by a network of irrigation canals, "a garden of the Lord," it has been devastated by the Arabs and Turks until it is now almost a waste. Babylon and Nineveh, once the seats of a wonderful civilization, are now marked only by mounds of ruins. From these ruins records are at present being unearthed which promise to throw much light upon ancient history.

Under such conditions there can be little commerce, though the Tigris is navigable with steamboats as far up as BAGDAD. This city, situated on the caravan route to the east, was of much importance in ancient times. There is still some trade between Europe and India along this route.

Arabia. — This peninsula is a plateau several thousand feet in elevation, with a fringe of mountains (Fig. 332), most prominent in the south and west. What waters border Arabia? Since the coast line is wonderfully regular, there are few harbors and therefore few coastal cities. Nevertheless, the enclosed seas favored the early development of navigation here as in the Mediterranean. Therefore in very early times Arabian ships carried on commerce with Africa, India, and even with eastern Asia.

The climate is hot along the coast, but cool on the plateau and among the mountains. A great part of the interior is desert, and almost everywhere the rainfall is light. What is the reason? What about large rivers? Coffee is raised in the southwest, near Mocha; the date palm flourishes in many places; and fruits and vegetables are produced in many of the valleys.

FIG. 332.

A view among the Arabian mountains.

In so unfavorable a climate the population is necessarily sparse and largely nomadic. Cattle, sheep, goats, horses, donkeys, and dromedaries are raised in large numbers, the three last being celebrated for their excellent qualities.

Most of the Arabian peninsula is independent, though without a well-organized government. Turkey controls the west coast and the Persian Gulf coast as far as *Oman*. Oman, whose capital is the seaport of MASKAT, was formerly an important kingdom; it still has extensive pearl fisheries. Great Britain has a foothold on the southwestern coast at ADEN, one of the most important coaling stations for the war-ships.

MECCA, a Turkish city about fifty miles from the sea, is sacred to all Mohammedans. It was here that Mohammed was born, and every Mohammedan is supposed to make a pilgrimage to it at least once during his lifetime. Most of these pilgrims come by sea, and every year the city, as well as the roads leading to it, are crowded with them.

Persia. — Like Arabia, Persia is an elevated tableland with large tracts of desert and salt steppes of little or no use to man. The arid climate prevents the formation of large rivers; but the rains

and snows of the parallel mountain ranges permit some irrigation in the broad valleys. There is so little rainfall, however, and evaporation is so rapid during the hot, dry summer, that water for irrigation is often led from the mountains in underground tunnels. Why are tunnels preferable to ditches?

The main farm products are tobacco, wheat, barley, cotton, and opium. Much silk is also produced, and roses are cultivated for the manufacture of attar of roses. The principal agricultural portion is near the Caspian Sea, where there is sufficient rainfall for crops and also for extensive forests on the mountain slopes.

FIG. 333.

A drove of camels in Persia.

Among the mineral deposits is the precious stone turquoise; but although there are doubtless other valuable minerals, there is little mining. Along the coast of both Arabia and Persia precious pearls and pearl shells are found.

Nearly two million Persians belong to nomadic tribes (Figs. 333 and 334) which roam about the desert, dwelling in tents, and herding goats, sheep, and other animals. There is no extensive manufacturing, but the Persians, like the Turks, do some very beautiful hand weaving, as, for example, shawls and rugs. Their carving and inlaid metal and wood work are also wonderfully artistic.

The government of Persia resembles that of Turkey, and is therefore very bad. The ruler, or *Shah*, an absolute monarch, controls the lives and property of his subjects, who are mostly Mohammedans. TEHERAN, the capital, has some beautiful mosques, though the dwelling-houses are made of sun-dried bricks and face narrow, filthy streets.

Afghanistan. — This country, "one of the waste places of the world," is a region of sand, bare rocks, and snow-capped mountains. Only in the valleys is the soil made to yield a harvest; and even there the cold, blustering winters and the dry, scorching summers make one of the worst of climates. Life under such unfavorable conditions has developed a people noted for hardiness, stubbornness, bravery, and cruelty.

As in other Asiatic countries so far studied, the government is very bad. The ruler, the merciless *Amir*, holds his authority by means of the terror which he inspires. His seat of government is at KABUL, nestled among lofty mountains. Since Great Britain has pushed her Indian frontier northward, while Russia has encroached on the opposite side of Afghanistan, this country is often called the "buffer state" between the two rival powers.

FIG. 334.

A Persian nomad girl.

Russia in Asia. — This vast section of the Russian Empire includes about one-eighth of the land surface of the globe. There are several divisions, such as Turkestan and the dependencies of Bokhara and Khiva; but by far the largest is Siberia, which is a million square miles larger than Europe, and even larger than Canada, Mexico, and Central America combined. Its population is at present about four times that of Canada. It is cold, bleak tundra in the north, and arid steppe in the south, while in the east are lofty plateaus and mountains. But in the central part is a broad belt of agricultural country, and much forest-covered land.

In the past Siberia has attained a reputation mainly as a source of minerals, and as a place of exile for Russians whom the government wishes to dispose of for political or other reasons. Gold has been found in a number of places, as in the Urals and near Lake Baikal, the largest fresh-water lake on the continent. But while

there is much mineral wealth in Siberia, there has been little mining, except in the western part near Russia.

A new era seems about to open for this vast empire, for the Russian government is now constructing extensive railways which will open up the country for development. One system extends eastward from the Caspian Sea to Turkestan (Fig. 329), while another and longer one reaches from Russia in Europe to the Pacific Ocean. Trace it on Figure 329. Hitherto transportation across the vast plains, arid steppes, and rugged eastern mountains has been difficult in the extreme.

Heretofore the products of Siberia could not easily be exported; nor could machinery and other manufactured articles be brought in without the greatest difficulty. But by the building of railways we may expect a rapid development of Siberia, whose resources are far greater than the

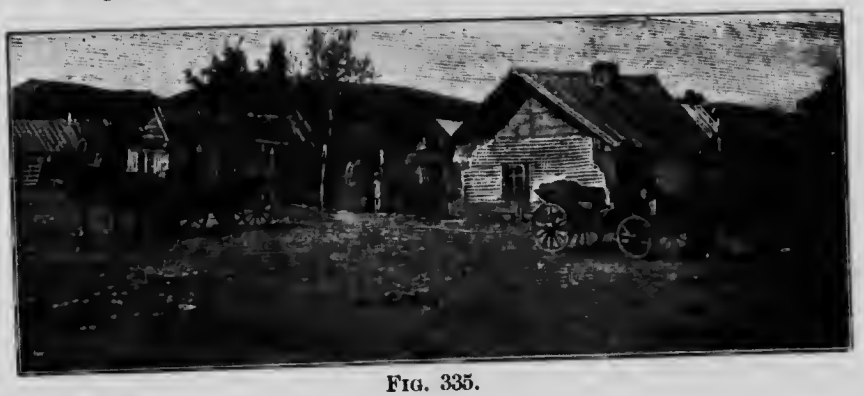


FIG. 335.
A village in Siberia.

scattered nature of the population would indicate. Indeed, since the longer railway was begun there has been a rapid increase in population and exports, especially of corn.

There are some important cities in Russia in Asia. The largest in the southwest is TASHKEND, which is about twice the size of Ottawa. TIFLIS, between the Black and Caspian seas, is really in Asia, though the Russian government classes this region with its European provinces. IRKUTSK, has a growing trade, while VLADIVOSTOK, the Pacific terminus of the Trans-Siberian Railway, is advancing rapidly. There are a number of other cities with a population of fifty to a hundred thousand.

India. — This densely populated peninsula, with its warm climate, offers a striking contrast to cold, sparsely populated, and slightly developed Siberia.

Physiography and Climate. — Lying largely in the torrid zone, the Indian peninsula has a hot climate. Its position in the trade-wind

belt might lead us to expect much desert, especially on the lee or western side. But this coast really has a heavy rainfall because it is reached by the summer monsoons (Fig. 31). In the winter, however, when the winds blow from the land, the climate is so dry that plants wither; and in Baluchistan, which is not affected by the summer monsoons, there is true desert. Southern India and Ceylon, on the other hand, have a heavy rainfall at all seasons. Why?

Fig. 336.
Natives of the Cashmere valley.

India, which is in the form of a triangle, has a remarkably regular coast and therefore few good harbors. Most of the peninsula is a plateau, rarely more than two thousand feet high, and largely covered with lava flows, the decay of which has produced a very fertile soil.

Fig. 337.
A tea plant.

North of the plateau is a broad lowland occupied by the Brahmaputra, Ganges, and Indus rivers, which, like the Po of Italy, have built the plains out of sediment brought from the mountains. Among the lofty mountains which lie to the north of the river plains, the highest are the Himalayas, in which there are scores of peaks that reach an altitude of over four miles. Even the mountain passes are from seventeen to nineteen thousand feet above sea level, or much higher than Mt. Blanc in the Alps.

Farming. — This mountain system forms a barrier to encroachments on the Indian Empire, just as in former times it protected the peninsula. With such protection the fertile plains and deltas

of the three great rivers became the seat of early civilization. From the very earliest times the people have been engaged in farming, and at present fully three-fifths of the population follow that occupation.

As there are 287,000,000 inhabitants in an area of about 1,559,000 square miles, it will be seen that there is an average of 184 persons for every square mile; and in parts of the country there are 500 per square mile. How many persons are there per square mile in Ontario? India is one of the most densely populated countries on the face of the globe? There are, in fact, almost as many people in India as in North America, South America, and Africa together.

FIG. 338.

A native village near Calcutta. Notice the bamboo on the right.

Millet, which grows on the drier lands, and rice, which is raised on the river lowlands where the land can be flooded, are the staple foods of the natives. After the dense population is fed, however, little is left for export. Wheat, on the other hand, is raised for export, and India is a vast granary for Great Britain. Much cotton is also produced. Some of this is manufactured into coarse fabrics for use at home and for export to China and Africa; but much is exported as raw cotton for use in the cotton mills of Great Britain. Other agricultural products are tea, sugar-cane, tobacco, opium obtained from a species of poppy, indigo of value as a dye, and jute grown upon the sandy river bars for the sake of its coarse, strong fibre.

For the production of rice, and for other crops as well, irrigation is necessary in many places. Therefore this country, favored with large rivers fed by the rains, snows, and melting glaciers of the mountains, has some of the most extensive irrigation works in the world.

Forests and Wild Animals. — There are valuable forests on the mountain slopes, where the trees, including pines, firs, and junipers, resemble those of Europe; and there are also magnolias and the beautiful deodar, a species of cedar. In the hotter portions are valuable medicinal plants and spices, such as pepper and cinnamon. The teak, with strong, durable wood, of great value in building, and the mango, the fruit of which is important as a food between harvests, are both common. Besides these, the bamboo and various palms are of great value. The bamboo is employed in hundreds of ways in making implements and building houses (Fig. 338); and the palms supply juices for drink, fibre for ropes and mats, and cocoanuts (Fig. 327) for food and oil.

In parts of the Ganges valley and elsewhere there are *jungles*, or tracts of waste land densely covered with bamboos, canes, etc., and very difficult to penetrate. From these wastes the lion has almost disappeared; but the elephant is still found, and there are various species of the monkey; also the rhinoceros, buffalo, leopard, wild boar, wolf, and Bengal tiger (Fig. 326). The tiger is much dreaded, for it not only preys upon cattle, but even attacks men. Among the Himalayas, goats, sheep, asses, and dogs still exist in a wild state. Crocodiles live in the rivers; and venomous serpents are said to kill as many as twenty thousand persons each year.

Mining and Manufacturing. — In addition to the raw products of farms and forests there are valuable minerals, including salt, petroleum, coal, and iron. India has long been noted for hand-made goods of great beauty; but with the exception of these there is little manufacturing. Of late, however, there has been a marked development of cotton manufacturing by machinery.

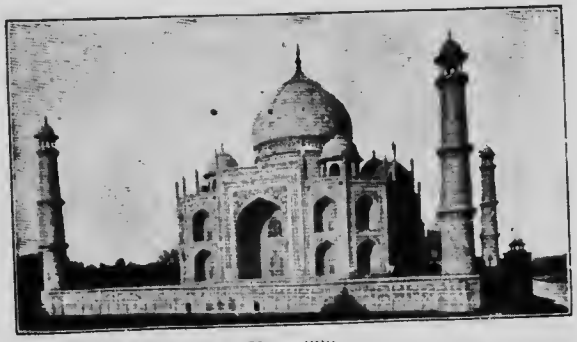


Fig. 339.
A tomb and mosque in India.

Famines and Plagues. — Although these people are so extensively engaged in agriculture, there are times when they do not raise enough food for their own use, and then terrible famines result. These occur when rain fails; and it may be that one section suffers while another has an abundance. With the building of railways the danger of famines decreases, for then different sections are brought more closely together.

The first railway was begun in 1854, and there is now a network across the peninsula (Fig. 329).

But even the railways do not entirely remove the danger; and probably famines will not cease so long as such vast numbers depend entirely upon the products of the soil.

India has also been visited by plagues which have destroyed tens of thousands of lives. With a population so dense, in a climate so hot, disease spreads with rapidity and with terrible effect, particularly among people who are not properly nourished.

Fig. 340.

The Great Pagoda in India — a sacred temple.

The people have many religious superstitions. For example, the Ganges, doubtless because of its great value for irrigating and fertilizing the soil, is considered a sacred river (Fig. 343); and bathing in its waters is supposed to wash away disease, though, since the waters are also used for drinking, this custom is no doubt responsible for the spread of much disease. The conscientious Hindu makes at least one pilgrimage to the holy river as a means of gaining divine favor and forgiveness.

Government. — Over three hundred years ago a company of London merchants obtained a foothold in India for trading purposes. The peninsula was then divided among many native rulers, and at various times the British government was called upon to settle disputes between them. Partly in this way, and partly through the occasion of intervening for the protection of British subjects engaged in the Indian trade, Great Britain gradually gained control of the peninsula. India was formally taken over by Great Britain in 1858, and in 1876 the Indian Empire was established as a part of the British Empire. The king of Great Britain is also Emperor of India.

By their protection and direction, the British are able to maintain their hold upon this vast country, the population of which is more than seven times that of the British Isles. Throughout India there is an average of but one British resident to every three thousand natives, and by far the greater number of government officials are Hindus. One of the members of the Imperial government is Secretary of State for India; and a governor-general, called the *Viceroy*, is sent from Great Britain as chief executive officer. The government has not attempted to overturn the numerous native states; nor has it interfered seriously with the firmly established customs of the people, except to put down barbarity.

Baluchistan and Burma. — The Indian Empire is not confined to the Indian peninsula. It includes also the desert country of Baluchistan to

FIG. 341.

Elephants at work in a lumber yard in Burma.

the west, and fertile Burma to the east. In the latter country there are great numbers of Mongolians. Vast quantities of rice are raised, and there are other valuable products, as rubies, sapphires, and tropical woods. In Burma the elephant is used for moving logs (Fig. 341), drawing ploughs, and carrying passengers. RANGOON, the seaport, is noted for its export of rice; but MANDALAY, farther up the Irawadi River, is the largest city in Burma.

Base of Himalayas. — Between Burma and the peninsula of India, at the base of the Himalaya Mountains, is the region which has the heaviest rainfall in the world. Much tea is raised on the hills of that section (Figs. 337 and 342); for tea requires a hot climate, an abundance of rain, and sufficient slope to prevent the water from standing about the roots of the plant.

The tea plant, which is three or four feet high, has bright green leaves resembling those of a rose bush. The leaves are picked several times a year, often by boys and girls. After they are picked they are dried in the sun and later in buildings, in order to remove all moisture before packing.

Just north of this tea district, among the Himalayas, are *Nepal* and *Bhutan*, which, though small, retain their independence and are not interfered with by their neighbors.

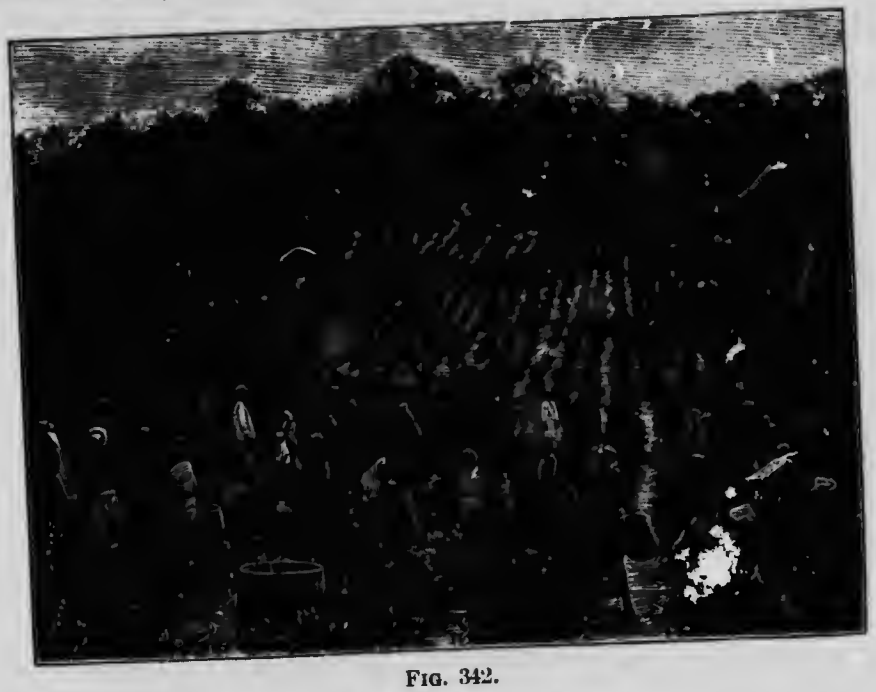


FIG. 342.
Picking tea in India.

Principal Cities. — So many Hindus are engaged in farming that only about five per cent of them dwell in large towns. Nevertheless, there are seventy-five cities with a population of over fifty thousand, while two, Calcutta and Bombay, have over eight hundred thousand each.

CALCUTTA, the largest city, is a seaport on the Ganges delta and the natural outlet of the fertile Ganges valley; but it has a poor harbor on a river that varies in volume. It has some manufacturing, — being near coal fields, — but it is chiefly important as a commercial centre and as the residence of the Viceroy.

Farther up the Ganges are the smaller cities, LUCKNOW and BENARES. The latter, the "holy city of the Hindus," is on that part of the Ganges which is deemed most holy. At this point temples (Fig. 343) line the

banks of the river for miles, and a steady stream of pilgrims pours in and out of the city. Lucknow is celebrated for the long siege sustained by the British troops and loyal Sepoys during the Indian Mutiny.

There are no large cities on the Indus. This is not because the river is useless for irrigation, but because of shallow waters and sand bars which interfere with navigation. These are due to the fact that the river, though well supplied with water from the mountains, loses much of

FIG. 343.

Temples along the Ganges at Benares.

it by evaporation in crossing the arid plains. Thus it is obliged to deposit some of its sediment as sand bars in its channel.

BOMBAY, next in size to Calcutta and the nearest port to England, is a great business centre. It is, moreover, the only Indian city with a really good harbor. MADRAS, the third largest city, is situated at a point where there is only an open roadstead protected by a breakwater. DELHI, the ancient capital of India, was brought into special prominence during the Indian Mutiny, as it was there that the rebellious Sepoys made their most determined stand. CAWNPORE contains a beautiful memorial to the Europeans massacred there during the Mutiny.

Ceylon. — With a fertile soil, abundant rainfall, and high though equable temperature, Ceylon is a beautiful tropical garden, and was considered by the Arabs to be the Garden of Eden. Among the products of Ceylon are cocoanuts, rice, fruit, coffee, and tea. The island is the third most important tea-producing section in the world. Other products are sapphires and rubies from the stream gravels, and beautiful pearls and mother of pearl obtained from shellfish which live among the coral reefs.

Indo-China and the Malay Peninsula. — This peninsula consists of a series of mountain chains, spreading fan-shaped southward, with numerous long, narrow valleys between, which broaden toward the south and terminate in fertile, populous delta plains at the river mouths. In addition to Burma, a part of the Indian Empire, there are three divisions of this peninsula: (1) *Siam*, (2) *French Indo-China*, and (3) the *British Straits Settlements*.

Siam. — In this tropical country most of the inhabitants, who are either Chinese or Malays, live along the rivers and irrigation canals, where they are largely engaged in the production of rice. Millet, which is raised in the drier places, competes with rice in importance as a food. Among the mineral products are rubies, sapphires, gold, and tin. The forests yield tropical woods, especially teak wood, for use at home and for export.

Siam is a monarchy, the king being assisted by a council of ministers and a legislative body of noblemen. The poorer classes are still kept in a kind of serfdom by the local governors; that is, they may be compelled to labor for the governors for two or three months each year.

BANGKOK, the capital and largest city, is situated on the banks of a muddy river, up which vessels of small draught are able to pass to the city. Most of the inhabitants live either in poor houses on narrow ill-kept streets, or else in boats and floating houses on the river; but the king has magnificent palaces decorated with carved marble and frescoed with gold. Buddhism is the religion of the country; and in Bangkok alone there are said to be ten thousand Buddhist priests whose temples (Fig. 344), decorated with gold, silver, and jewels, are wonderfully gorgeous. Next to the king the white elephant is held in highest reverence, and Siam is often called "the Land of the White Elephant."

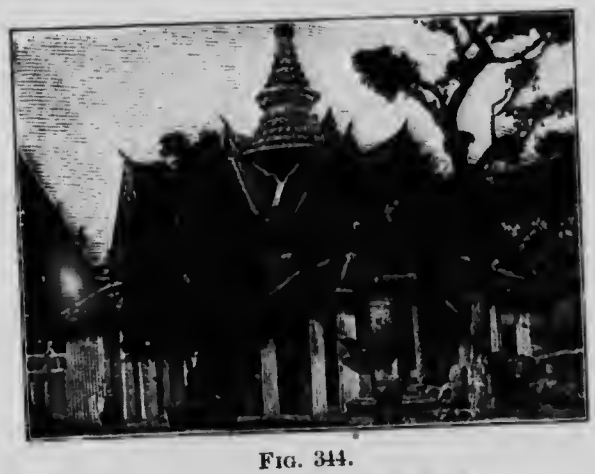


FIG. 344.
A Buddhist temple at Bangkok.

French Indo-China. — This dependency of France resembles Siam in climate and people. Its forest-covered hills yield valuable teak and iron wood, and in its valleys are extensive fields of rice and millet. Rice culture is here favored by the warm, damp climate and by the broad, easily flooded deltas and flood plains of the Mekong and other rivers. Silk,

cotton, tea, and spices are other products, and there are also extensive coal beds. Some coal is exported.

Straits Settlements. — This is the name given to the British possessions on the southern end of the Malay peninsula. In that hot, damp country, so near the equator, such tropical products as rice, cocoanuts, gutta-percha, and spices are obtained. Extensive deposits of tin are found in this region, which supplies about half the tin used in the world. The mining is done crudely by Chinese, while the native Malays are mainly engaged in farming and fishing. The only city of importance is SINGAPORE.

Chinese Empire. *Area and Population.* — This empire, which is nearly as large as Siberia, has more inhabitants than any other nation in the world. It includes nearly half the population of Asia; that is, about the same number as are found in North America, South America, Africa, Australia, the British Isles, and Germany together. Or, otherwise expressed, it has fully twenty-five million more people than live in all of Europe. The hordes of Chinese who live on the river flood plains and deltas of the south and east make this the most densely settled large area on the globe.

Nevertheless, there are outlying provinces of great extent, such as Mongolia, Turkestan, and Tibet, where the population is very sparse indeed. This is because of the rugged mountains and the vast desert plateaus where the dryness is unfavorable to all industries save herding. There are large sections, as in the great Desert of Gobi, where even this industry is impossible. Strangers find it difficult to enter some of these remote districts. The holy city of LASSA in Tibet was visited, before the British expedition of 1904, by only three Europeans. The inhabitants capture and often torture those whose curiosity leads them there. Over these wild regions the Chinese government is able to exert only a very slight authority.

FIG. 345.

A scene in the arid mountainous part of China, where camels are used.

Climate. — Most of the densely settled part of China has a temperate climate with an abundance of rain during the summer monsoon. In the north, for example near Peking, which is about the 40th parallel of latitude, the summers are warm and the winters cold; but

farther south, as at Canton, just south of the Tropic of Cancer, the climate is tropical, and there is rain throughout the year. Toward the interior the climate grows steadily drier, and, with increasing elevation, colder also.

The rains and snows of the Chinese mountains supply water for a number of large rivers. The two most important rivers are the Hoang-ho and the Yangtse-kiang, whose floods spread out over the broad deltas and flood plains, thus depositing sediment and adding fertility to the soil. The greatest rise, which in the Yangtse-kiang reaches a height of fully forty feet, occurs during the summer rains.

FIG. 346.
A part of the Great Wall of China.

It is with great difficulty that the Hoang-ho is controlled, and in the last twenty-five hundred years its lower course has changed eleven different times. In some cases this has caused a change of three hundred miles in the position of the river mouth. A single flood destroyed a million people. Because of the repeated destruction of life and property, the Hoang-ho has been called "China's Sorrow."

People and Civilization. — The Chinese Empire is inhabited by people of varied origin, with different customs, religions, and languages. The Mongolians, who form the basis of the population, apparently came from western Asia, bringing with them the knowl-

edge of irrigation. Although China is partially protected on the west by mountain ranges and desert, the constant danger of invasion by nomads led, as early as 212 B.C., to the construction of the Great Wall (Fig. 346) along the northern frontier.

This wall, twelve hundred miles long in a straight line, and fifteen hundred miles with all of its windings, passes up and down hill (Fig. 346) and even over a mountain peak. It is twenty-five feet wide and thirty feet high, and at short distances apart are strong watch-towers rising still higher. This wonderful structure, which required armies of men to build, was so well made that it is still perfect in many places.

Fig. 347.

A scene in a public court at Shanghai.

Long before Europeans had emerged from the state of barbarism, the Chinese had developed a remarkable civilization. The art of printing, the manufacture of gunpowder, the production of silk and silk goods, the baking of porcelain or china ware, and other important arts were known to them long before Europeans learned them.

But in spite of their early start, the Chinese have been outstripped by Europeans. Their peculiar customs in part account for their failure to advance farther. They are followers of Confucius, and his doctrine is everywhere taught. In fact, no one can be appointed a government official who has not passed an examination in the Chinese classics, including the doctrine of Confucius.

One of their doctrines is ancestor worship, which leads them to regard new customs as bad. This tends to check development, and is one of the

reasons why they object to adopting European and American civilization. The strength of their ancestor worship is indicated by the fact that disobedience to parents is regarded in China as one of the worst of sins, for which children may be whipped to death. By law the punishment for striking a parent is death.

The conservatism of the Chinese is shown by their objection to the introduction of labor-saving machinery, and it is also shown by their methods of transportation. Much of the traffic is carried on by means of canals (Fig. 348), of which the largest is the Grand Canal (Fig. 329), built more than twelve hundred years ago. The rivers are also much used, even where transportation on them seems almost impossible; yet, instead of steam, they make use of poles, oars, and sails. Good roads are rare, and one of the principal vehicles is the wheelbarrow, even for carrying travellers. There are, for example, two thousand passenger wheelbarrows in SHANGHAI. Pack animals and men are used for carrying loads, and the more prosperous persons are carried in chairs by their servants. It is evident that a man's time in China is not valued very highly.

FIG. 348.
A typical Chinese village and canal.

National Resources. — Though many Chinese are engaged in fishing, both in the rivers and the ocean, they are in the main an agricultural people. Their farming methods are very crude; yet they are so careful and industrious, and labor is of so little value, that they till every bit of land possible. For example, water for irrigation, instead of being distributed only over moderate slopes, as in America, is often taken to the very tops of hills. It is first raised from the river by means of wheels, turned either by men or by buffaloes, and then pumped upward from one terrace to the next until the whole hillside has been watered.

The principal food of the Chinese is rice; but their main products for export are tea and silk. Tea is raised on the damp hill slopes of the south, where the conditions somewhat resemble those in India. Fully forty thousand men and women are employed in carrying tea into FUCHAU alone. They receive but ten cents a day for their labor. In the warm south, great quantities of silk

are obtained, as in France, from the cocoon of the silk-worm caterpillar. Some of the caterpillars feed on forest leaves, others are carefully fed on the mulberry leaf.

As in other countries of southern Asia, the bamboo is one of the most valuable products. The seeds are ground up for food, and in spring the tender roots and stalks are eaten. The roofs and walls of houses, as well as nearly all articles of furniture, are made of bamboo wood. It is, moreover, woven into mats, baskets, and hats, while paper is made from its pulp. There is almost no other kind of manufacturing, nor is there much development of the wonderful mineral resources. It is said that China contains the largest coal fields in the world, in which both bituminous and anthracite coal occur; and there are also deposits of gold, silver, lead, and iron ore.

FIG. 349.
A Chinese pagoda or temple.

Government. — The Chinese government is peculiar. The *Emperor*, who has a right to nominate his own successor, is known as the "Son of Heaven." He has under him a *Viceroy* for each province, who must collect money for the imperial government, but is partly independent of the Emperor. The present Emperor is not a Chinaman, but belongs to the Manchu division of the yellow race, which invaded and conquered China in 1644. It was then that the Manchu custom of wearing a long queue, or "pigtail," was introduced into China.

Principal Cities. — There are many cities in China, all densely crowded. The poorer classes live huddled together, while the wealthier classes and officials dwell in comfort and luxury. The largest city is CANTON, which is nearly as large as Paris. It is situated on a densely populated delta and is a port of outlet for productive southern China, being especially noted for its silk. It is said that three hundred thousand people, or one-eighth of the inhabitants, live in boats moored in the river.

HONGKONG (Fig. 350), an island which commands the approach to Canton, belongs to Great Britain. To Hongkong many of the

products of China are sent for export to Europe and America. It is therefore a very busy place. HANKAU and WUCHANG, on opposite sides of the Yangtse-kiang River, are important river ports for tea. As in the case of most Chinese cities, the number of inhabitants is uncertain. For example, by some estimates Hankau has a population of a million and a half, by others, only eight hundred thousand. The treaty port [1] of SHANGHAI is another large city; but TIENTSIN, the port nearest PEKING, and the northern terminus of the Grand Canal, is still larger, having a population of about a million. The strongly fortified harbor of PORT ARTHUR, formerly owned by Russia, is now in the possession of the Japanese. WEI-HAI-WEI, opposite Port Arthur, is under lease to Great Britain.

FIG. 350.
The harbor of Hongkong.

PEKING, the capital of China, is situated on a broad, sandy plain. It has been the capital of a kingdom for three thousand years and of the Chinese Empire for over eight centuries. This city, like others in China, is surrounded by a high wall with gates that are closed at night, as of old in Europe. It is a rectangular city, with one portion reserved for the gardens and palaces of the imperial government. This part is known as the "Forbidden City," because the Chinese government refused to permit foreigners to enter it.

Korea. — This mountainous peninsula has a temperate climate and is adapted to the production of such crops as grains in the north, and rice, tobacco, and cotton in the south. In many respects the inhabitants resemble the Chinese; in fact, Korea was a dependency of China until

[1] Foreigners are not allowed to trade in all Chinese cities, and those ports where this privilege is allowed by treaty are called "Treaty Ports."

freed by the war between China and Japan in 1894. While there are great natural resources, including both coal and iron, there has been little advance. The government is an absolute monarchy; the people have few rights; and, until 1882, the country was closed to foreigners. The capital is SEOUL. In 1905, as a result of the Russo-Japanese War, Japan established a protectorate over Korea.

Japan. — This island empire extends from Formosa to the Kurile Islands, and includes the southern half of Sakhalin Island. How many degrees is that? About how many miles? The location of the islands with reference to the mainland reminds us of the British Isles; and, in fact, Japan's isolation from other countries has secured to her the same freedom from invasion as has long proved of such advantage to Great Britain.

Physiography and Climate. — Notwithstanding the great length of the empire, its narrow islands occupy an area of little more than one-half that of Ontario. So much of this is mountainous that not more than one-sixth of the surface can be cultivated, and many of the lowlands are difficult to reach because of the rugged surface and the absence of navigable rivers. There are numerous volcanoes, that of Fujiyama being the most prominent; and, since the mountains are still growing, there are many earthquakes. These are so frequent and violent that in building houses the people must allow for their force.

Nipon, the main island of Japan, has a warm temperate climate and an abundance of rain. Other islands near by have a similar climate, but *Formosa* is partly within the tropics. Estimate its distance from Vancouver.

FIG. 351.
A Japanese peasant family travelling.

Under these conditions, in several respects so unfavorable, a dense population has developed, equal to about six times that of Canada. In most ways the Japanese are the most advanced people in Asia.

People and Government. — In early times Japan was invaded by Mongolians, who expelled the original inhabitants to the more barren northern islands. From these Mongolians are descended the present Japanese, a people noted for their smallness of stature and their wonderful artistic instinct, their personal courage, and their devotion to country.

Centuries before the time of Christ they had developed a civilization resembling that of their kinsmen, the Chinese. Their fine taste led to the manufacture of many beautiful articles of silk, metal, glass, and wood. Like the Chinese, they for a long time did not care for modern civilization, and closed their ports to the outside world. In 1853, however, under compulsion from the United States, the Japanese opened these ports to that country, and later, in 1868, to the commerce of the world. Since that time the progress of the Japanese has been little short of marvellous.

FIG. 352.
A Japanese travelling-chair.

One great drawback to the advance of Japan was the nature of the government, which resembled that of Europe in the Middle Ages. While the *Mikado* was nominally emperor, the real power was in the hands of noblemen who, by the feudal system, had large numbers of peasants, not only to work for them, but to fight when necessary.

FIG. 353.
A temple in Japan.

After the country was opened to foreigners the power of the noblemen was lessened, and the Mikado became the real emperor. At present he is aided by two legislative bodies, one consisting mainly of noblemen, the other elected by qualified voters. There is also a Cabinet appointed by the Mikado, the members of which are responsible to him for their actions.

Recent Advance. — Since these changes the Japanese have become noted for their willingness to learn the lessons of Western civilization, and their progress has been truly wonderful. New schools have been started, and education has been made compulsory. Americans and Europeans have been induced to go to Japan to teach, and Japanese students have been sent to Europe and America to study in the universities and military and naval schools, and to learn what they could of Western civilization and of the art of war. Many Japanese, sent by the government, visit Europe and America each year for the purpose of learning about the most advanced ideas in machinery and manufactures. Thus, in a generation the Japanese have added to their own knowledge that of Europe and America; and they have learned their lessons so well that, with their patience, skill, and intelligence, they alone of all the nations in Asia have taken rank with the great nations of the world.

FIG. 354.
Jinrikishas, or "man-power-carriages."

The progress that has been made is suggested by the following facts. Over seven hundred newspapers and periodicals are now published in Japan. While in 1872 there was only one short railway from Yokohama to Tokio, a distance of eighteen miles, there are now more than three thousand miles of railway in the empire. There are many large manufactories of various kinds; and, as in the British Isles, cotton and other raw products are imported for manufacture. There is a curious mixture of modern and ancient customs here (see Figs. 351–354).

The remarkable intelligence, energy, and determination displayed by the Japanese during their war with Russia in 1904–05 astonished and roused the admiration of the world. Their victories by land and sea have given them a place among the leading peoples and a voice in the affairs of nations. The country seems destined to play an important part in the world's history.

Resources. — Among the mountains there are valuable deposits of

gold, silver, copper, iron, and coal; and these are now well developed. The mountain sides are covered with forests of great value, including giant cedars, camphor laurels, and lacquer trees; and wherever the soil is favorable there is agriculture. Among the products of the farm are wheat, sugar-cane, and rice, the latter being the chief article of food, as among other Mongolians. As in China, both tea and silk are produced, and these form two of the main articles of export. Much of our tea comes from Japan. Besides these industries, fully two and a half millions of people are engaged in fishing.

Principal Cities. — TOKIO, a city about one-half the size of Paris, is the capital of Japan. Besides being the home of the Mikado, and therefore having many government buildings, it has numerous manufactories. YOKOHAMA, at the entrance to Tokio Bay, was a mere fishing village in 1853; but since the harbor of Tokio is unsuited for the large modern ships, Yokohama has grown rapidly and now has the largest foreign trade in Japan.

Other important cities, having a population of several hundred thousand, are OSAKA, noted for its cotton manufacturing; KIOTO, the former capital, and the centre of the tea district; and NAGOYA, a centre for porcelain manufacturing, for which Japan has long been noted. All these cities are connected by railway lines, which have been a great aid in the development of their industries. State how.

REVIEW QUESTIONS. — (1) Tell about the size of Asia; also its position with reference to the zones and other continents. (2) Tell about its physiography. (3) Describe the climate. (4) Tell about the plants and animals, showing the contrast between northern and southern Asia. (5) What about the use made of animals? (6) In what sections were the beginnings of civilization probably made? Why there? (7) Give reasons why Europeans have so outstripped the Asiatics. (8) Tell about the population of Asia and its distribution. (9) Why is Turkey in Asia of special interest to us? (10) Describe its surface, climate, and industries. (11) Why, and from what peoples, has Asia Minor suffered frequent invasions? (12) Tell about the Holy Land: its surface; climate; history: present condition. (13) Tell about Mesopotamia. (14) Describe the surface and climate of Arabia. (15) Tell about its government, products, and principal cities. (16) Give the main facts about Persia. (17) Do the same for Afghanistan. (18) Compare the area of Siberia with that of various countries of the world. (19) What about the resources and future of Siberia? (20) Tell about India: its climate and surface; population; agricultural products; forests and jungles; animals and plants; minerals; manufactures; famines and plagues. (21) How did the British gain control over India, and how is the control exercised? (22) Tell about Baluchistan and Burma. (23) For what are the countries at the base of the Himalayas important? (24) Locate and tell about the principal cities of India. (25) What can you tell about Ceylon? (26) Give the principal facts about Siam. (27) Do the same for French Indo-China; for Straits Settlements. (28) Tell about China: area; number of inhabitants and their distribution; climate and rivers; people

and their early civilization; reasons for their recent lack of development, giving examples; agricultural products; minerals and manufactures; government; principal cities. (29) What can you tell about Korea? (30) Tell about Japan: position; area; physiography and climate; population; people and government; recent advance; resources; chief cities.

SUGGESTIONS. — (1) What do you know about the massacres of Armenian Christians by the Turks? (2) Why, do you suppose, has Turkey not laid claim to all of Arabia? (3) Estimate the area of the Holy Land. (4) Make a sand or clay map of the Holy Land. (5) Point out on any map of the Holy Land some of the places often mentioned in the New Testament and describe some of the events that occurred there. (6) What Bible events have their scene in Mesopotamia? (7) Write a paper to show to what extent our present civilization is indebted to the Holy Land. (8) Find out some facts about the Crusades. (9) Find out the length of the railway across Siberia. (10) About how far is it by rail from Lisbon in Portugal to Port Arthur on the Pacific? (11) Read Kipling's Jungle Books. (12) Find out what you can about British rule in India. (13) Tell the story of the Indian Mutiny. (14) Find out about the British expedition into Tibet in 1904. (15) Why should the Great Wall of China have less value now than formerly? (16) How is Peking poorly situated for the capital of so vast an empire? (17) Find out about our laws for the exclusion of the Chinese, and the reasons why they were passed. (18) Describe some of the events connected with the siege of the legations and the relief expeditions sent to Peking in 1900. (19) Find some facts about typhoons. (20) What Asiatic countries have you seen represented among the immigrants to this country? (21) Examine pictures of buildings in Asia, to note how different are their styles of architecture from our own. (22) Write a paper telling in what respects you would expect to find an Asiatic city different from one of our own. (23) By what water routes could you go from Montreal to Tientsin? Would it be nearer to go by rail as far as Vancouver? (24) By what all-water routes could you go from Halifax to Bombay? Which is the shortest? (25) What interest has Canada in the progress of Japan? (26) Who was Omar Khayyám, and what did he write? (27) Find some facts about the conquest of parts of Asia by Alexander the Great. (28) Who first reached India by water? (29) Who was Marco Polo?

II. AFRICA

Physiography. — Africa, the second continent in size, resembles South America in outline. Its form is roughly that of a triangle, broad at the north and tapering toward the south. The coast line is remarkably regular, in striking contrast with the coast of Europe, Asia, and North America, and resembling that of South America and Australia. What must be some of the consequences of such regularity? What gulfs, seas, and large islands are found on the map of Africa?

Africa differs from all other continents in its mountain systems. It is mainly a plateau, but near the coast the plateau edges are broken and the rocks upturned, so that there is an almost complete mountain rim. Trace this rim (Fig. 355); from what part of the coast is it absent? In northern Africa the Atlas ranges reach an elevation of fourteen thousand feet; but the loftiest mountains are in the east central part. Among the latter is the volcanic cone of Kilimanjaro, the highest peak on the continent. Find this peak and trace the mountains from there northward. Notice the elevated land in Abyssinia.

Owing to the mountain rim the rivers of Africa are peculiar. For instance, the Niger, after rising among the highlands near the west coast, sweeps around in a great curve before entering the Atlantic. The Zambezi, in the south, also rises near the west coast, but crosses the continent eastward to the Indian Ocean. Trace the courses of the Nile and the Kongo, the two largest rivers.

In descending from the plateau each of these streams is interrupted by rapids and falls. Find the Victoria Falls of the Zambezi (Fig. 361); the cataracts of the Nile; also Leopoldville on the Kongo, below which are some falls. Rapids also occur in the Niger. How will these great rivers compare, therefore, with the St. Lawrence, Mississippi, or Amazon as routes for commerce? How must these falls affect the development of Africa? In one part of Africa there are several large lakes. Name the three largest. Into what rivers do they empty?

Climate. — The equator crosses so near the middle of Africa that only the northern and southern ends are in the temperate zones.

FIG. 355. — Relief map of Africa.

Therefore the climate of most of the continent, like that of South America, is tropical. Since the altitude of so much of Africa is so nearly uniform, the belts of climate extend nearly east and west. What is true in this respect of South America?

In equatorial Africa, that is for some distance both to the north and south of the equator, there is such a hot, rainy climate that, as in the Amazon valley, the land is densely covered with a tropical forest (Fig. 356). This is especially well illustrated at the base of the plateau, where the narrow strip of coast land is hot, reeking with moisture, and the seat of deadly malaria. These conditions have greatly interfered with exploration, for disease is apt to seize white men even while they are crossing the coastal strip.

FIG. 356.

To show the influence of climate on vegetation. In the savanna area there are numerous forest-covered sections, especially near the rivers.

The interior, owing to its greater elevation, is somewhat cooler and less unhealthful; but even there tropical heat and rain prevail in the equatorial belt. It is this heavy rainfall that supplies the Kongo and Nile with their immense volumes of water. Both to the north and to the south of the rainy equatorial region is the savanna belt (Fig. 356), where the rainfall varies with the season. What is the reason? What are the conditions in the savanna?

As the tropical forest grades into the savanna, so the savanna grades into the true desert (Fig. 356), where the influence of the drying trade winds is strongly felt at *all* times of the year. The northern desert is larger and better developed than that south of the equator. This is due partly to the fact that the continent is so broad in the north, and partly to the large land areas which lie to the north and east—the directions from which the winds of northern Africa must come. On the mountain slopes near the

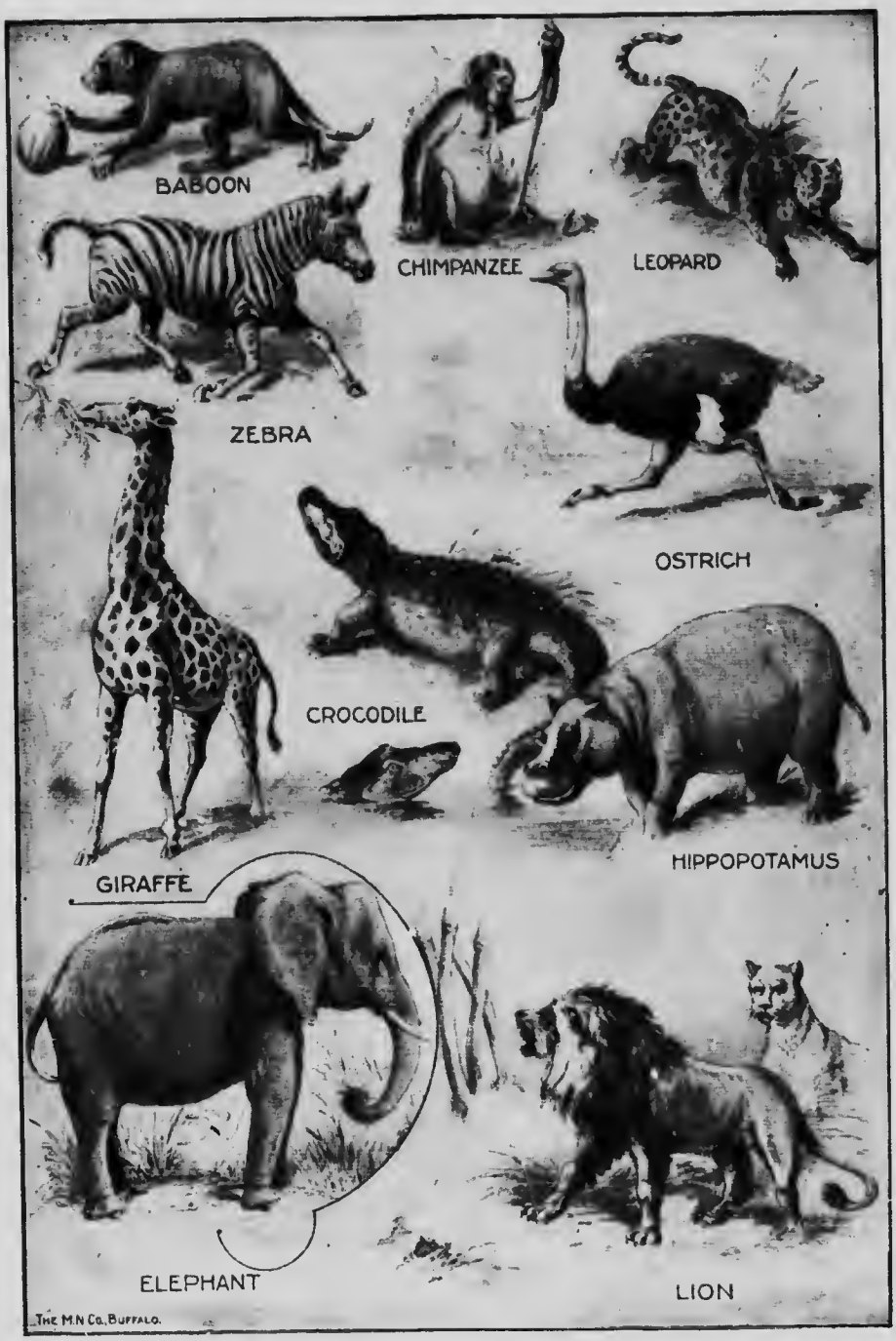


FIG. 357.

Some of the African animals.

Mediterranean there is moderate rainfall; and likewise on the south-eastern slopes of South Africa where the winds blow from the sea.

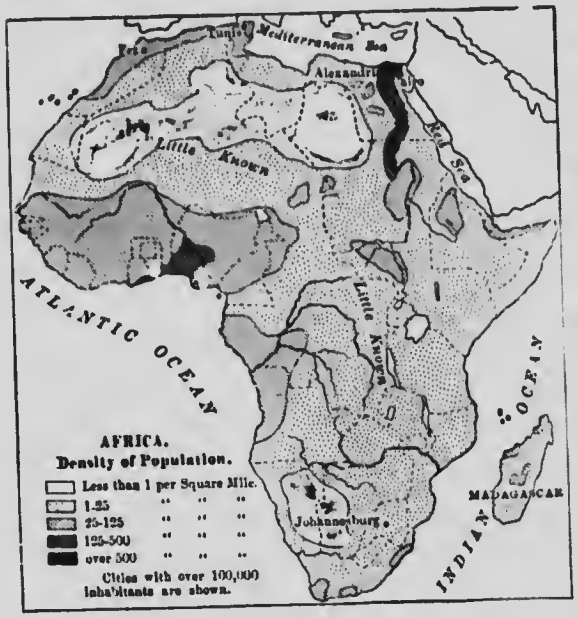


FIG. 358.

Plants and Animals. — Northern Africa is so close to southern Europe that there is a marked resemblance between the animals and plants on the two sides of the Mediterranean. The desert, however, serves as an effective barrier to their spread southward.

Portions of the desert, especially where covered with dunes of moving sand, are almost void of plant life. Animals are also few in number and limited in kind, among them being the ostrich (Fig. 357) and the camel. The oases, on the other hand, support a number of plants. Of these the date palm is most notable, for it is an important source of food for the nomads of the desert.

The open country between the desert and the tropical forest abounds in large animals (Fig. 357). Among these, on the savannas, and on the edge of the forest, are the antelope, giraffe, buffalo, zebra, elephant, lion, leopard, and rhinoceros, while the crocodile and the huge hippopotamus live in the rivers. The dense forest itself is shunned by many of the larger forms, though teeming with insect life, birds, reptiles, and tree-dwelling mammals. Among the latter are the baboon, the gorilla, and the chimpanzee (Fig. 357).

FIG. 359.
An African negro woman planting.

The People. — Central and southern Africa is the home of the negroes, who are divided into many tribes with different

customs. Some are fierce and warlike; others peaceful; those dwelling in the forest live by hunting; those upon the savannas, by primitive agriculture and by herding. For centuries they were captured by the whites and sold in slavery; but the day of the white slave-trade is now almost past. In spite of the former frequency of slave-hunting raids, and the great destruction of life in the fierce tribal wars, there are many negroes left. With a fertile soil, and in a warm climate, they are able to support themselves with a minimum of work, especially along the rivers and on the savannas.

While the forest and much of the savanna have been dominated by the negro even down to the present day, the arid sections of northern Africa

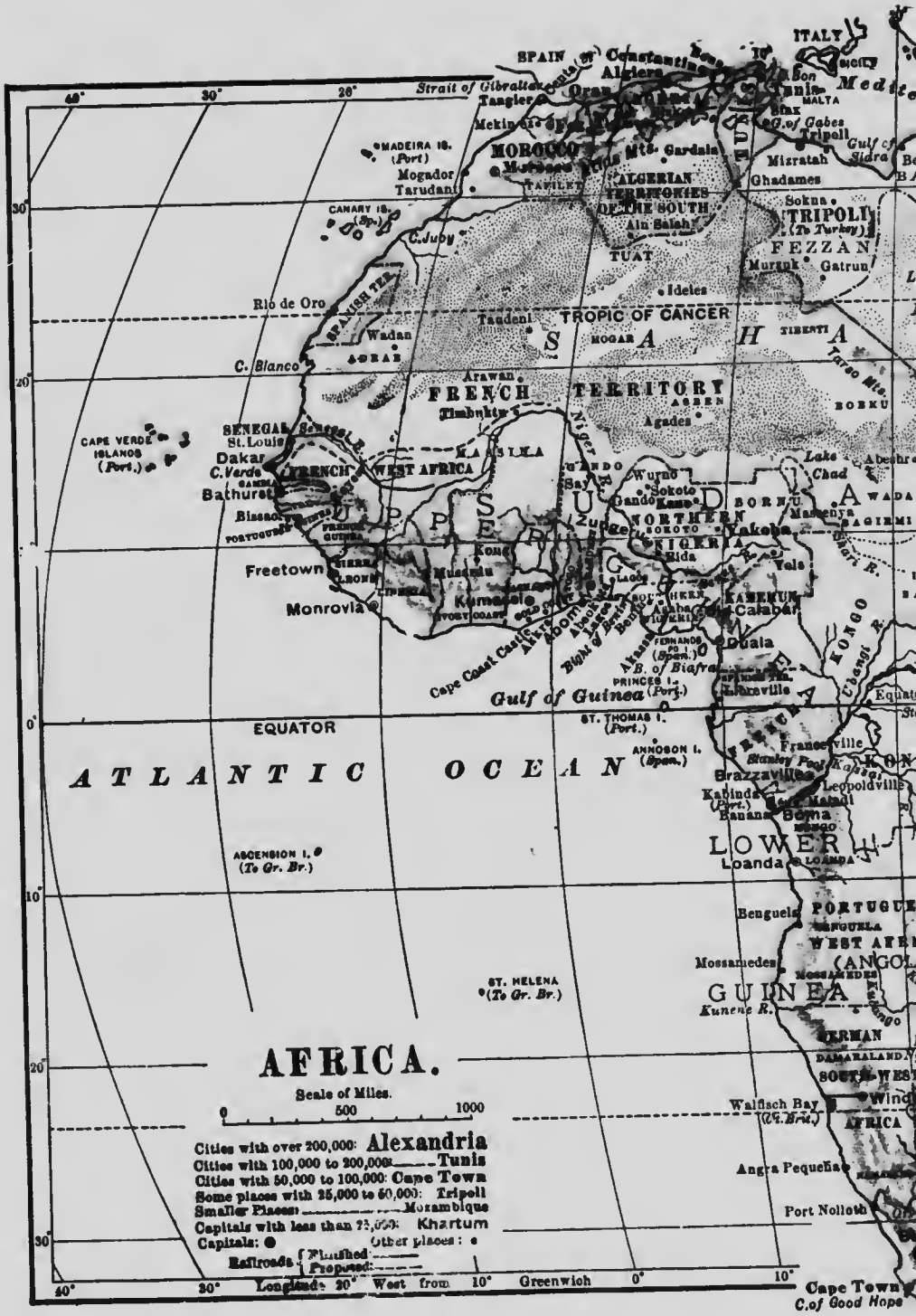
Fig. 360.

A pyramid in the desert near Cairo — one of the remarkable works of the ancient Egyptians.

have been held by the whites since very early times. Near the border line between the two races there has been such a mixture of blood that the population is largely one of half-breeds.

Exploration and Settlement.— The Indies, famed for their precious stones, spices, and other valuable products, were reached by long journeys overland. But even before the famous voyage of Columbus, the Portuguese — the most progressive sailors of that day — were engaged in an attempt to reach these distant lands by sailing around the southern end of Africa. After various voyages, the Cape of Good Hope was finally passed and the way to the Indies by water was opened in 1498.

The Portuguese made settlements on the east and west coasts of Africa, and they still have extensive possessions there (Fig. 361). But progress toward development and settlement has been slow for various reasons, among which perhaps the most important is the fact that so much of



MAP QUESTIONS.—(1) Compare the size of Africa with that of the other continents. (2) Draw a map of Africa, locating the principal mountains, lakes, and rivers. (3) What peculiarity do you notice about the location of the mountains? (4) What zones cross Africa? (5) How is the climate of Africa affected by its geographical position? (6) Find

FIG. 361.

continents. (3) What ones cross ? (6) Find the desert country north and south of the equator. Explain its cause. (7) Explain the cause of the overflow of the Nile. (8) In what section are the most railways? Why? (9) Where are the large cities? Why? (10) Draw a map of Africa, filling in the various countries and colonies.

Africa is tropical. The desert is forbidding, and the hot, damp climate of the coastal strip, upon which colonies were naturally first established, was found to be particularly unhealthful. In addition, travel into the interior was prevented by hostile hordes of blacks, and by the absence of navigable rivers. Moreover, those who were willing to leave Europe were more attracted toward the continents of Australia and America. Why should they be?

By far the most successful settlement in the newly discovered parts of Africa was that made by the Dutch at Cape Colony, a little later than their settlements in America. The whole of this district, however, is now in the possession of Great Britain.

During the nineteenth century Livingstone, Stanley, and others entered the "dark continent"; and since their efforts, exploration has been rapid. Many European nations have taken part in the exploration, and as a result have claimed territory. But the British have been by far the most active. What other nations have possessions there? (Fig. 361.)

Northern Africa

Political Divisions. — Much of northern Africa is such a desert that its inhabitants are few and scattered. It is, however, under

Fig. 362.

A nomad camp on the northern edge of the Sahara.

the control of various nations. The greater part of the Sahara is claimed by the French, though the Spanish hold a small section on the western coast, and the British control both the Libyan desert and the Egyptian Sudan in the east. Along the Mediterranean coast are several well-settled sections, the best known being Egypt.

The four countries west of Egypt — Tripoli, Tunis, Algeria, and Morocco — are often called the *Barbary States* (the home of the Berbers).

The Sahara. — From the Atlantic to the Red Sea, and from near the Mediterranean to the grass lands of the Sudan, there is almost unbroken desert — the famous Sahara. Its area is estimated to be from three to four million square miles, or about equal to that of the whole of Canada. It is a plateau of uneven surface, with mountain ranges here and there, and bordered on the north by the Atlas Mountains. The wind-swept highlands are bare and stony, while the lowlands have extensive areas of sand dunes.

Much of the soil is fertile, and with rainfall would yield abundant crops. But nature has forbidden rain, and its surface is therefore barren in the extreme. Only on the oases, of which there are some four hundred in the Sahara, is there the necessary drinking water which renders human life possible in the desert.

Caravans cross this desert, one of the important routes being from Tafilet in Morocco, southward to Timbuktu. There may be from a thousand to fifteen hundred camels in one caravan, and a full year may be required to equip it. Each camel is carefully selected by the chief of the caravan, and many extra camels are taken along to replace those that give out on the journey. There is one driver for every dozen camels.

Upon starting, the loads are carefully packed on the camels' backs, each animal bearing about three hundred pounds. A day's march lasts sixteen hours, the camels travelling some thirty abreast at the rate of about two miles an hour. Ordinary camels cannot travel more than three days without drinking; but the better grades are able to go for six or seven days without water and with almost no food. The trip across the Sahara, from north to south, requires fully three months. Estimate the distance. At best nearly a third of the animals perish in the round trip; and before the return journey is undertaken it is necessary for those surviving to have a rest of several weeks.

An advance party precedes the caravan to make arrangements for camping and for water. Many roundabout journeys are necessary to pass deep valleys and plateaus, for caravans go around rather than over obstacles. The daytime is hot; but as soon as the sun sets, the temperature rapidly falls and the nights become cold even in midsummer.

There are dangers in the journey aside from that of thirst. Sometimes sand storms arise; and although such a storm may not last a half-hour, it may destroy a whole caravan. The wind blows violently, and sand fills the air and drifts about in such quantities that animals and men alike are suffocated in the drifts. Also small caravans may be attacked by wandering tribes of warlike natives; and near the southern edge of the

desert the danger from attack by the lion is added. It evidently requires courage and great powers of endurance to engage in the caravan trade.

Caravans which cross the desert carry the products of central Africa to the coast. These include ivory, skins, and ostrich feathers obtained by bartering with the negroes.

Egypt and the Neighboring British Territory. — Egypt proper and the Libyan desert are parts of the broad Sahara and have all the features of the desert just described. Even at Cairo the average yearly rainfall is but an inch and a half. In climate, both for summer and winter, northern Egypt closely resembles the desert portion of southwestern United States.

FIG. 363
Sudanese people from the Egyptian Sudan.

The Nile. — The Egyptian Sudan and the country south of it, on the other hand, have a tropical climate, arid in the north, but warm and humid in the south, where the influence of the tropical rains is felt. The headwaters of the Nile, near the equator, are fed by such heavy rains that the river is able to flow across the desert in spite of the fact that no tributaries enter the lower half of its course. How great a distance is that?

Without the Nile the whole of northern Egypt would be a sparsely inhabited desert (Fig. 360); but the precious river waters transform the section near the Mediterranean (Fig. 364) into a great oasis which has become the seat of an important agricultural industry, and is densely populated.

After leaving the region of equatorial rains and the savannas, the Nile crosses the desert through a valley — in places a thousand feet in depth — which it has cut in the plateau. In this part of its course there are several cataracts (see Fig. 361). The Nile resembles the Colorado River in the United States, which, after leaving the Rocky Mountains, flows in a deep canyon across an arid plateau (p. 219); but the canyon of the Colorado

is much deeper than that of the Nile. Below Cairo the river leaves its narrow valley, divides into several channels, and flows across a plain (Fig. 364). This plain is the *delta* which the Nile has built in the Mediterranean Sea during the ages that the river has been bringing sediment from its upper course. It is the Nile that suggested the geographical term, delta,

FIG. 364.

The lower Nile. The shaded area between the two deserts is farming land which is reached by water from the river. The numerous crossed lines are railways. Find the Pyramids. Why is the location at the head of a fertile delta, and at the outlet of a narrow river valley bounded by desert, a favorable one for a large city?

now applied to similar deposits at the mouths of rivers in various parts of the world. The word comes from the Greek letter delta (Δ), which has the form of a triangle. Notice that shape in Figure 364.

When the rainy season comes to the Nile tributaries among the Abyssinian mountains, the river rises so high that it overflows large

tracts of the broad delta below Cairo. The rise begins in June and reaches its height in October. By this overflow not only is the land irrigated, but a thin layer of fine mud is spread over the fields. This serves so to fertilize the soil that, year after year, heavy crops may be raised without making the soil sterile.

Agriculture. — In consequence of these remarkably favorable conditions, the Nile delta has been occupied by an agricultural people from the very earliest times. It is still the seat of a great grain industry, producing wheat, corn, millet, and barley. Much rice and sugar-cane are also raised, and cotton which is of especial value

FIG. 365.
The Sphinx and two of the Pyramids.

because of its long fibre. There are many vineyards, and orange, lemon, and fig groves ; and both along the Nile and on the oases of the desert there are groves of date palms (Fig. 360). Grazing is of importance in the Nile Valley and on the neighboring plateau. The animals raised include the buffalo and camel in addition to sheep, goats, cattle, horses, and donkeys.

The People. — The known history of Egypt reaches back several thousand years before the time of Christ. The fertile soil and favorable climate, added to the protection from frequent wars which the surrounding desert and sea afforded, encouraged the development of industry and thrift. By the mixture of agricultural and pastoral

races there arose a civilization in advance of that of the neighboring sections of Europe and Asia. In fact, at the time when Europe was inhabited by barbarians, and the peoples of western Asia were unorganized, Egypt had made long advances in civilization.

Fig. 366.
An obelisk in Egypt.

We read in the Bible of the Pharaohs who ruled over Egypt. Can you recall any of the Bible stories which relate to these rulers; for example, the story of Joseph? During those times the Egyptians built the obelisks (Fig. 366), the sphinx (Fig. 365), and those marvellous structures the pyramids (Fig. 360), which are really the tombs of kings. By a peculiar process they preserved the bodies of their dead, and these *mummies* may be seen in the museums of many large cities. Among the mummies are the remains of the Pharaohs themselves.

In the movement westward of the people who dwelt along the eastern shores of the Mediterranean and farther east in Asia, Egypt became one of the highways of the world. Against its people many destructive wars were waged, and the country has been repeatedly invaded. As other nations have advanced, the Egyptians have steadily lost ground.

At present Egypt is required to pay annual tribute to Turkey, but she is otherwise practically independent of Turkey; and the ruler, or *Khedive*, is an hereditary monarch. The government of Egypt was so bad that Great Britain and France finally stepped in and took control of the finances of the nation. When the French declined to aid in subduing a rebellion in Egypt, Great Britain alone assumed the control of Egyptian affairs.

As a result of British direction there has recently been marked progress in Egypt. Extensive irrigation works have been undertaken, and the land area for cotton and sugar-cane has thereby been greatly increased. The gigantic dam recently completed at Assouan will do much to benefit the district. Several railway lines have also been built (Fig. 364), including a part of the proposed line from Cairo to Cape Town, thus giving an outlet to the products of Central Africa. Outside of the Nile Valley, however, travel still depends largely upon the use of camels (Fig. 360).

Suez Canal. — Northeastern Egypt includes the Isthmus of Suez, which connects Africa with Asia. This narrow neck of land has for centuries stood as a barrier to water travel from Europe to southeastern Asia, compelling European vessels to pass all the way around Africa in order to reach southern Asia.

The Suez Canal, begun in 1859, was completed in 1869. It extends from SUEZ to PORT SAID (Fig. 443), and is eighty-seven miles long, with a depth of twenty-six feet and a width at the surface varying from sixty-five to one hundred and twenty yards. Its length is much greater than that of the proposed Panama Canal, but the difficulties of construction were less. The country is very level, a part of the course (about twenty-one

FIG. 367.
The Suez Canal at Port Said

miles) being through a lake. Ten vessels on the average pass through the Suez Canal each day. Estimate the distance saved by this canal in going from London to Calcutta. By agreement among nations it cannot be captured and closed in time of war.

Cities. — At the head of the delta, just above the point where the Nile branches (Fig. 364), is CAIRO, the capital and largest city of Egypt and, in fact, of all Africa. It is almost twice the size of Montreal. This interesting place is visited each year by a stream of tourists, some seeking a winter health resort, others attracted by the strange life of the country and the remarkable ruins of the old civilization (Figs. 365 and 366).

Cairo itself contains the palace of the Khedive, several interesting mosques, and a museum in which are preserved many Egyptian antiqui-

ties and works of art. The inhabitants also attract attention, for in the streets may be seen many people with different languages and peculiar customs. The differences among the people may be illustrated by the following fact: there are three Sabbaths each week, Friday, the Sabbath of the Mohammedans, Saturday, observed by the Jews, and Sunday, by the Christians.

Fig. 368.
An Arab school in the streets of Cairo.

Alexandria, connected with Cairo by rail (Fig. 364), is the seaport of Egypt and the second city in size in the country. The chief business is the export of cotton, sugar, grain, and other Egyptian products, and the importation of manufactured goods. More than half the trade is with Great Britain.

The Barbary States. — Find the position of each of these four countries. Each borders the Mediterranean, but extends southward into the desert.

The Atlas Mountains skirt the Mediterranean coast from the Atlantic to Tunis, where their projection into the Mediterranean forms the most northerly point in Africa. These mountains contain many valuable mineral products, including precious metals in Morocco and Algeria, and marble and alabaster in the latter country.

Fig. 369.
The costume of women in Algeria.

Since the Atlas Mountains cause vapor to be condensed when winds blow from the ocean or from the Mediterranean, many of the valleys are well watered. Forests cover some of the mountain slopes, and one of the valuable trees is the cork oak, the bark of which is removed for shipment from Algeria to Spain and Portugal. Camels, sheep, goats, and cattle are raised among the mountains and upon the plateaus.

Agriculture is carried on here and there, often by means of irrigation, with water supplied by the mountain snows and rains, as in southern Alberta. The villages are therefore situated where valleys open to the plains. Among the crops produced, besides dates and grains, are figs, grapes, and olives. Wine from the grapes of Algeria is shipped in large quantities to France; and the best olive oil and the best dates in the world come from Tunis.

The original occupants of this region, the *Berbers*, still dwell on the desert and among the mountains, having been driven there long ago by invading Arabs. Most of the inhabitants are Mohammedans. Tripoli is still a Turkish province, but Tunis and Algeria are held by France. However, the native ruler, or *Bey*, of Tunis is permitted to direct affairs in his country under the supervision of France. Morocco is the only one of the Barbary States that maintains independence, being ruled by an absolute monarch, or *Sultan*. However, in 1906, as a result of a conference of the great powers, the country was placed under the supervision of France and Spain, with the former largely in control.

FIG. 370.
Church of Notre Dame in Algiers.

Conditions of life in Morocco are still primitive. A native school in Tangier may serve as an example. About a dozen boys, varying in age from nine to ten years, were present. The room where they studied received its only light from the open door, and it contained no seats, desks, or furniture of any kind. The children sat on the floor in a semi-circle around a long-bearded old man, who likewise sat on the floor, and the only object they had before them was a page from the Koran, or Mohammedan Bible. What does such a condition of education indicate in regard to progress? If this is the case on the coast, what must be the condition farther inland?

The capitals are the principal cities among the Barbary States. FEZ, one of the capitals of Morocco, is in the interior; but the Sultan and his court do not reside there all the year. Name the other capital. TANGIER, on the coast, is better known. Why should it be? In Algeria, the seaport ALGIERS is the capital and largest

city. It is an interesting place, combining many features of ancient and modern times. Under the French it has become an important trading centre. The same is true of TUNIS, the capital of the country by that name. Locate the capital of Tripoli.

SOUTHERN AFRICA

Comparison with Northern Africa. — In some important respects there is a resemblance between northern and southern Africa, although they lie in different hemispheres. What similarities are there between the two parts in climate and physiography? There

FIG. 371.

A Zulu woman making a straw mat.

is a resemblance, too, in the fact that both sections have long been settled by white men. What difference is there in the length of occupation by white men?

The People. — It is to the Dutch that we owe the first important development of South Africa. Settling at Cape Town, and then spreading over the neighboring region, they took possession of the country occupied by the negroes and introduced the European industries of farming and ranching.

When Cape Colony came into possession of the British, many of the Dutch, or *Boers* as they were called, remained; but others emigrated, or "trekked," northward and found new homes in the interior. There they established two republics, the Transvaal and the Orange Free State. Valuable mines, however, were discovered in the country, and miners flocked there in thousands. The Boers

looked upon the miners merely as a source of revenue, and friction arose. As most of the mine owners were British, Great Britain interposed and war followed. As a result the Transvaal and the Orange Free State were declared British colonies in 1900. A limited representative constitution was granted to the Transvaal in 1905.

FIG. 372.

A pineapple field in South Africa.

At present, therefore, the British control a broad strip from the southern tip of Africa northward to the southern end of Lake Tanganyika. What are the names of the British colonies in South Africa (Fig. 361)? What nations control the land to the east and west of the British possessions? Besides the Boers there are many British in South Africa, especially in Cape Colony and at the gold mines of the Transvaal. There are also large numbers of negroes in this region, particularly in the tropical section and in Zululand in northern Natal (Fig. 371). Some of them, like the Zulus, have fiercely opposed the encroachment of the whites and still maintain semi-independent states. They are, however, making progress toward civilization.

Agriculture and Grazing. — Along the east coast, and in some of the interior valleys, agriculture is an important industry. Sugar, bananas, pineapples (Fig. 372), tea, coffee, and rice are raised near the coast, where the climate is warm and damp. But wheat, tobacco, vegetables, and grapes are produced in the cooler south, and upon the uplands wherever the rainfall is sufficient or irrigation possible.

By far the greater part of South Africa is an arid plateau, and its elevation causes cold winters in spite of the latitude. Forests are absent, and little wood is found except that which comes from the thorny acacia bushes of the plains, and the willows and other trees that grow along the streams. Except in the real desert the grass springs into life after the summer rains (November and December), and the country becomes green and beautiful. Then follows a long drought, when the vegetation withers. But, as in

the ranching portion of Alberta, the dried grass is a sort of natural hay upon which cattle and sheep thrive.

Upon this plateau, therefore, immense numbers of cattle, sheep, and goats are raised, and also many ostriches. It is estimated that in Cape Colony alone there are over eighteen million sheep and goats, one million cattle, and two hundred and fifty thousand ostriches. In consequence, the production of wool, hides, meat, and ostrich feathers is of great importance. Of what value are these products to Great Britain?

Mineral Wealth. — The discovery of gold in South Africa has brought great changes, all of them of far-reaching importance.

FIG. 373.

Cattle in the Transvaal.

This metal is found scattered through a conglomerate rock in the Transvaal colony, near the city of JOHANNESBURG, which on that account has become the largest city of South Africa. This district has become the greatest in gold production in the world, and by the discovery of new mines promises to become still more noted.

Other valuable minerals, including copper, iron, and coal, also occur; but as yet they have been little developed. At KIMBERLEY in Cape Colony, however, are diamond mines, which now supply ninety-eight per cent of the world's diamond product.

The diamonds occur as rounded crystals in a decomposed volcanic rock, and are obtained by digging out the soft rock and carefully removing the crystals. After this the crystals must be cut into the proper

shape and polished. There are various grades, some clear and beautiful, others impure and dull. So productive is this deposit of precious stones that $160,000,000 worth have been removed in eleven years. There is only a limited demand for diamonds; but the company in control is careful not to mine enough of them to reduce the price greatly. This is possible, since the Kimberley mine owners have a practical monopoly of the diamond production of the world.

Commerce and Cities. — The two chief rivers of South Africa are of little use as trade routes. The Orange River is not navigable, because of lack of water and the presence of rapids at the edge of the plateau. The other, the Zambezi, is navigable by small boats for a

FIG. 374.

Cape Town, with Table Mountain (3500 feet high) in the distance.

distance of three hundred miles from its mouth; but the climate near the coast, especially on the delta, is warm and unhealthful. Rapid water checks further navigation, and at one point there is a cataract, the Victoria Falls (Fig. 361), which rivals even Niagara in grandeur. This cataract has a width of over a mile and a height of four hundred and fifty feet. It is therefore both wider and higher than Niagara; but the volume of water is less.

Nor is the coast especially favorable to commerce. For long distances there are no good harbors, while the river mouths are choked with sand bars which render entrance difficult. A breakwater has made Table Bay a good port, and around its shores, beautifully situated at the base of the Table Mountain (Fig. 374),

is CAPE TOWN, the capital and largest city of Cape Colony. It is connected with the interior by a railway line, the southern end of the proposed railway from Cape Town to Cairo.

A second important harbor is that of Delagoa Bay, upon which is situated LOURENÇO MARQUEZ, the capital of Portuguese East Africa. Being connected by rail with the interior, this port has been much used for the shipment of Transvaal products. DURBAN, the seaport of Natal, is a small city also connected with the Transvaal Colony by rail. The two principal interior cities are KIMBERLEY and JOHANNESBURG. PRETORIA

FIG. 375.

A scene at the market in Kimberley. Oxen are extensively used by the Boers.

in the Transvaal Colony and BLOEMFONTEIN in the Orange River Colony are important places. LADYSMITH and MAFEKING are celebrated for events that occurred there during the Boer War. *Walfisch Bay* in German South Africa belongs to Great Britain.

CENTRAL AFRICA

This vast area is in large part a great unknown. Much of it is tropical forest; but on the north and south are open savannas.

The Rivers. — Owing to the heavy rainfall of the forest belt, the rivers are large. The Nile and Zambezi, already described, and the Niger and Kongo, all receive water from the equatorial rains. The Niger is navigable in sections; but there are rapids in some parts, and in its northern portion the river dwindles in size because of the dry climate.

It is the immense Kongo, which empties into the sea a few degrees south of the equator, that offers the best means of entrance to Central Africa. Although it is interrupted by a series of falls a

short distance from the coast, above Stanley Pool there are thousands of miles of navigable waters in the main river and its tributaries.

It was Stanley who first explored the Kongo, in 1876; and since that time this part of Africa has been rapidly developing. Formerly it was

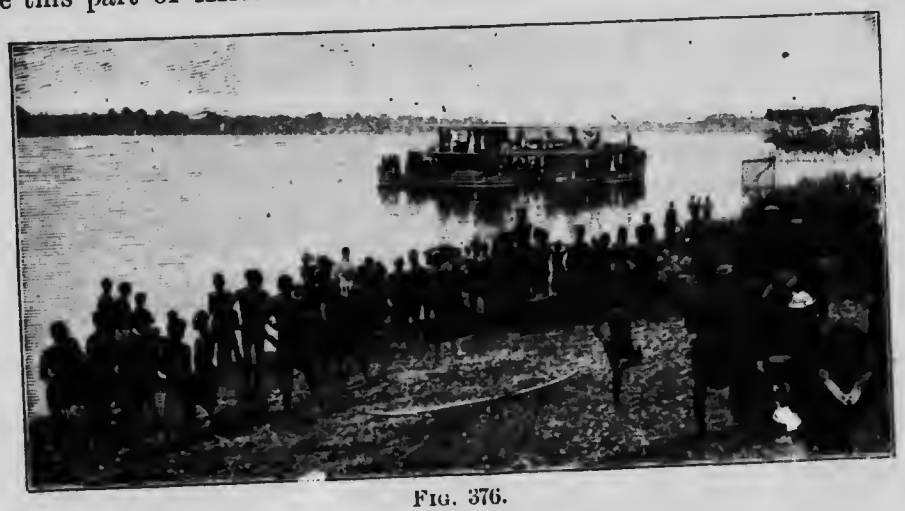


FIG. 376.

A steamer on the Kongo.

necessary to carry goods around the rapids, each native porter carrying about sixty pounds. Only in this way was Stanley able to carry his boats to the navigable portion farther up stream. Now, however, a railway two hundred and fifty miles in length connects the lower Kongo with Leopoldville on Stanley Pool above the falls. Thence, at all seasons of the year, steamers may go a thousand miles up the river and also into many tributaries.

FIG. 377.

Huts in a negro village in Africa.

The People. — Very few Europeans have settled in Central Africa, and the native blacks live almost as their ancestors did. Most of the inhabitants live in ingeniously built huts clustered in villages (Fig. 377). They have a kind of tribal government, each tribe having a leader whose power is absolute, and under whom are minor chiefs. Some of the tribes are cannibals. In religion they vary greatly, though all are intensely superstitious.

Among the blacks none are more remarkable than the *pygmies* whom

Stanley discovered in the equatorial forests, where large numbers live in an area of about thirty thousand square miles. The adults are only three or four feet in height. They live exclusively by hunting, by gathering the vegetable products of the forest, and by theft from the neighboring agricultural tribes. Their villages are usually built in the forest where two paths cross, and the huts are shaped like a turtle's back, being about four and a half feet high, ten feet long, and five or six feet wide. In that hot climate they find need for little clothing.

With a small spear, a short bow with poisoned arrows, and a knife, they hunt with wonderful skill, and by means of pitfalls they capture even the elephant. They know the forest intimately, and neither bird nor beast can escape them. According to Stanley they offer one of the greatest obstacles to exploration; for they appear stealthily, attack a party with great courage, and then disappear in the trackless woods.

Divisions of Central Africa. — European nations have been active in claiming the greater part of Central Africa; but their control over the native inhabitants is merely nominal, and the boundaries of the different sections are not well defined.

The Sudan includes the vast area between the Sahara and the tropical forest. What can you tell about the climate of the district? More than half of the Sudan is claimed by the French, and most of the remainder, including the *Niger Territories* and the *Egyptian Sudan*, is held by the British. The inhabitants are nomadic in the north, and agricultural in the south, though they raise little more than is needed for their own use. There is some gold in the west; but the principal products are ivory, ostrich feathers, and gums.

East of the Sudan is *Abyssinia*, which is for the most part a rocky plateau crossed by mountains and difficult of access. Its condition is indicated by the fact that the capital is periodically changed when the supply of firewood is exhausted. It is evident, therefore, that there are no government buildings. The inhabitants are mainly whites belonging to very different tribes which are often hostile to one another. Many of the people still hold to Christianity, notwithstanding the invasion by Mohammedans nearly four centuries ago. Italy holds *Eritrea* and *Italian Somaliland*. What other nations occupy a part of the coast on the border of Abyssinia?

The map shows several small countries on the west coast of Africa in the part marked *Upper Guinea*. Find *Lower Guinea*. The divisions colored pink belong to the British; those marked green to the Germans. Find a section belonging to Spain.

Sierra Leone, a crown colony, was established during the last century by Great Britain as a home for liberated slaves. Its chief town is FREETOWN. The example of Great Britain was followed by the United States

in the establishment of *Liberia*, a negro republic, with its capital at Monrovia. No white man is permitted to become a citizen of Liberia. Besides uncivilized negroes in the interior, the republic includes fully twenty thousand negroes with some knowledge of civilization, all living near the coast. The coastal strip is damp and unhealthful; but behind it is the forest-covered plateau slope. The products are chiefly coffee, palm oil, and sugar. A considerable trade is carried on.

Kongo State, crossed by the equator and drained by the Kongo and its tributaries, was founded by the king of Belgium, who supported Stanley in his explorations of this region. It is in large part

FIG. 378.
A scene in tropical Africa.

a forest-covered plateau; but there are sections of grass land. Hordes of savages, including the pygmies, inhabit the forests and savannas; the buffalo, elephant, and leopard live along the rivers; and the roar of the lion is frequently heard.

Through the building of the railway around the cataract of the Kongo, and by the aid of steamers above and below the falls, the resources of this great area are beginning to be drawn upon. From it are obtained large quantities of ivory, rubber, palm oil, gum, and pepper, as well as tropical woods.

East of the Kongo State are British and German territories. What are they called? What is their climate? What products would you expect? Observe to what extent Great Britain is interested in Africa.

What break is there in the British territory between the Cape of Good Hope and the Mediterranean? What variety of climate does the British territory include?

Need of Railways. — One of the great needs of Central Africa is railways for transportation to and from the sea. The three large lakes, Nyassa, Tanganyika, and Victoria Nyanza, are of great service in the transportation of goods, and already there are steamers upon them. Elsewhere caravans of native porters bear the products on their backs, travelling along narrow paths through the forest.

With British and German energy we may expect that railways will soon reach the various parts of the interior of Africa; in fact, a railway to Victoria Nyanza is already well under way (Fig. 361).

Islands near Africa

The large island of *Madagascar*, which is nearly as large as Ontario, is two hundred and thirty miles from the mainland. There is much highland in the country, especially on the eastern side; but the coastal region is lowland. The island is controlled by the French, and produces cattle, hides, valuable tropical woods, rubber, and coffee. While there are some Arabs, and tribes of negro origin in the west, the natives are for the most part Malays, called *Hovas*, who came by water from the northeast.

Of the many small islands near the coast of Africa the northernmost are the *Madeira Islands* on the west side. These, together with the *Cape Verde Islands* farther southwest, have belonged to Portugal since the early Portuguese voyages of discovery. The Spanish *Canary Islands* lie between these two groups. Find other islands along the west coast (Fig. 361) which belong to Spain and Portugal.

Ascension Island and *St. Helena*, south of the equator, are, like the above-named groups, volcanic. They belong to Great Britain, and St. Helena attained celebrity as the prison home of Napoleon Bonaparte. The principal small islands on the eastern side of Africa are *Zanzibar* (British) near the coast, and *Reunion* (French) and *Mauritius* (British) east of Madagascar. Locate each of these (Fig. 361). Find other French and British islands. These islands are of value as naval stations. Their inhabitants are engaged in fishing and in agriculture, raising sugar-cane and other tropical products.

Review Questions. — (1) What is the shape of Africa? (2) Compare the coast of Africa with that of other continents. (3) Tell about the highlands; the rivers and lakes. (4) Describe the belts of climate, and compare them with those

of South America. (5) Tell about the plant and animal life. (6) Tell about the people. (7) Tell about the exploration and settlement. (8) What have been some of the principal obstacles to such explorations and settlements? (9) Name and locate the Barbary States. (10) What portions of northern Africa are under the control of European countries? (11) Describe the Sahara. (12) Describe the caravan trip. (13) Tell about Egypt: the climate; the Nile River; agriculture; people and government; Suez Canal; principal cities. (14) Describe the Barbary States: their raw products; manufactures; commerce; inhabitants; government. (15) State resemblances between northern and southern Africa. (16) Tell about South Africa: the people; agriculture and grazing; mining. (17) What about the value of the Orange and Zambezi rivers for commerce? (18) Locate and tell about each of the cities: (*a*) Cape Town; (*b*) Lourenço Marquez; (*c*) Durban; (*d*) Kimberley; (*e*) Johannesburg. (19) Tell about Central Africa: the climate and rivers; the people and their customs. (20) Name and locate the principal divisions of Central Africa. (21) Tell about: (*a*) the Sudan; (*b*) Abyssinia; (*c*) Somaliland; (*d*) Sierra Leone; (*e*) Liberia; (*f*) Kongo State. (22) What about the need of railways?

Suggestions. — (1) How do the negroes compare with the Indians in their willingness and ability to adopt civilized customs? (2) Read the Bible story of Joseph in Egypt. (3) Read the story of Moses. (4) Find out some facts about the Pyramids. (5) Why is Great Britain especially benefited by the Suez Canal? (6) What obstacles are in the way of building railways across the Sahara to take the place of caravans? (7) Why was the southern point of Africa called the Cape of Good Hope? (8) Examine a diamond to see how it has been cut. (9) Find out something about missionary work in Africa. (10) What reasons can you give for sending missionaries there? (11) Find out about the peculiar animal life upon the island of Madagascar. (12) Compare Madagascar with Cuba in regard to latitude, area, products, and people. (13) Find some facts about Livingstone, Mungo Park, Stanley, and other African explorers. (14) Read one of the books of these explorers; you will find Du Chaillu's books on Africa very interesting. (15) Who were Bartholomew Diaz and Vasco da Gama, and what part did they take in the discovery of the water route to India? (16) Find out what you can about the Boer War.

III. AUSTRALIA AND ISLAND GROUPS

Australia

Physiography. – Australia lies apart from the rest of the world, an island continent in the water hemisphere and the only continent wholly in the southern hemisphere. Isolated for ages, its plants and animals differ (Fig. 381) from those in other parts of the earth. With its area of nearly three million square miles, it approaches Canada or Europe in size. But it has been settled by Europeans so recently, and so much of its surface is desert (Fig. 385), that it is much less densely populated than the other continents. Much of the interior is practically unexplored, partly because of the desert and partly because of the absence of interior navigable waters.

The surface, like that of Ireland, suggests a plate in form, since the low interior rises gradually to plateaus and mountains which often descend steeply toward the sea. While there are some low, short ranges in the interior, the highest land is in the east, where the mountains run parallel to the coast. In the southeast some of the peaks reach a height of over a mile.

The mountains of eastern Australia, like the Appalachians of North America, are the worn-down remains of an ancient mountain system. Still further like the Appalachians, they served to check the extension of early settlements inland. Tasmania is really a continuation of the eastern highland, as Newfoundland is a continuation of the mountains of eastern North America.

The streams which flow eastward to the Pacific, cascade down the mountains in short courses. Of the others in eastern Australia some end in the lakes of interior basins, and some evaporate in the dry climate; but many unite with the Darling and Murray rivers, which are at times navigable for long distances. During the dry summer season, however, all except the Murray may dwindle to mere chains of water holes. A wave-built bar at the mouth of the Murray closes it to ocean steamers, so that no large cities have grown up along its banks.

FIG. 379. — Relief map of Australia.

The coast line of Australia is so regular that for long distances there are no good harbors; but the sinking of the land in the southeastern part has caused some excellent ports.

Off the northeastern coast is the *Great Barrier Reef*, the longest coral reef in the world. This has been built by coral animals, which still thrive there in great numbers. A few openings allow ships to enter the quiet channel between the reef and the land; but navigation is not easy, and only an experienced pilot can avoid the dangerous shoals. Small sailboats carrying divers and their assistants, usually Malays, are engaged on this reef and the northern shores of Australia in fishing for pearls, pearl shell, and other products of tropical waters.

Climate. — Since Australia lies within the belt of the southeast trade winds, the eastern highland has an abundant rainfall on its seaward side and is clothed with dense forests. After crossing the mountains, however, the winds are so dry that the forest gradually disappears, changing first to open, park-like woodlands, then to grass-covered uplands, and finally to desert lowlands, still partly unexplored. The low interior mountain ranges cause only a slight rainfall which supplies the salt lakes of the interior.

FIG. 380.
Eucalyptus forest in Australia.

During the southern winter the interior becomes cold, and the heavy air presses outward toward the coast as cold land winds; but during the summer the dry interior is so intensely heated that monsoon winds blow from the northeast and bring equatorial rain to the northern coasts. In this section are found areas of tropical forest. Southwestern Australia and Tasmania are reached by the prevailing westerlies, with their cyclonic storms, which bring variable weather and rainfall, as in eastern Canada and United States. These rainy sections are also clothed with forests.

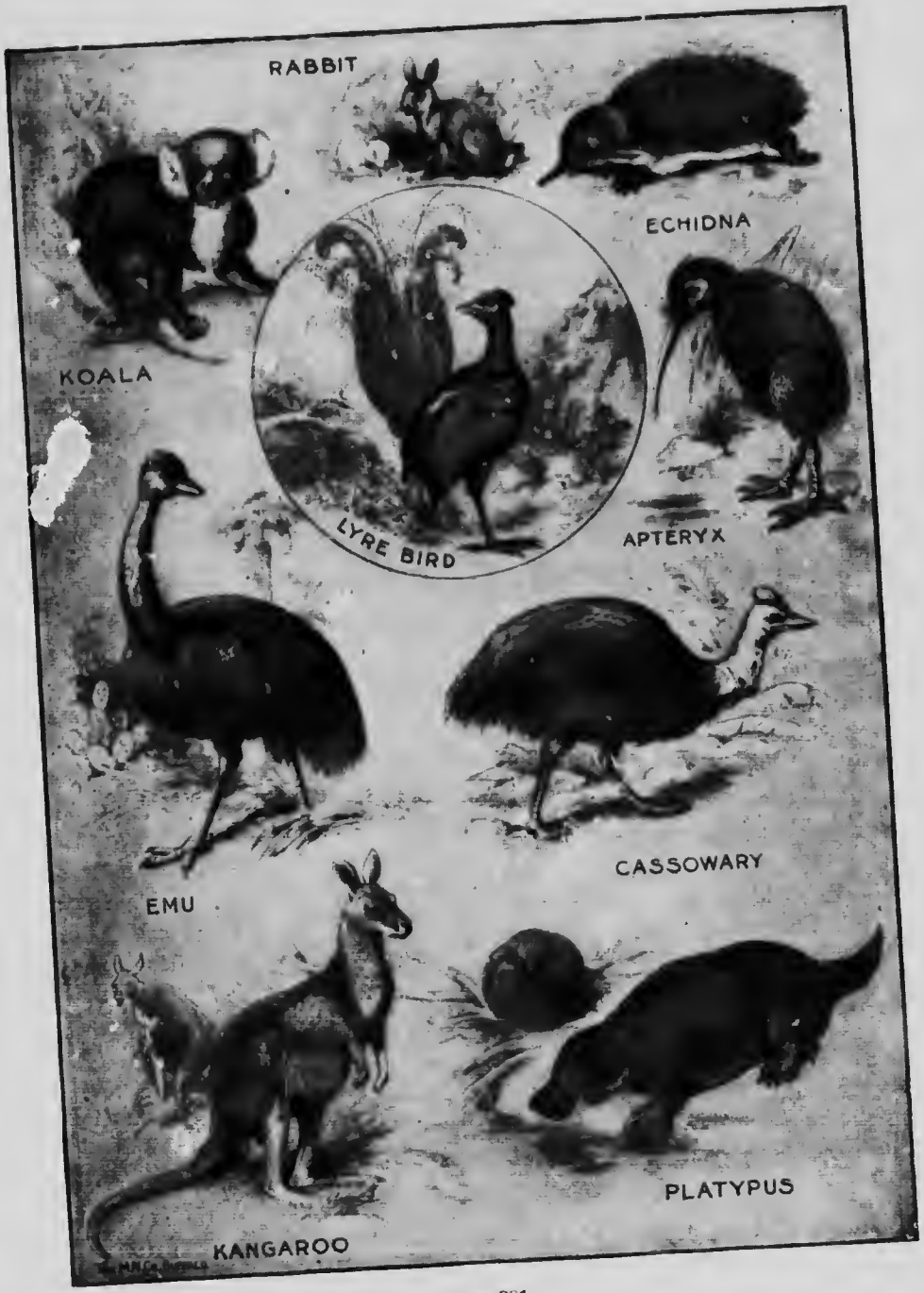


FIG. 381.

Some Australian animals. The platypus lays eggs like a bird or reptile. The kangaroo, like other marsupials, carries its unprotected young in a pouch. Where else have we found large running birds like the emu?

It is therefore only along portions of the coast that there is enough rainfall for agriculture, while the interior, and much the greater part of the continent, is either arid or actual desert. Much of the interior is adapted to ranching, though some parts are even too arid for that; but the southeastern coast, with an equable climate which reminds us of the Mediterranean, would support a dense population.

Fig. 382.

Undergrowth in the Australian forest.

Plants. — Australian vegetation is not only peculiar, but also strikingly adapted to the climate of the country. In the interior, as in other desert regions, grass and flowering plants have gained the power to make rapid growth and to mature their seeds quickly, so that a few days after a rain the barren sands become carpeted with green as if by magic.

Among the desert grasses, one of the most remarkable is the porcupine grass which grows on the sandy plains of the northwest interior, and is so hard, wiry, and spiny as to prevent passage through it. Plants with leaves which taste of salt also thrive here, being fitted for growth on plains that are too dry and alkaline for grass. These "salt bushes" are so valuable as forage for sheep and cattle that they have been introduced into other countries for this purpose.

The scrub trees that flourish in the arid interior have developed a foliage able to resist evaporation. For example, the gum trees (Eucalyptus) hold their narrow leaf blades vertically with only the edges toward the sun's rays; the leaves of wattles (Acacia) and other plants have shrunk to thorns; and some trees secrete odorous oils which check evaporation. The leaves are too tough and leathery to wilt, and their dull greens give a sombre tone to the scattered woods. In these interior forests, which the settlers call "scrub," the thorny acacia and the close-set stems of the gum — rising to a height of a dozen feet — form a thicket through which a lost traveller may wander until death relieves his thirst.

On the equable rainy slopes near the coast some of the gum trees are giants, in some cases four hundred feet in height. They rival the Douglas fir of British Columbia, which also thrives where damp winds blow from the ocean. The undergrowth of the forest (Fig. 382), which is almost tropical in character, includes tree-ferns, palms, and orchids. These dense woods are called the "bush."

History. — When discovered, Australia was sparsely settled by blacks allied to the negroes of Africa, but differing from them in many respects. Of these savages it is estimated that about seventy thousand remain, of whom about a third still wander in the wild interior, scantily clad (Fig. 383), building the rudest of shelters, and gaining their living by hunting. They still use that peculiar weapon, the *boomerang*, which, when properly thrown, will fly in curves and even return to the thrower.

Fig. 383.

An Australian savage. (See also Fig. 273.) The boy has a boomerang in his hand

Although for a long time it had been known that there was an Australian continent, settlements were not made there until 1788. Neither the country nor the products were tempting to the early Spanish and Dutch explorers, and those nations colonized other lands of greater promise. It was not until the famous English navigator, Captain Cook, led an expedition to this southern continent that the fertile southeastern coast was discovered.

For a time the distant land was used as a regular penal station to relieve the crowded condition of English jails, and naturally free settlers came to the country slowly. But their number gradually increased, and, after long agitation, the transportation of criminals was stopped.

About the middle of last century, gold in abundance was discovered in southeastern Australia, and tens of thousands of people rushed there to get the same for the precious metal. Since the miners needed supplies, many of the settlers turned their attention to other industries, especially agriculture and grazing. Therefore in Australia, as in many other places, gold mines led quickly to the development of the country's resources.

Fig. 384.

Density of population in Australia and neighboring islands.

New South Wales, as the first colony was called, finally grew so large, and the settlements were so scattered, that it became difficult to control it

under a single government. Consequently Tasmania, Victoria, and Queensland were successively set off as separate colonies. South Australia and West Australia, however, were settled as distinct colonies.

The colonies prospered under their popular government, each with its own laws, some having free trade, some imposing tariffs on goods imported from other colonies. Common interests, however, early awakened a desire for union; and finally, on January 1, 1901, they were united to form the *Commonwealth of Australia.* This new commonwealth has a government similar to that of Canada, and is independent of Great Britain in all matters except those which affect the Empire as a whole. The population, about four millions at the present time, is rapidly growing. Immigration is strongly encouraged.

FIG. 386.
The last Tasmanian, a race now entirely extinct.

Nearly all the Australian settlers have come from the British Isles, and the unity of the race has led to a peaceful growth. As in Britain, education has been encouraged, church schools now being replaced by practically free, compulsory education in public schools. There are colleges at the capitals, and two important universities. The English love of outdoor sports is fully maintained, and great skill is naturally developed in a climate where it is possible to practise cricket, football, tennis, and rowing all the year round.

Sheep Raising. — Although it was gold that brought population to Australia, her greatest wealth lies in her flocks of Merino sheep. Australian wool is the finest in the world. Sheep were first known in Asia, where doubtless they were originally wild animals; and the ancestors of the Merino were such as those tended by Jacob. From Asia the breed spread along the Mediterranean and found in Spain a favorable, dry climate. From this point flocks were taken to the early Dutch colony of South Africa and thence to Australia. The Merino sheep had for centuries been carefully tended in Europe and separated from coarse-wooled varieties; and when it was found that the climate and natural herbage of Australia really improved the quality of their wool, the British demand for that product led to a rapid development of the sheep-raising industry. It has now spread to the newly discovered pastures west of the mountains.

MAP QUESTIONS.—(1) Judging from the railways and cities, which is the be
settled part of Australia? (2) What part is least settled? (3) What reasons can y
suggest for these facts? (4) From the lakes and rivers, what do you infer concerning t
climate of the interior? (5) Trace the coast-line of Australia, noting the bays n
harbors. (6) How does Tasmania compare in area with Prince Edward Island? (7) Ma

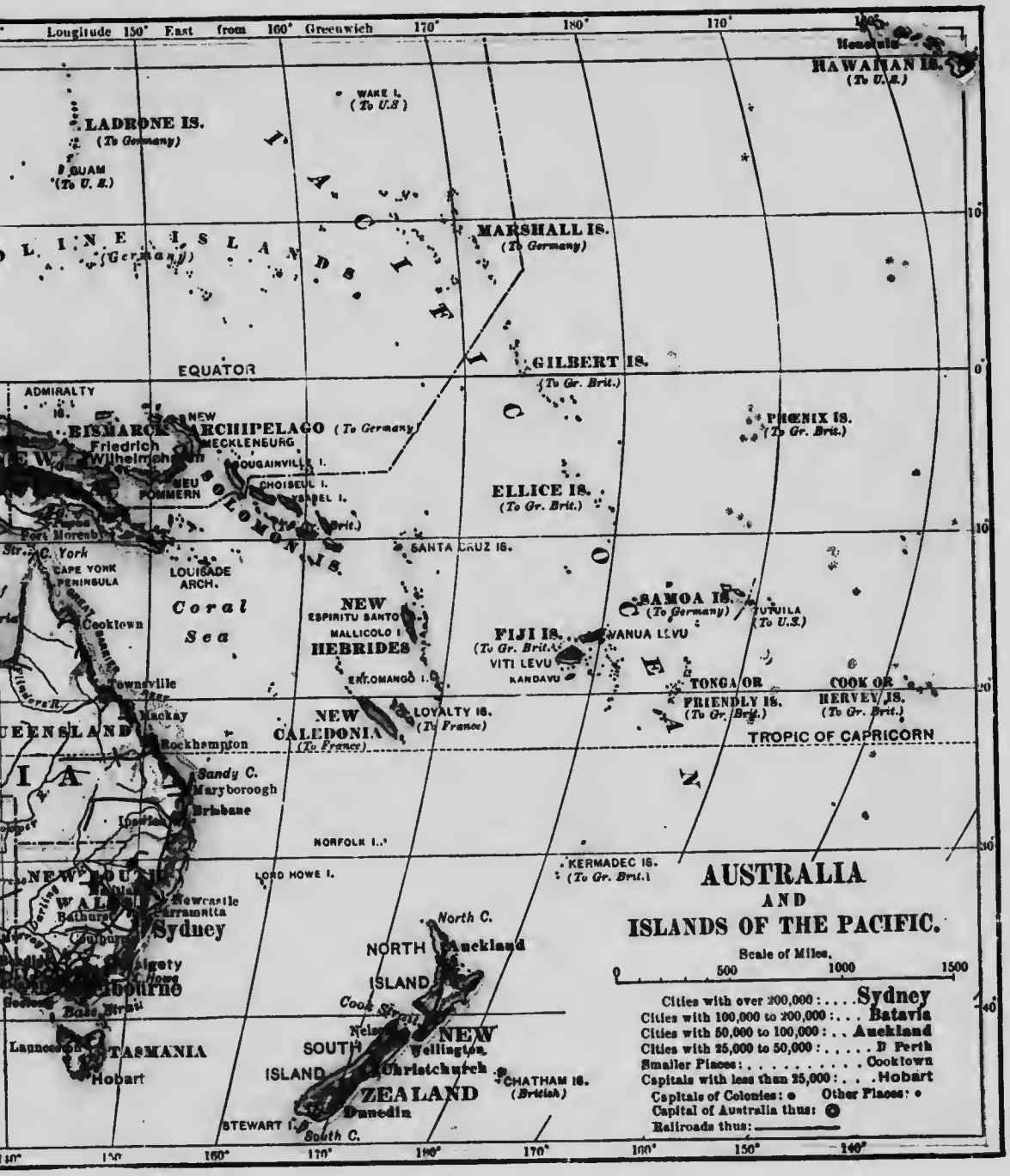


FIG. 385.

is the best-
sons can you
oncerning the
he bays and
nd? (7) Make a similar comparison with New Zealand. (8) Make a list of the island-groups belonging to Great Britain; to France; to Germany; to the Netherlands; to the United States. (9) What nations claim parts of Borneo? New Guinea? (10) Find the area of each of the islands and compare it with the area of your own Province.

In the early days of Australia the flocks were reared upon the unfenced government land, as in most new countries. The sheep were driven to pasture and water, and cared for at night by lonely shepherds, much as in the days of David. But now the land is largely fenced with wire, each sheep station having its own "*run*," or ranch. The largest ranches contain fully a hundred thousand sheep, and employ men enough to make a little village, with a store, a church, and a school. As in Argentina, each run is divided into sections, or "*paddocks*," by wire fencing, so that the sheep of different ages and conditions may be separated. The mildness of the climate makes it unnecessary to provide winter protection for the animals, and now that the wild dogs have been exterminated, the sheep no longer need much care from shepherds.

Animal Products. — To-day grazing is the characteristic and most important occupation in Australia. There are over a hundred million sheep, and fully half the exports consists of wool; but frozen or canned mutton and beef, together with tallow and hides, are also sent to Britain. Horses are bred for export, and cattle and swine are raised in large numbers. While the sheep graze in the arid interior, cattle are more numerous in the districts where there is heavier rain. Many cattle, especially near the coast, are raised for their dairy products, and butter is exported to Britain. At the season when the cows of Belgium and Denmark are stalled because of the cold, the dairy herds of New South Wales are feeding on fresh pastures. Explain the causes of the difference.

Farming. — Since agriculture secures a larger return from the soil than grazing, sheep have been driven from the damp lowlands and from those portions of the plateaus where the rainfall is sufficient for crops. Even in the interior there is farming where irrigation is found possible. In some cases water is supplied from streams; in others, from artesian wells.

Wheat is the most important crop aside from hay, and enough is raised to place Australia twelfth among lands raising this grain.

The farm products are distributed according to climate. For example, while oats and other hardy grains increase southward to Tasmania — since cold increases in that direction — corn is important only from New South Wales northward. There are large sugar plantations on the warm coast of Queensland; and in western Australia, where there are gold mines in the arid interior, much hay is raised for the animals employed at the mines.

All over Australia, fruits are an important product. They range from tropical varieties on the northern coast to oranges and other warm

temperate fruits southward, and finally, in the highlands and in Tasmania, to the orchard and small fruits of the cool temperate lands. In Victoria and South Australia, vineyards for the production of wine are of importance. Some of this fruit raising is carried on by the aid of irrigation, as for instance in the Murray River valley, where the water is supplied by the melting snows of the mountains. In what months would the snows melt there?

Mining. — The gold of Australia was first obtained from the gravels, and mines were later opened along the veins in the mountain rocks. Absence of water, however, has prevented hydraulic mining on a large scale, such as is carried on in British Columbia and in the western United States. Gold mining is still of great importance,

FIG. 387.
Sydney harbor.

Australia taking high rank among gold-producing nations. New deposits are discovered as the country is explored, the recent development of western Australia being largely due to such discoveries.

Copper mining greatly aided in the early development of South Australia, and rich copper mines are now worked in Tasmania. Silver and tin are other important mineral products. Coal is well distributed and of good quality. The best-developed field is near the coast of New South Wales, and some coal is exported. Rich iron ores, together with limestone, are found associated with these coal fields, and the mining and working of iron will follow the growth of the country.

Manufacturing. — Some wool is manufactured into cloth; some leather is tanned and made into shoes; and much flour is made from the wheat. There are sawmills and planing mills; and other forms of simple manu-

facturing are carried on. But for the most part the raw products of Australia are shipped abroad to be manufactured. Most of these products go to England, and the commonwealth depends upon the mother country for most of its manufactured articles. Australia is passing from the pastoral to the agricultural stage of her development, and the stage of extensive manufactures is yet to come.

Cities. — Australian cities have grown very rapidly, and one-third of the people live in the capitals of the six colonies. Favored as the seats of government and as seaports, and connected with the interior by government railways, these capitals have become the leading commercial centres. They are characterized by fine govern-

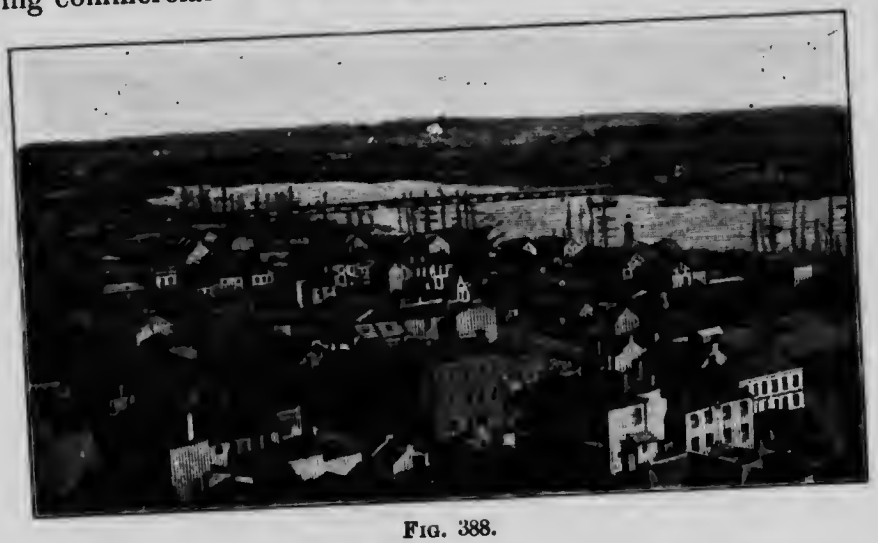


FIG. 388.

A view of a part of Sydney.

ment buildings and by abundant provision of parks and gardens for the people. Their large suburbs afford homes for the workingmen and save them from the crowded life in tenement houses.

MELBOURNE, the largest city in Australia and the capital of Victoria, is beautifully situated at the head of a broad harbor. SYDNEY, the capital of New South Wales, founded in 1788, and, therefore, the oldest city of Australia, is noted for its fine harbor (Figs. 387 and 388). At this point the coast faces deep water for a hundred miles; it consists of coves alternating with headlands and is dotted with fine residences set in park-like grounds. Both of these cities rank among the great seaports of the British Empire. ADELAIDE is a third large city. Of which division is it the capital? Name the other capitals.

Since nine-tenths of the Australians live on the coast lands, much of the commerce is carried on by means of steamboats, and most of the cities are seaports connected by rail with the interior farms, mines, and sheep country. A few mining centres, like BALLARAT and BENDIGO in Victoria, have become large towns. Ballarat owes its growth partly to its trade as the centre of a fine farming and grazing country.

ISLAND GROUPS

New Zealand. — More than a thousand miles southeast of Australia are the two large, mountainous islands of New Zealand. In the South Island there are great glaciers among the mountains, while in

FIG. 389.

A view in New Zealand.

the North Island there are active volcanoes, and also hot springs and geysers.

Since these islands lie in the course of the stormy westerlies, there is heavy rainfall on the western slopes. Therefore the mountains are clothed with forests of pine and other trees, with many kinds of ferns and tree-ferns beneath. On the lee or eastern slopes the rainfall is less, and the land is covered with wiry grasses.

In the south the crops are those of the cool temperate belt; but in the north the climate is mild enough for oranges. Can you suggest how ocean currents may influence the temperature of the north and south? What effect must the presence of water on all sides have upon the temperature?

New Zealand is so distant from other lands that few of the larger animals, except birds, have ever reached the islands. The native people, or *Maoris*, who must have come to the islands in boats, were a hardy,

warlike race, living in protected villages, amidst cultivated fields. Their opposition to newcomers delayed settlement by the British until a half-century after the founding of Sydney. They are now overpowered, and those that survive live mostly in the interior of the North Island. Many have so fully adopted civilized ways that they are allowed representatives in the legislature.

As in Australia, pastoral industries take the lead. There are twenty million sheep, and frozen mutton and wool are exported to England. Cattle are likewise kept, and butter is exported. Agriculture is important, especially in the districts of fertile volcanic soils on the North Island; but much land that is suited to farming has never been cleared of forest. There are both gold and coal mines among the mountains; and from their slopes are obtained valuable timber and a gum used for varnishes. Manufacturing is only slightly developed, and is chiefly for home use.

Although the industries and life of this English colony resemble those in Australia, its interests are so different that they have prevented its joining the Australian federation — just as the island colony of Newfoundland has declined to join the Dominion of Canada. The situation of these islands in the temperate zone is favorable to rapid progress; and the vigorous immigrants from the British Isles have developed the resources wonderfully, and have established one of the best governments in the world.

Many short lines of railway connect the settled interior with the seaports; roads and stage lines extend to the more distant districts; and steamers ply around the coasts and to distant countries. There are four prominent cities of nearly the same size, the smallest of which is WELLINGTON, the capital, and the largest, AUCKLAND, about as large as London in Ontario.

The East Indies. — Between Asia and Australia are hundreds of islands, some very large, others so small that they find no place on our map. Of these the great majority have animals, plants, and people of Asiatic origin. New Guinea, however, which is nearest to Australia, bears a resemblance not to Asia but to Australia. It is, therefore, usually considered a part of Australasia, while the islands to the west and northwest are classed with Asia.

New Guinea, north of Australia, is one of the largest islands in the world, having an area a little larger than that of Ontario. Although three times the size of New Zealand, it contains a smaller population, composed mainly of savages (Figs. 390 and 392). This difference is due to its position in the torrid zone. The heavy tropical rainfall has clothed most of its surface with dense forests, so that the high mountain ranges and the unhealthful lowlands of the interior are almost unknown.

While the islands farther west are overrun with Malays from Asia, the natives of New Guinea resemble the native Australians. The animal life also resembles that of Australia, a fact indicating that this island, like Australia, has long been separated from Asia. Former connection with Australia is further indicated by the fact that the two are now separated only by a shallow sea.

Fig. 390.
Houses in the trees in New Guinea.

The three nations that claim New Guinea maintain only trading stations on the coast; and the tropical forests, the fertile soils, and the minerals are yet to be utilized.

The East Indies proper also have a tropical climate, and are clothed with dense forests in which the elephant and rhinoceros, as well as other Asiatic animals, are still found. Most of the natives are Mohammedan Malays from Asia, but some of them are pagans.

The *Philippine Islands*, which belong to the United States, are really a northern extension of the East Indies. They consist of several thousand separate islands, many of which are very small. The two largest are Luzon and Mindanao. Owing to the tropical warmth and dampness and to the excellent soil, the uncultivated parts of the islands are covered with a dense tropical forest, containing many valuable woods. The inhabitants number from eight to ten millions, only about one-half of whom are at all civilized. Coffee, cocoa, sugar, and tobacco

Fig. 391.
Philippine boats, really logs with centres dug out.

are raised for export. Other products are hemp, castor-bean oil, rattan, and bamboo. There are a number of towns on these islands having more than ten thousand inhabitants, but the largest city is MANILA, on the island of Luzon. Manila is about the same size as Montreal.

Many of the other islands of this region, including Sumatra, Java, the Celebes, and a large part of Borneo and New Guinea, are *Dutch colonies*. What nation controls the island of Timor? To

FIG. 392.

A New Guinea village built in the water for protection against enemies.

which nation does northern Borneo belong? Borneo, with almost as great an area as that of the province of Quebec, is one of the largest islands in the world. The immense size of these islands is indicated by the fact that Sumatra is over twice the size of Manitoba, while Java has an area nearly twice as great as that of New Brunswick.

All of the larger islands are mountainous; in fact, they are parts of mountain ranges rising out of the sea, and among them are many active volcanoes, some of which have had terribly destructive eruptions. There are lowlands near the coasts, and many coral reefs skirting them. Indeed, a large number of the smaller islands are merely coral reefs slightly elevated above the ocean.

Since they are so near the equator, and therefore have a heavy rainfall, these islands have tropical products. The forests supply valuable woods and gums, including gutta-percha and camphor. Large areas, especially in Java, are highly cultivated and produce quantities of rice,

sugar-cane, and coffee. In the production of the last two articles Java is one of the leading regions of the world. Among the noted products of the East Indies are spices, such as pepper, cloves, and nutmegs; in fact, one of the island groups is known as the Spice Islands. What is the other name? There are also valuable minerals, including tin, gold, and precious stones.

FIG. 393.
A native house in the Friendly (Tonga) Islands.

The Dutch have been remarkably successful in managing their East Indian colonies, which are a source of great wealth; yet the larger islands are so mountainous, and the forests so dense, that great areas are scarcely known. The Dutch East Indies are fifty times as large as the Netherlands and have seven times as many inhabitants.

The largest city among these islands is Manila, in the Philippines; and next in size is BATAVIA, the centre of the Dutch colonial government.

Islands of the Pacific. — The map (Fig. 329) shows the western Pacific dotted with island groups; but these islands are so small that, although there are many hundreds of them, their combined areas are little more than half that of New Zealand. They are the higher peaks of great mountain folds rising from the ocean floor. Many of them are volcanoes, others submerged peaks upon which corals have grown and formed coral islands.

FIG. 394.
A native village in the Fiji Islands.

What names among them have you heard before? To what nations do the groups belong? Although under the control of these foreign nations, the local government is usually administered by native chiefs.

Together these islands have a population of less than a million; but the natives have been decreasing in numbers, partly because of drunken-

ness and disease following contact with Europeans. Although missionaries have converted many to Christianity, others remain savages, and some practise cannibalism. They are the best sailors of all the uncivilized races, and in past centuries reached the islands in boats from Asia, going from group to group.

There is a marked difference between life on the "low" or coral, and that on the "high," or volcanic, islands. Volcanic islands, like Fiji, the peaks of which rise several thousand feet, are heavily forested on their rainy, windward slopes; and their fertile soil encourages agriculture. The coffee plant and sugar-cane are extensively cultivated, and bananas and pineapples are raised for home consumption and for export.

On the low coral islands, on the other hand, the cocoa palm is the mainstay of human life, supplying food, clothing, shelter, boats, many utensils, and the means of trade as well. *Copra*, the main export from Samoa and from many of the Pacific islands, is the dried meat of the cocoanut, of value for its oil and as food.

REVIEW QUESTIONS. — *Australia.* (1) What about its position, area, and population? (2) Where are the mountains? (3) What resemblance is there to North America? (4) How do the streams vary in the several sections? (5) What is the nature of the coast? (6) Tell about the Great Barrier Reef. (7) How does the rainfall vary in the different parts of Australia? Give the reasons. (8) What differences in plant life are thus caused? (9) What is the influence on industries? (10) Mention some of the ways in which the plants are adapted to their surroundings. (11) Tell about the forests. (12) Tell about the natives. (13) Give reasons why Australia was not settled earlier. (14) What finally led to rapid settlement and development? (15) Tell about the government. (16) Tell about sheep raising: the Merino sheep; introduction to Australia; development of the industry; care of the sheep. (17) What are the animal products? (18) Tell about farming: water for irrigation; principal products; variation in crops according to climate. (19) What mineral products are found? (20) What is the condition of manufacturing? (21) Why are the capitals so important? (22) Name and locate the three largest cities: what can you tell about each? (23) What about other towns?

Island Groups. (24) Tell about New Zealand: its surface features; climate; native animals and people; leading industries; development; cities. (25) Tell about New Guinea: size; position; climate; people; animals; resemblance to Australia; resources. (26) What about the animals, plants, and people of the East Indies? (27) To what nations do the islands belong? (28) What about their size? (29) Tell about their physiography, climate, and products. (30) What about the success of the Dutch in the East Indies and the extent of their possessions there? (31) Tell what you can about the Philippine Islands. (32) Tell about the small island groups: their names; position; origin; government; people: products.

SUGGESTIONS. — (1) If it were within your power, how would you arrange the highlands of Australia so as to secure the most even distribution of rain? (2) Estimate the greatest length of New Zealand. (3) Estimate the distance from Batavia to Manila. (4) Write your impression of the climate of Melbourne in January; in July. (5) Through some fruit dealer obtain a cocoanut in its

husk and examine it. (6) Read Whittier's poem on the Palm Tree. (7) Learn something about the work of missionaries in the small Pacific islands. (8) Collect pictures for the school, showing the islands and their life. (9) By what routes can one go from St. John to Australia? Through what waters? Which would be the shortest? About how many miles? (10) Answer the same questions for a voyage from Victoria to Manila.

Part VI

THE BRITISH EMPIRE [1]

[See Map on Page 295.]

Growth and Extent of the Empire. — From the earliest times the inhabitants of the British Isles, whether English, Irish, Scots, or Welsh, have been of a roving disposition. They have not been content to stay at home within their own little islands, but have gone abroad and have carried with them the flag of their country. From the time of Elizabeth, when the first permanent work in the way of exploration and colonization was done, to the present day, the mission of the British people seems to have been to explore unknown seas and trackless wildernesses, to make the land fruitful where nothing was produced, and to carry civilization and freedom to even the darkest places of the earth. From small beginnings the British Empire has spread, until to-day it stands first among the nations of the world, first in area and population, first in wealth and power. Its dominions include over one-fifth of the land surface of the globe; its inhabitants make up one-fourth of the total number of people in the world.

The area of the British Empire at the present time is 11,516,821 square miles and its population is estimated at 394,553,581. Of this enormous territory a considerable part is unexplored, and the vast resources of a still greater part have not yet even begun to be developed. There are millions of acres in western Canada awaiting the plough of the farmer to turn them into vast wheat-producing fields. Other parts of Canada are extraordinarily rich in minerals as yet almost untouched. British Central and South Africa have almost incalculable resources in the way of mineral, forest, and agricultural products. Australia is only beginning to develop its wonderful natural resources, while India is advancing more rapidly in commerce and manufactures than ever before. The British Isles them-

[1] In connection with the study of the British Empire, the student is strongly recommended to use either one of two books: "Handy Atlas of the British Empire," by J. G. Bartholemew, F.R.G.S., published by George Newnes, Limited, London, or "Historical and Modern Atlas of the British Empire," by G. Grant Robertson, M.A., and J. G. Bartholemew, F.R.G.S., published by Methuen & Co., London. These are exceilent books and invaluable to the student.

selves still retain their supremacy as a great manufacturing country, in spite of the keenest of competition from the United States and Germany. Yearly the Empire is increasing its manufactures, developing its mines, cultivating its wheat, cotton, sugar, rice, and tobacco fields, until there seems to be no limit to the advance that may be made. Before many years the Empire should be self-sustaining, that is, if necessity requires, can maintain itself by trade within its own bounds in food products, raw material, and finished articles, without regard to the remainder of the world.

Of the whole population of the Empire only about 60,000,000 are of British birth. This imposes upon the Empire a great obligation, which is being faithfully met. Everywhere that the British people have gone the benefits of civilization have followed. The subject nations have been governed for the uplifting of the people themselves; their laws and customs in all cases have been respected except where it has been found necessary, for the sake of humanity, to put down some barbarous custom.

Trade and Commerce. — The trade of the British Empire, during the year 1905, reached the enormous sum of over eight billions of dollars. In order to carry on this trade, the greatest merchant marine in the world is employed. The vessels belonging to the Empire number over 40,000, and have a tonnage of over 10,000,000 of tons, the United States being next with a tonnage of less than 5,000,000 and the Netherlands third with about 2,000,000. The importance of this merchant marine can scarcely be overestimated to an Empire so widely scattered, with its centre small and in an insular position. *See Pages 294–296.*

A large part of the trade of the Empire is within its own bounds. Great Britain sends to the other parts of the Empire manufactured articles, and these countries in return send to the mother-country food stuffs, raw materials, and certain manufactured articles, for the most part not produced in the British Isles. The larger self-governing colonies have the right to tax all articles coming into the country, whether from Great Britain or any of the other colonies, and this right is exercised, but in spite of this the volume of trade is with the mother-country.

Communication within the Empire. — Every part of the British Empire is connected with the mother-country by means of steamship lines, aided in some cases by the railways, and communication is regularly maintained. The most important trade routes within the Empire are as follows : —

(1) From the British Isles across the Atlantic Ocean to Canada.
(2) From the British Isles across the Atlantic to Canada, across

Canada by railway, and thence by steamship across the Pacific to Hong Kong, India, or Australia.

(3) From the British Isles, through the Mediterranean Sea, Suez Canal, Red Sea, and Indian Ocean to India or Australia.

(4) From the British Isles, through the Atlantic Ocean, round the Cape of Good Hope, and across the Indian Ocean to India or Australia.

(5) From the British Isles, through the Atlantic Ocean, round Cape Horn, and through the Pacific to British Columbia, Hong Kong, or Australia.

(6) From the British Isles to the West Indies.

(7) From Canada to the West Indies.

Cable communication is also maintained with many parts of the Empire, particularly with Canada, Australia, India, South Africa, and the West Indies. Indeed, since the opening, in 1902, of the cable between Canada and Australia, a portion of the expense of which was borne by Great Britain, it is now possible to send a message around the world by cables touching only on British soil.

Protection of Commerce. — The government of Great Britain, in order to protect her commerce and that of her colonies, maintains a large and powerful navy. This is all the more necessary as Great Britain, being an insular power with a small home territory, is dependent upon the outside world for her food supply and for the raw material of her manufactures, and must pay for these supplies by means of articles manufactured within the Islands. This navy, primarily intended for protection and defence, is kept up by Great Britain herself, without in any way drawing upon the resources of the other parts of the Empire, although some of the colonies contribute to the cost of maintenance, but this contribution is purely voluntary.

The greater part of the navy is kept in home waters or near at hand for the protection of the British Isles, but a large part is scattered in squadrons and single ships throughout the Empire. In order that the navy may be kept up to the highest state of efficiency, abundant coaling stations are provided, and docks where the ships may be overhauled and repaired. These stations are situated at convenient points, so that a British warship may steam round the world, and without any inconvenience coal only from stations owned by Great Britain and from coal obtained within the Empire. Some of these stations, such as Gibraltar, Malta, Aden, and Hong Kong, are very strongly fortified and garrisoned. There is not a quarter of the world where a British ship may not find splendid harborage and facilities for repairing and coaling. Halifax and Esquimault, in Canada, have dry-docks and are strongly protected, but they are garrisoned by Canadian and not by Imperial troops.

Government.— Since the American Revolution, which resulted in the loss of the thirteen American colonies, the policy of Great Britain has been to allow to the colonies the utmost freedom in matters of government. Some of the larger colonies, such as Canada, Australia, Cape Colony, and Newfoundland, have almost complete self-government, the only restraint being in connection with matters that concern the Empire as a whole. Others, such as Jamaica and British Honduras, have a partial self-government, but even in these the interference of the home government is seldom felt. Others are governed as Crown Colonies, administered by a Governor or Commissioner, who has full authority under the Crown. Others are governed directly either by the Foreign Office or by the Admiralty. In a few cases the administration of government is in the hands of a chartered company, who have full authority under the Crown. Certain large territories are under a protectorate, the government being administered in each case in a manner most convenient and best suited to the needs of the country. The aim of the Imperial government in all cases is to govern in such a way as to secure the greatest benefit for the country and the people governed.

The Constituent Parts of the Empire.— The British Empire is scattered through every section of the world. A brief statement in regard to the various parts is here given, including the area and population, the nature of its surface, the principal exports and the form of government.

The British Empire in Europe

Great Britain and Ireland.— The total area of Great Britain and Ireland, including the various islands off the coast, is 121,027 square miles and the population 42,372,556. *See Pages 279–298.*

Gibraltar.— A very strong fortress, port, and coaling station in southern Spain, at the entrance to the Mediterranean. The peninsula is about $2\frac{3}{4}$ miles long and $\frac{3}{4}$ of a mile broad, with an area of 2 square miles. The population, including its garrison, is 27,460. With the exception of a sandy plain to the north, the greater part of the peninsula is about 1450 feet above the sea level. Gibraltar is a Crown Colony under a military governor.

Malta.— An island in the Mediterranean Sea, about 58 miles from Sicily. It is 17 miles long, 9 miles broad, with an area of 92 square miles. Including the small islands of *Gozo* and *Comino*, the total area is 117 square miles and the population 188,141. Malta is the principal naval station of Great Britain on the Mediterranean Sea, is strongly fortified, and has a permanent garrison of 12,000 men. The principal industries are the rais-

ing of cattle, sheep, and goats, and the growing of cotton, potatoes, oranges, and onions. The capital is VALETTA, which has a population of 64,000. Malta is a Crown Colony.

THE BRITISH EMPIRE IN ASIA

Cyprus.—An island in the Levant, about 60 miles from the coast of Asia Minor. It is 140 miles long, from 40 to 60 miles wide, with an area of 3584 square miles and a population of 237,022. The surface is somewhat mountainous. The principal exports are oranges, lemons, wine, raisins, tobacco, cotton, sponges, wool, and hides. The capital is NICOSIA, with a population of 14,752. Cyprus nominally belongs to Turkey, but is administered as a Crown Colony of Great Britain.

The Indian Empire.—The whole of the Indian peninsula south of the Himalayas, with the exception of Nepal and Bhutan, is either directly under British rule or is dependent upon Great Britain. The territory under the Governor-General of India includes also *Burma*, the *Andaman* and *Nicobar Islands*, *Baluchistan*, and *Aden*. The area of the Indian Empire is estimated at 1,766,797 square miles, and the population at 294,360,356. *See Pages 393–400.*

Burma.—One of the provinces of the Indian Empire in Farther India. It is 1100 miles in length and 700 miles in breadth, with an area of 236,738 square miles, and a population of 10,490,624. The surface is mountainous and covered with vast forests. The principal exports are rice, cotton, teak, bamboo, and petroleum. The capital is RANGOON, with a population of 234,881. Burma is administered by the government of India.

Baluchistan.—A country lying along the Arabian Sea, a portion of which belongs to Great Britain. The British portion has an area of 45,804 square miles and a population of 308,246. The chief products are wool, wheat, and hides. The country is governed by an Agent for the Governor-General of India.

Andaman Islands.—A group of islands in the Bay of Bengal. The area of the group is 2551 square miles and the population 18,339. The surface is mountainous and covered with forest. The chief exports are timber and cocoanuts. The capital, PORT BLAIR, is a penal settlement. The islands are under the control of the government of India.

Nicobar Islands.—A group of islands 14 in number, about 75 miles south of the Andaman group. The area of the islands is 637 square miles, and the population 6310. The surface is covered with forest growth. The principal exports are timber and cocoanuts. The capital is NANCOWRY. The islands are under the control of the government of India.

Aden.—A strongly fortified coaling station at the southern extremity of Arabia. It contains 80 square miles and has a population of 43,974. It is an important trade centre. The principal exports are coffee, gums, spices, ivory, and pearls. The islands of *Socotra*, *Perim*, and the *Kuria Muria Islands*

are attached to Aden, which is under the control of the government of India. Socotra has an area of 1382 square miles and a population of about 12,000.

Bahrein Islands.— A group of islands in the Persian Gulf near the coast of Arabia. The area of the islands is 250 square miles and the population about 70,000. The principal island, Bahrein, is 30 miles long and 10 miles wide. The chief exports are pearls, cotton, dates, coffee, and grain. The capital is MOHAREK. The Bahrein Islands are a protectorate of Great Britain.

Laccadive Islands. — A small group of islands 14 in number, about 200 miles west of Madras. The area of the islands is 216 square miles and the population 15,000. The principal product is cocoanut fibre. The Laccadive Islands are under the government of India.

Ceylon. — A large island at the southern extremity of the Indian peninsula. The island is 266 miles long, and at its widest part 145 miles broad. The area is 25,365 square miles and the population 3,565,954. Coal, iron, and plumbago are extensively mined. Pearl fishing is one of the chief industries. The principal exports are coffee, spices, tobacco, cocoanuts, rubber, camphor, and rice. The capital is COLOMBO, with a population of 158,288. TRINCOMALI, on the east coast, is the headquarters of the British East Indian fleet. Ceylon is a Crown Colony.

Maldive Islands. — A chain of about 250 small islands, extending nearly 500 miles in length, with an average width of 50 miles. The area of the islands is about 115 square miles and the population 30,000. The principal products are fruit and nuts. The Maldive Islands are dependencies of Ceylon.

Straits Settlements. — A colony in southeastern Asia, including *Singapore*, *Penang*, *Malacca*, *Cosos-Keeling Islands*, *Christmas Island*, and a protectorate over a number of native states on the southern half of the Malay Peninsula. The area of the Straits Settlement proper is 1472 square miles and the population 572,249. The principal products are gutta-percha and rubber, rice, spices, gums, tobacco, coffee, tea, and opium. The capital is SINGAPORE, a very important trade and shipping centre. The Straits Settlements form a Crown Colony.

Hong Kong. — An island on the south coast of China, near the entrance to the Canton River. It is 11 miles long, 2 to 5 miles broad, and has an area of 30 square miles. The surface is very rocky and mountainous. Hong Kong is important principally as a centre for the Chinese trade, the chief exports being tea, hemp, and silk. The Crown Colony includes, in addition to Hong Kong, *Lantao Island*, the *Lema Islands*, and the peninsula of *Kowloon* on the mainland. The area of the whole colony is 406 square miles and the population 399,992. The capital is VICTORIA, a strongly fortified military and naval station, with an excellent harbor.

Malay States. — The Malay states of *Perak*, *Selangor*, *Negri Sembilan*, and *Pahang* on the west coast of the Malay Peninsula are governed by the Commissioner for the Straits Settlements. The area of the states is 26,960

square miles and the population 735,000. The surface along the coast is flat, but the interior is mountainous. Gold, tin, and lead are mined. The chief exports are coffee, rubber, tapioca, rice, spices, and sugar. The state of *Johore*, in the extreme south of the peninsula, is also under British protection. The area of Johore is 7000 square miles and its population about 200,000.

British North Borneo. — A territory at the north-east of the island of Borneo. Its area is 34,000 square miles and its population about 200,000. The coast is flat, but the interior is mountainous. The chief exports are tobacco, spices, rubber, coffee, sago, and camphor. The capital is SANDAKAN. The country is governed by the British North Borneo Company.

Brunei. — A native state in the northern part of Borneo. Its area is 8100 square miles and its population 50,000. The interior is mountainous. The chief exports are sago and spices. Brunei is a protectorate under the Governor of the Straits Settlements.

Sarawak. — A territory on the north coast of Borneo. Its area is 39,850 square miles and its population about 600,000. The interior is mountainous. Gold is mined somewhat extensively. Spices are the principal export. Sarawak is a protectorate under the Governor of the Straits Settlements.

Labuan. — An island off the coast of Borneo. Its area is 30 square miles and its population 8411. It produces considerable coal. The chief exports are sago, camphor, rubber, tortoise-shell, and gutta-percha. The capital, VICTORIA, has an excellent harbor. Labuan is administered by the British North Borneo Company.

Wei-hai-wei. — A territory in north-eastern China on the Shantung Peninsula, leased to Great Britain for as long a period as Russia should hold Port Arthur. It comprises a number of islands and a strip of land 10 miles wide along the bay, the total area being 285 square miles, with a population of 124,000. The surface is very hilly. The principal exports are salt fish, beans, and raw silk. The town of WEI-HAI-WEI, which is a British naval base, has about 2000 inhabitants. The territory is administered by the Admiralty.

THE BRITISH EMPIRE IN AFRICA

Egypt. — Although Egypt is nominally dependent upon the Sultan of Turkey and is governed by the Khedive, an hereditary monarch, yet it is in reality a part of the British Empire. Great Britain, through its Agent and Consul-General, exercises a virtual protectorate not only over Egypt, but over practically the whole of the Libyan Desert to the south, a territory of over 400,000 square miles. *See Pages 421–426.* The Sirdar or Commander-in-Chief of the Egyptian army and most of the officers are British, and in addition there is a British force of 6000 men in the country. Under British rule Egypt has made extremely rapid progress during the past few years.

Gambia.— A colony in western Africa. With adjacent territory under British control the area is about 4500 square miles and the population 77,000. The country is low and swampy, but fairly healthy. The principal exports are ground nuts, rubber, palm oil and kernels, wax, and hides. The capital is BATHURST, with a population of 9000. Gambia is a Crown Colony.

Sierra Leone. — A colony in western Africa. Attached to Sierra Leone is a large protectorate, the area of the whole being about 34,000 square miles with a population of 1,127,000. The surface is in some places marshy, in others quite uneven and mountainous. The principal exports are palm-oil and kernels, ground nuts, india rubber, ginger, and hides. The cotton crop promises to be an important one. The capital, FREETOWN, with a population of 29,000, has an excellent harbor. Sierra Leone is a Crown Colony.

Lagos. — A colony on the west coast of Africa, including a section of the mainland, the island of Lagos, and a protectorate behind. The colony extends about 160 miles along the coast and has an area of 27,000 square miles. The population is about 1,500,000. The country is somewhat marshy, especially along the coast line. The principal exports are palm-oil and kernels, rubber, and mahogany. Cotton and sugar are being successfully grown. The capital is LAGOS, with a population of 42,000. Lagos is a Crown Colony.

Gold Coast. — A colony extending 350 miles along the Gulf of Guinea. The area is 40,000 square miles and the population about 1,500,000. The coast lands are flat and marshy, while the interior is covered with a tangled forest growth. The principal exports are palm-oil and kernels, cola nuts, cocoa, mahogany, and other timbers. Considerable gold is mined. The capital is ACCRA, with a population of 16,500. The Gold Coast is a Crown Colony.

Somaliland. — A district in East Africa, south of the Gulf of Aden, and extending along the coast of the Indian Ocean. The area is about 60,000 square miles and the population 153,000. The country is very mountainous and there is a great deal of desert. The principal exports are gums and resins, cattle, skins, butter, and ostrich feathers. The capital, BERBERA, has an excellent harbor. The government is administered directly by the Foreign Office at London.

Nigeria. — A protectorate on the Gulf of Guinea. The area is about 380,000 square miles and the population is estimated at 20,000,000. The coast line is low and marshy, but the interior is somewhat mountainous and covered with forest. Silver, lead, tin, and antimony are found, but the mines are as yet undeveloped. The principal exports are palm-oil and kernels, rubber, hides, leather, indigo, ivory, cotton, and valuable timbers. The capital is OLD CALABAR. The government is administered by a High Commissioner.

Zanzibar. — A protectorate, including the island of Zanzibar, on the eastern coast of Africa. It extends for 47 miles along the coast and has an area of 1020 square miles. The population is estimated at 200,000.

The soil is very fertile. The principal exports are wax, hides, rubber, ebony, cloves, and tortoise-shell. The principal port is ZANZIBAR, with a population of 50,000. The government is administered by a resident Political Agent under the British Foreign Office.

East Africa. — A protectorate in eastern Africa, lying on both sides of the equator. The area is about 280,000 square miles, with an estimated population of 4,000,000. The surface is part of the great plateau and is tropical throughout. The resources of the country have as yet been little developed, but as the district is healthful for Europeans, an extraordinary growth may be looked for in the near future. The principal exports at present are ivory, rubber, hides, and horns. The capital, MOMBASA, with a population of 20,000, has an excellent harbor. The government is administered by a Commissioner under the Foreign Office at London.

Uganda. — A protectorate in East Africa, administered in connection with the British East Africa protectorate. The area is about 150,000 square miles and the population is estimated at 4,000,000, of whom about 300 are Europeans. The surface is a plateau covered in the north with dense forests. Iron and copper are found, but as yet are not extensively mined. The resources of the country are only being developed. The chief exports are ivory, timber, cattle, hides, and gum.

Central Africa. — A protectorate in Central Africa. Its area is 42,217 square miles, with an estimated population of 900,000. The surface is diversified by lakes and rivers. The principal exports are coffee, rubber, rice, tobacco, ivory, and oil seeds. The chief town is BLANTYRE, with a population of 6000. The government is administered by a Commissioner under the Foreign Office at London.

Rhodesia. — A colony in Africa, named after the late Cecil Rhodes. The area is about 750,000 square miles and the estimated population 1,000,000. The surface is part of the great plateau, and is from 3000 to 6000 feet above sea level. The Cape to Cairo Railway runs through Rhodesia. Coal, gold, iron, copper, lead, zinc, and salt are extensively mined. Indian corn, tobacco, rubber, and indigo are being grown to advantage. Rhodesia has only lately attracted the attention of Europeans, and its magnificent resources are as yet almost in their infancy. The principal towns are BULAWAYO and SALISBURY. The government is administered by the British South Africa Company.

Bechuanaland. — A protectorate in South Africa. The area is 380,000 square miles, with a population of 120,000. The surface is part of the central plain of Africa and is from 4000 to 5000 feet above the sea level. The raising of cattle, sheep, and goats is the principal occupation, although more and more attention is being paid to the raising of Indian corn. Some gold is mined. The government is administered by a resident Commissioner.

The Cape of Good Hope. — A colony at the southern extremity of Africa. It is about 800 miles from north to south, and 860 miles in width at its widest part. Its area is 276,955 square miles and the population

2,404,878. *See Pages 428–432.* The Cape of Good Hope includes also *East Griqualand, Tembuland, Pondoland, Transkei,* and *Walfisch Bay.* Diamonds, copper, coal, and zinc are extensively mined. Cattle, sheep, goats, and ostriches are raised, and Indian corn, wheat, and barley are grown. The capital is CAPE TOWN. Cape Colony has responsible self-government.

Natal. — A colony in South Africa, bordering on the Indian Ocean. Its length is about 260 miles, with an extreme width of about 190 miles. Its area is 36,170 square miles and its population 1,040,000. *See Pages 428–432.* Cattle, goats, sheep, and horses are raised, and also excellent crops of wheat and Indian corn. Coal, iron, and copper are extensively mined. Along the coast, sugar, tea, tobacco, and coffee are grown. The principal exports at present are wool, hides, coffee, and bark. The manufactures of the colony are steadily growing. The capital is DURBAN. Natal has responsible self-government.

Basutoland. — A Crown Colony in South Africa. Its area is 10,023 square miles and its population about 350,000. The surface is about 5000 feet above the sea level and forms part of the great plateau. Indian corn and wheat are grown, and cattle, sheep, and goats are raised. The colony is governed by a resident Commissioner under the High Commissioner for South Africa.

Transvaal. — A colony in South Africa. Its length is 400 miles, its width at its widest part 700 miles, and its area 11,700 square miles. The population is about 1,000,000. *See Pages 428–432.* The colony is extremely rich in minerals; gold, iron, and coal are the most important. Diamonds, silver, zinc, lead, copper, and quicksilver are also extensively mined. Cattle are raised, and Indian corn and wheat grown. Ostrich feathers and ivory are also exported. The capital is PRETORIA. The colony, under the control of the High Commissioner for South Africa, has a partial self-government.

Orange River Colony. — A colony in South Africa. Its length is about 350 miles and its breadth about 180 miles. Its area is about 50,000 square miles, with a population of 585,000. *See Pages 428–432.* Diamonds, coal, gold, and iron are extensively mined. Cattle, sheep, and horses are raised and considerable grain grown. The principal exports, other than minerals, are ostrich feathers, wool, skins, and hides. The principal city is BLOEMFONTEIN. For the present the government of the Orange River Colony is administered by the High Commissioner for South Africa.

Walfisch Bay. — A small territory with an area of 430 square miles and a population of 768, on the coast of German Southwest Africa. It is a dependency of the Cape of Good Hope.

Mauritius. — An island in the Indian Ocean about 550 miles from Madagascar. It is about 36 miles long and 28 miles wide. The island is of volcanic origin and is surrounded by coral reefs. The principal exports are sugar, spices, tobacco, molasses, vanilla, and cocoanut oil. The capital is PORT LOUIS, with a population of 54,000. Attached to Mauritius,

which is governed as a Crown Colony, are the *Chagos Islands, St. Brandon,* and *Rodrigues.* The area of all the islands is about 729 miles and the population 378,195.

Seychelles. — A group of islands, 74 in number, in the Indian Ocean, about 1000 miles from the African coast. The total area of the islands is about 148 square miles and the population 19,237. Mahé, 17 miles long and 4 to 6 miles broad, is the largest of the islands, and on it is situated PORT VICTORIA, the capital of the group. The surface of all the islands is mountainous. The principal exports are vanilla, cloves, tortoise-shell, coffee, and pearls. Rubber and tobacco are being cultivated. The Seychelles, including the *Amirante* and *Aldakra Islands,* form a Crown Colony.

St. Helena. — An island in the South Atlantic Ocean about 1700 miles from Cape Town. It is 10½ miles long, 6½ miles wide, with an area of 47 square miles and a population of 3342. The island is surrounded by high cliffs and the surface is very mountainous. The principal industries are fishing and the cultivation of potatoes. The principal town is JAMESTOWN. St. Helena is a Crown Colony.

Ascension. — An island in the South Atlantic, 700 miles north-west of St. Helena. Its area is 35 square miles and its population 400. Ascension is a naval station under the control of the Admiralty.

Tristan da Cunha. — A group of islands in the South Atlantic. The area of the four islands is 45 square miles and the population, 75 in number, are shipwrecked sailors and their families. They cultivate only sufficient for their own needs. A ship of war visits the island each year. The islands have no government.

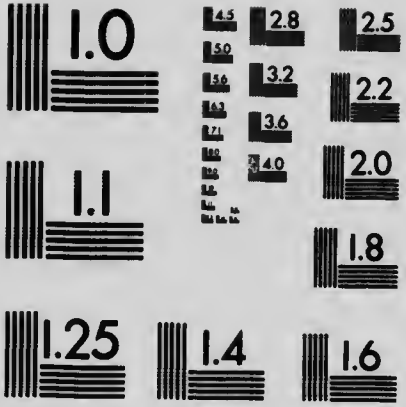
THE BRITISH EMPIRE IN AMERICA

Canada. — The Dominion of Canada consists of nine provinces, — Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Manitoba, Alberta, Saskatchewan, and British Columbia — one organized territory, Yukon, and its unorganized North-West Territories. Its area is 3,744,695 square miles and its population, according to the last census, 5,390,740. *See Pages 91–192.*

Newfoundland. — An island in the Gulf of St. Lawrence. Its area is 40,200 square miles and its population 217,037. The island is self-governing and includes Labrador. *See Pages 193–198.*

British Honduras. — A colony on the east coast of Central America. Its area is 7562 square miles and its population 37,479. The country is mountainous in the southern part, but flat and swampy toward the north. The chief exports are mahogany, rosewood, sugar, coffee, sarsaparilla, bananas, oranges, pineapples, rubber, and tortoise-shell. The capital is BELIZE, with a population of 9613. British Honduras is a Crown Colony.

Bahama Islands. — A chain of coral islands, 600 miles in length, extending from Florida to Haiti. There are in the group 29 large islands and 660 smaller ones, but only about 20 are inhabited. The principal



islands are New Providence, Abaco, Harbor, Great Bahama, San Salvador, and Long Island. The area is 4004 square miles and the population 53,735. The chief exports are maize, cotton, fruits, nuts, and sponges. The capital is NASSAU. The Bahama Islands form a Crown Colony.

Bermuda Islands. — A group of islands in the North Atlantic, 580 miles from the coast of North America. The area of the group is 19 square miles and the population 17,535. Only about 20 of the islands are inhabited. The principal exports are lilies and garden vegetables. There is a naval station and a pontoon floating dock in the islands. The capital is HAMILTON. The islands are under the control of the Admiralty. *See Page 244.*

Jamaica. — An island in the Caribbean Sea, 90 miles from Cuba. It is 144 miles long, with an extreme breadth of 50 miles. Its area is 4,193 square miles and its population 766,566. *See Page 242.* The principal exports are timber, fruits, coffee, ginger, cocoa, cinchona, sugar, and rum. The capital, KINGSTON, is an important coaling station. The *Turk's* and *Caicos Islands*, the *Cayman Islands*, and a number of smaller groups are dependencies of Jamaica. The Turk's and Caicos Islands have a total area of 165 square miles and a population of 5350. The chief exports are salt and sponges. GRAND TURK is the chief town. Jamaica is a Crown Colony, but has a partly elective Legislative Assembly.

Leeward Islands. — This name is generally applied to the northern section of the Lesser Antilles in the West Indies. The group lies to the south-east of Porto Rico and is divided into five presidencies, — Antigua, St. Kitts, Dominica, Montserrat, and the Virgin Islands. *Antigua* has an area of 108 square miles and a population of 34,178. The islands of Barbuda and Redonda are included in its government. The chief town is ST. JOHN. *St. Kitts* has an area of 65 square miles and a population of 29,782. The islands of Nevis and Anguilla are included in its government. The chief town is BASSETERRE. *Dominica* has an area of 291 square miles and a population of 28,894. The chief town is ROSEAU. *Montserrat* has an area of 32 square miles and a population of 12,215. The chief town is PLYMOUTH. The *Virgin Islands*, such as belong to Great Britain, have an area of 58 square miles and a population of 4938. The chief town is ROADTOWN on Tortola Island. The total area of the group is about 700 square miles, with a population of 127,336. The chief exports are sugar, rum, fruits, lime-juice, cocoa, timber, and coffee. The Leeward Islands form a Crown Colony, with a partly elective Legislative Assembly.

Windward Islands. — A series of islands extending from Martinique in the direction of Venezuela. The area of the group is about 500 square miles and the population 160,869. The principal islands are St. Lucia, St. Vincent, the Grenadines, and Grenada. *St. Lucia* has an area of 233 square miles and a population of 50,934. The chief town is CASTRIES, which is a naval station and has perhaps the best harbor in the West Indies. St. Lucia is a Crown Colony. *St. Vincent* has an area of 147 square miles and a population of 46,000. The chief town is KINGSTOWN.

In 1902 a violent eruption of the *Soufrière*, an apparently dormant volcano, laid waste a large part of the island. St. Vincent is a Crown Colony. The *Grenadines* are a group of small islands lying between St. Vincent and Grenada. The largest island, Carriacou, is attached to Grenada, the others to St. Vincent. The area of the group is 33 square miles. *Grenada* has an area of 133 square miles and a population of 65,627. The capital is ST. GEORGE'S. Grenada is a Crown Colony. The chief exports of the Windward Islands are cocoa, spices, cotton, sugar, rum, cassava, and ginger.

Aves. — A small island, lying to the west of the Windward group in the West Indies. It was annexed in 1904.

Barbados. — The most easterly of the British West Indies. It is 21 miles long and 14 miles wide, with an area of 166 square miles and a population of 196,000. The principal exports are sugar, cotton, molasses, rum, hides, and whale-oil. The capital is BRIDGETOWN. Barbados is a Crown Colony.

British Guiana. — A colony in the northern part of South America. Its area is 109,000 square miles and its population 300,000. The whole population lives for the most part in the flat coast region; the interior is mountainous and covered with forests and inhabited principally by Indians. The chief exports are sugar, rum, molasses, gold, rubber, timber, and diamonds. The capital is GEORGETOWN. British Guiana is a Crown Colony, with a partly elective Council.

Trinidad. — An island about 16 miles east of the coast of Venezuela. It is 48 miles long, with an average breadth of 35 miles and an area of 1754 square miles. The population is 255,148. The surface is generally flat, but there are several mountain ranges. The chief exports are sugar, rum, molasses, asphalt, and cocoa. The capital is PORT OF SPAIN, a coaling station. Trinidad is a Crown Colony.

Tobago. — An island about 20 miles north-east of Trinidad, to which, for purposes of government, it is attached. Its area is 114 square miles and its population 18,750. The surface is volcanic. The chief exports are sugar, rum, molasses, cocoanuts, cattle, cotton, and tobacco. The chief town is SCARBOROUGH.

Falkland Islands. — A group of over 100 islands, 300 miles east of the Straits of Magellan. The area of the islands is about 6500 square miles and the population 2050. The surface is mountainous. Sheep farming and repairing ships are the occupations of the people. The chief exports are wool and tallow. The chief town is PORT STANLEY, a coaling station. The Falkland Islands form a Crown Colony.

South Georgia. — An uninhabited island south-east of the Falkland Islands, to which it is attached. Its area is 1570 square miles.

South Orkneys and South Shetlands. — Two groups of islands in the Antarctic regions. They are uninhabited.

Graham Land. — A peninsula about 300 miles long in the Antarctic regions. It is uninhabited.

The British Empire in Australasia

Australia. — The commonwealth of Australia consists of the five Australian colonies — Victoria, Queensland, New South Wales, South Australia, and West Australia, — and the island of Tasmania. The area of the commonwealth is 2,972,573 square miles and the population 3,771,715. *See Pages 438–448.* Dalgety, on the Snowy River, in New South Wales, midway between Sydney and Melbourne, has been chosen as the site of the new capital of Australia, but nothing has been done as yet toward moving the seat of government there.

Tasmania. — An island off the south-east coast of Australia, separated by Bass Straits from the mainland. Its area is 26,215 square miles and its population 172,475. Tasmania is one of the federated states of the Australian commonwealth.

New Zealand. — A group of three islands about 1000 miles south-east of Australia. The islands are known as North Middle and Stuart Islands. The area of the group is 104,471 square miles and the population 772,719. The *Auckland Islands*, 200 miles to the south, and the *Chatham Islands*, 536 miles to the east, are dependencies. The former islands are uninhabited, and the latter contain only 419 people. There are also a number of smaller islands attached to the government. *See Pages 448–449.* New Zealand has responsible self-government.

New Guinea. — The island of New Guinea lies to the north of Australia, from which it is separated by Torres Strait. A portion of the island containing 90,540 square miles, with a population of 350,000, belongs to Great Britain. The island is very mountainous and densely covered with forest. The exports from British New Guinea are sago, bananas, sugar, bamboo, cotton, gold, rubber, sandalwood, tobacco, and camphor. The principal town is Port Moresby. New Guinea is a dependency of the Australian Commonwealth.

Norfolk Island. — An island in the Pacific Ocean, about 1000 miles from the Australian coast. It has an area of 10 square miles and a population of 827. The inhabitants, who are engaged in agriculture and whaling, are for the most part the descendants of the mutineers of the *Bounty*, who were removed there from Pitcairn Island in 1856. Norfolk Island is a dependency of New South Wales.

Fanning Island. — A small island, with an area of 15 square miles and a population of 150, in the North Pacific. The cable from Vancouver to Australia touches on this island.

Fiji Islands. — A group of volcanic islands, about 200 in number, in the Pacific Ocean. Included in the Fiji Islands is *Rotumah*, about 250 miles north of the group. The area of the colony is 8045 square miles and the population 120,124. The chief islands are Viti Levu and Vanua Levu. The capital, Suva, is situated on Viti Levu. The islands are mountainous, but very fertile. The chief exports are sugar, fruit, tea, bananas, pineapples, vanilla, coffee, and spices. The Fiji Islands form a Crown Colony.

Tonga or Friendly Islands. — A group of volcanic islands, about 180 in number, in the Pacific Ocean, 250 miles east of the Fiji Islands. The largest islands are Tongatabu, Vavau, and Eua. The area of the group is 390 square miles and the population 18,959. The chief exports are oranges, bananas, pineapples, and pearl-shell. The capital is NAKUALOFA. The islands are administered by the High Commissioner for the Western Pacific.

Pacific Islands. — Scattered over the Pacific Ocean are numerous islands and groups of islands belonging to Great Britain. The most important of these not already mentioned are *Christmas Island*, the *Elice*, *Gilbert*, *Keeling*, *Penrhyn*, and *Solomon Islands*. The area of all these islands is 800 square miles, with a population estimated at 30,000. The exports are the same as from the larger groups. Most of the islands are under the control of the High Commissioner for the Western Pacific.

APPENDIX A

THE GREAT LAKES AND THE RIVER ST. LAWRENCE[1]

The St. Lawrence, if we measure it from source to mouth, is one of the longest rivers in the world. It is about 2200 miles long and drains a basin 530,000 square miles in area, of which 450,000 square miles are in Canada. It is essentially a northern river, for, being situated on the south side of its basin, nearly all its tributaries are from the north. The only very important contribution from the south is the Richelieu River, which drains Lake Champlain. In its course it expands into the five large lakes known as "The Great Lakes": Superior, Michigan, Huron, Erie, and Ontario. These majestic lakes form the largest chain of lakes on the globe; they contain, indeed, one-half of the fresh water on the earth's surface. The St. Lawrence, with its lake expansions, is one of the great commercial highways of the earth.

Let us follow the course of the St. Lawrence, beginning at its source in the headwaters of the *St. Louis River*, an unimportant stream which springs from the same spacious plateau that gives birth to the Mississippi and the Red River of the North.

The first expansion of the St. Lawrence is **Lake Superior**, the largest body of fresh water on the globe. This immense lake is 420 miles long, and of an average breadth of 80 miles, although at its widest part it is 160 miles broad; if it were possible to skirt its shores on the fastest express train, it would take 30 hours to go around it. Its area is 31,420 square miles, while its depth varies from 420 to 1200 feet. A passenger on a boat in the middle of Lake Superior feels as much alone as if he were in the middle of the vast Atlantic. No land is visible, and an apparently limitless expanse of water walls one in. The water itself is of a peculiar brilliance and transparency.

In the early days of exploration this inland sea was undreamed of. The consequence of this late discovery is that Lake Superior is the youngest of the Great Lakes, youngest in trade and commerce, youngest in the population on its shores. It has, however, had a giant's youth. The growth of industry here has been marvellously rapid. Both on the shore and on the islands dotting the surface of the lake, incalculable wealth has been unearthed in minerals: coal, iron, copper, nickel, and gold have been found in very rich deposits. Silver has been very plentiful, especially on Silver Island. The fish in the lake form a fruitful source of revenue. The most important fish caught for commercial purposes are the trout, whitefish, and sturgeon. The position of the lake, also, midway between the Atlantic and the Pacific, adds to its importance. On it are situated numerous supply ports for the West, as well as places of mining and manufacturing interest, of which Port Arthur and Fort William in Canada, and Duluth, Superior, and Ashland in the United States, are the most considerable. The season for navigation opens usually about the middle of April and closes about the middle of December.

[1] In connection with the study of the St. Lawrence, the student is recommended to consult "Canada and Newfoundland," by Samuel Edward Dawson, F.R.S.C., in Stanford's "Compendium of Geography and Travel," published by Edward Stanford, London. This volume is invaluable to the student of the geography of Canada.

Lake Superior is very irregular in shape. The north shore is bold, elevated, and usually rocky; the south shore is low and sandy, with occasional ledges of limestone. Toward the eastern end of the lake is a perpendicular wall of rock about 300 feet high, pierced with numerous caverns. These rocks, called "The Pictured Rocks," are one of the natural curiosities of America. Near Port Arthur is Thunder Cape, an immense ridge of solid rock 1300 feet high, rising almost perpendicularly out of the water. Along the shores are numerous islands, whose presence guarantees good harbors and ports. The centre of the lake is singularly free from islands on account of the great depth. The two largest islands, Isle Royal and Michipicoten, are not far from the shore-line.

Lake Superior drains a basin of about 100,000 square miles. This basin is traversed by more than 200 streams, many of which are extremely rocky and rapid, and hence either navigable for only a short distance or not at all. The two most important rivers are the *Nepigon*, 30 miles in length, draining Lake Nepigon, and the *Kaministaquia*, falling in at Fort William, noted for its unlimited supply of water power. Lake Nepigon is of considerable size, being 70 miles long and 40 miles wide; its area is 1450 square miles. Both the lake and the river abound in fish, and are a favorite resort of fishermen, who come from all over the continent to enjoy their favorite sport.

The outlet of Lake Superior is the *St. Mary's River*, a picturesque stream about 30 miles in length. The river is navigable through its entire course, with the exception of one point at Sault Ste. Marie, where it falls in rapids 22 feet in a distance of three-quarters of a mile. To overcome this difficulty to navigation two canals have been constructed, the one on the Canadian, the other on the American, side. The Canadian canal, completed in 1895, is 7067 feet in length and 150 feet in width; its single lock is 900 feet long and 60 feet wide. The total cost of the canal was nearly four millions of dollars. At Sault Ste. Marie are large iron works and other manufacturing establishments. *See Figures 87 and 91.*

The next lake in the great chain in point of size is **Lake Michigan**, which lies wholly within the United States. Its length is 350 miles, its average width 60 miles, and its depth 1000 feet. Its area is about 26,000 square miles. The lake has very little beach, and the water is deep almost to the shore-line. On account of this uniform depth there are no islands except on the northeast. The shore is low and usually of limestone, clay, or sand. Chicago and Milwaukee are the two most important cities on the lake. Lake Michigan is connected with Lake Huron by means of the Straits of Mackinaw.

The northern part of **Lake Huron**, the third in size of the lakes, is divided into two sections by a chain of islands extending from the St. Mary's River to Cabot's Head at the northern end of the Bruce Promontory. The channel north of these islands is known as the North Channel. The largest of the islands are St. Joseph's, Cockburn, and Grand Manitoulin. This last name is a memorial of the superstition and imagination of the early inhabitants of Ontario. Everything that appeared extraordinary to the Indians was invested with a spirit. They thought that this island resembled the couchant figure of a great giant, and hence they infused it with supernatural significance and called it Manitoulin or Great Spirit Island.

The name Manitoulin was also in the early history of Canada applied to that arm of Lake Huron known as Georgian Bay. The bay is separated from the lake itself by the Bruce Promontory and the Manitoulin Islands. The north shore is very high and rocky, but the southern and eastern part has many fine harbors, the most important being Owen Sound and Collingwood. Wiarton, Meaford, Penetang, Midland, and Parry Sound are also growing places. Most of the traffic from the upper lakes passes

through the Georgian Bay ports. The bay receives the waters of many rivers, the chief of which are: the *Spanish*, flowing into the North Channel; the *French*, draining Lake Nipissing; the *Maganetawan*, falling in at Byng Inlet; the *Muskoka*, draining the Muskoka Lakes; the *Severn*, draining Lake Simcoe; and the *Nottawasaga*. The islands, of which there are said to be 30,000, and the eastern and southern shores of the bay form one of the most charming summer resorts of the continent. A short distance inland are the Muskoka Lakes, which are each year visited by increasing numbers of Canadians and Americans.

Lake Huron has an area of 23,780 square miles, a length of 270 miles, and at the widest point a width of 105 miles, exclusive of Georgian Bay, although the average breadth is but 70 miles. In many places the lake is 600 feet deep; indeed, just off Saginaw Bay, on the American side, the depth is 1800 feet. In the southern part the eastern coast is low, but becomes bolder and more rocky until at Cabot's Head the cliff is about 325 feet high. The rivers entering Lake Huron are not numerous and are for the most part small, the chief being the *Saugeen*, the *Maitland*, and the *Aux Sables*. Southampton, at the mouth of the Saugeen River, Goderich, at the mouth of the Maitland, and Kincardine are the most important towns on the shore of the lake proper.

At the southern extremity Lake Huron narrows into the *St. Clair River*, a stream 30 miles in length and navigable throughout its course. At Sarnia the Grand Trunk Railway crosses beneath the river by means of a tunnel. The St. Clair flows into **Lake St. Clair**, a small and shallow lake, about 25 miles long and 25 miles wide, with an area of 360 square miles and an average depth of 15 feet. The steamboat channel is kept clear by dredging, and is about 26 miles long and 300 feet wide, with a depth of 16 feet. The shores of the lake are low and there are many islands scattered over the surface. The rivers *Thames* and *Sydenham* are the most important tributaries. Lake St. Clair empties its waters into Lake Erie through the *Detroit River*, about 32 miles in length, with a depth of 17 feet. The principal city on the Canadian side is Windsor, while Detroit is opposite on the American side. There are many ferries connecting the two cities, and at present the railway trains are carried across on large steam barges. The Michigan Central Railway, however, has now under construction a tunnel under the river, which will be completed before 1908. Amherstburg is another important place on the Canadian side.

The shallowest of all the great lakes is **Lake Erie**. Its greatest depth is only 220 feet, while its average is but 57 feet. It is also very different in formation from the other lakes, being long and narrow in shape. It is 250 miles in length and 38 miles wide, although at its widest part it has a width of 57 miles; its area is 10,030 square miles. The shores are for the most part low, although there are in some places clay banks of considerable height. The shallowness of the lake is a great hindrance to navigation, especially in the winter months, when the shallow parts are frozen over. Another result of this shallowness is that its waters are easily and violently disturbed by storms, and wrecks with great loss of life are sometimes the consequence. Long Point and Pelee are the principal islands, both near the shore. The lake has many tributaries, the largest being the *Sandusky*, the *Grand*, the *Huron*, and the *Raisin*. Lake Erie is a very busy lake, and has on its shores a number of important cities and towns. On the Canadian side are Port Stanley, Port Dover, and Port Colborne; on the American side Buffalo, Cleveland, and Toledo. The Erie Canal enters the lake at Buffalo. The lake abounds in fish, but the fishing is under strict regulations, and government vessels are employed to guard the interests of the Canadian fisherman.

The waters of Lake Erie empty themselves into Lake Ontario, through the *Niagara River*, 33 miles in length. This river cannot be better described than in the words of Mr. Samuel Edward Dawson of Ottawa: "The Niagara River flows from Lake Erie with a swift current, but moderates as it divides and expands to enclasp Grand Island. Below the island it unites in a broad stream 2¼ miles in width. About halfway between the lakes the rapids commence and gather momentum as they speed down an incline of 55 feet in three-fourths of a mile. At the edge of the fall is Goat Island, dividing it into two unequal parts. The crest line of the American Fall is 1080 feet and is almost straight. The Canadian or Horseshoe Fall, which carries four-fifths of the water, makes a grand curve and falls as into a huge caldron. The crest of water as it curves in a clear, green sheet over the edge is 3010 feet. It breaks into white foaming masses as it plunges into the misty abyss. It is calculated that 7000 tons of water fall every second. The height of the fall on the Canadian side is 158 feet and on the American side 167 feet. Below the falls the river runs with great rapidity between steep cliffs. A few miles below are the lower rapids, and the tortured river, compressed into a width of 300 feet between cliffs of rock 200 feet high, forms a whirlpool where the currents not only swirl round horizontally, but from below in confused waves. At Lewiston and Queenston the river resumes its tranquillity, and steamers from Lake Ontario steam up to the wharves. The total fall from Lake Erie is 326 feet in a distance of 33 miles from lake to lake. The upper rapids account approximately for 55 feet, the cataract for 160 feet, and the remaining 111 feet is in the declivity of the lower rapids."

On both sides of the Niagara River at the falls are flourishing cities connected by magnificent bridges. The water power here is so inexhaustible that both of these cities promise to become great manufacturing centres, although this advantage is being rapidly lost as power is now being furnished to other places many miles distant. Hamilton and Toronto are already supplied with electric power generated at Niagara Falls. On both sides of the river are large park reservations for the use of the public, maintained by the government of the province of Ontario and by the government of the state of New York. At Queenston Heights, overlooking the river, is the monument erected in memory of Sir Isaac Brock.

In order that ships may pass unobstructed between Lakes Erie and Ontario, the Canadian government has constructed the Welland Canal, 26¾ miles in length, from Port Colborne on Lake Erie to Port Dalhousie on Lake Ontario. The canal is 14 feet deep and has 26 locks. Many millions have been spent on this canal, and improvements are constantly being made.

The last of the Great Lakes is **Lake Ontario**, 190 miles long, with an average breadth of 55 miles, and an area of 7330 square miles. In some places the lake is 600 feet deep, and is everywhere navigable. The shores are in most places low, although in parts the banks are as high as 150 feet. One of the peculiar features in connection with the lake is the Prince Edward Peninsula, an oddly shaped projection of land cut off from the mainland by the Bay of Quinte and the Murray Canal. This canal is 5⅛ miles long, and is without locks. Numerous rivers flow into Lake Ontario, the largest being the *Genesee* and the *Oswego* in New York, and the *Credit*, the *Humber*, the *Black*, the *Moira*, and the *Napanee* from Ontario. The *Trent*, 170 miles in length, is the most important of the tributaries from the north. By using this river, and the chain of lakes drained by it, direct water communication may be had with Georgian Bay. The work of the Trent Valley Canal, as it is called, is now under construction. The harbors on the lake shore are numerous and excellent: Toronto on Toronto Bay; Hamilton on Burlington Bay; Belleville on the Bay of Quinte; Cobourg, Port Hope, Whitby, and

Kingston at the extreme eastern point of the lake. Oswego is the most important harbor on the south shore. At Kingston is the entrance to the Rideau Canal, which connects the Ottawa River with Lake Ontario.

At the mouth of Lake Ontario, where it narrows into the *St. Lawrence River* proper, is a group of islands known as The Thousand Islands. This is still another of Canada's many lovely spots for summer visitors. The wide river is sown with little rocky and wooded islands, each one beautiful in itself and each forming a necessary part in a most picturesque and unusual scene. The islands extend from Kingston to Brockville, and are easy of access from Toronto, Montreal, Boston, and New York.

As the river nears Prescott, rapids begin to appear, and these have to be overcome by a succession of canals, used, however, only in ascending the river. Before the river broadens into Lake St. Francis four series of rapids are passed by means of the Cardinal, Rapide Plat, Farran's Point, and Cornwall canals. From Lake St. Francis to Lake St. Louis there are canals on both sides of the river, the Soulanges Canal on the north, and the Beauharnois Canal on the south. At this point the river broadens into Lake St. Louis, where it receives the waters of the river *Ottawa*. Another series of magnificent rapids, overcome by the Lachine Canal, brings the river to the city of Montreal on the island of the same name. So much has the St. Lawrence fallen in its course that at Montreal it is only 11¾ feet above tide-water.

From Montreal, where it is two miles or more in width, the St. Lawrence flows in a broad stream through banks rising in many places to 100 feet in height, and receiving on its way the waters of the *Richelieu*, the *Yamaska*, and the *St. Francis*, until Lake St. Peter is reached. Here, owing to the lake expansion, the river is very shallow, and dredging has been used to render the channel deep enough for ocean vessels to pass up the stream to Montreal. At Three Rivers, the *St. Maurice River* enters the St. Lawrence, which now proceeds through magnificent scenery to Quebec, receiving in its course the waters of the *Chaudière River* from the south. At Quebec, perhaps the most superbly situated city in the world, the river broadens out to pass on both sides of the Island of Orleans, and from this point broadens continually until its mouth is reached. At Quebec the rivers *Charles* and *Montmorency* pour their streams into the St. Lawrence, and some distance below the *Saguenay* also joins its flood. From Quebec to the ocean there are many islands, but the channel for the most part is clear. The mouth of the river is indented with many bays, and receives many small rivers. It is a magnificent expanse of water, 60 miles in width. Just as it enters the ocean, its current is divided by the island of Anticosti, a very large and rather barren island.

Large sums of money have been spent by the Dominion government on the navigation of the St. Lawrence, in the way of deepening the channel, building canals, and providing lighthouses and buoys to guide the pilots. The largest ocean steamers can now steam up the St. Lawrence as far as Montreal, and find safe anchorage there. More and more attention is being paid to the river as a commercial highway, with great benefit to the prosperity of the Dominion.

THE TRIBUTARIES OF THE ST. LAWRENCE

The Ottawa is the most important tributary of the St. Lawrence. Its length is about 780 miles, and the area of its basin is 80,000 square miles. Like all Laurentian rivers, its course is interspersed with rapids and lake expansions. Lake Temiscaming (Deep Lake), around which is situated excellent agricultural land, is the first important lake expansion. This lake, from 1 to 5 miles broad, 75 miles long, and 612 feet above

the sea, is now reached by two railways, one from North Bay and the other from Mattawa. Farther down, at Pembroke, the river expands into Lake Allumette, divided at the lower end by two islands, Allumette and C[illegible]net. The rapids between this lake and Lake Coulonge, a few miles below, is overcome by the Culbute Canal on the Quebec side. At the city of Ottawa there is a drop of 40 feet in the bed of the river, producing the Chaudière Falls. From here to Montreal the river is navigable, the three intervening rapids being overcome by the Carillon and Grenville Canal, 10 miles in length. At Montreal, the Ottawa pours its discolored waters into the St. Lawrence, whose clear flood refuses to mingle with them, the two keeping quite distinct until tide-water is reached.

The chief tributaries of the Ottawa from Ontario are the *Montreal*, an old canoe ronte to Hudson Bay; the *Mattawa*, the old canoe route to Georgian Bay and the upper lakes; the *Petewawa*, 140 miles long; the *Bonnechère;* the *Madawaska*, 240 miles [illegible]ng; the *Mississippi;* the *Rideau*, utilized as part of the Rideau Canal connecting Kingston and Ottawa; and the *Nation*. From Quebec it receives the *Keepewa*, tumbling in over a ledge 120 feet high; the *Demoine;* the *Black*, 120 miles long; the *Gatineau*, entering at Hull, 420 miles long, and draining a basin of 12,000 square miles; the *Lièvre*, 170 miles long, draining 4000 square miles; the *Rouge*, 120 miles long; and the *Rivière du Nord*. All of these are important lumbering streams.

The Ottawa was the fur-trader's route to the Great West. In 1615 Champlain, on his way to visit the Huron Indians on the shores of Georgian Bay, went up the Ottawa, followed the Mattawa to Lake Nipissing, and then down the French River. A ship canal has been recently projected to follow this route and thus avoid the long détour around southern Ontario. If this is done, 570 miles of navigation will be saved, and the grain trade will be diverted from Buffalo and the Erie Canal to Montreal.

The St. Maurice, 300 miles long, and receiving many tributaries, is an important stream, entering the St. Lawrence by three months at Three Rivers. Twenty-five miles above its mouth are the Shawinigan Falls, 150 feet in height, where water power has been developed to drive pulp and paper mills.

The Saguenay, sometimes called the River of Death, drains an area of about 24,000 square miles. Its source is Lake St. John, a shallow lake 28 miles long and 20 miles broad, with an area of 365 square miles, and after a course of 112 miles it discharges into the St. Lawrence at Tadoussac. It is navigable for the largest vessels afloat up to Point Roches, 57 miles from the mouth of the river, and 6 miles beyond that to Chicoutimi for smaller vessels. Fifteen miles below this is Ha Ha Bay, an arm projecting from the main stream. In its upper course the Saguenay is a bright and cheerful stream, running between forest-clad hills 300 to 500 feet high. "The lower Saguenay is the sternest and gloomiest stream in the world. It is more like a profound mountain loch of from three-fourths of a mile to two miles of water, black with the shadow of savage cliffs rising sheer 1000 to 1800 feet from the sullen surface. The cliffs are bare, for fire has swept away such [illegible]st as the scanty soil would permit to grow and left only the charred spikes. Wooded valleys run up between the hills along the little tributaries, but they also are dark and gloomy. The savage grandeur of t[illegible]nery culminates at Capes Trinity and Eternity, the southern and northern he[illegible]ds of Eternity Cove. Gloomy and grim as fate, these terrible cliffs frown over th[illegible]ack abyss of water; and the report of a gun reverberates in numberless explosions from cliff to cliff round the bay and far up and down the black river."

Other tributaries of the St. Lawrence from the north bank are the **Montmorency**, falling into the St. Lawrence, 8 miles below Quebec, over a cliff 225 feet high; the **Jacques Cartier**, the **Batiscan**, the **St. Charles**, and the **Ste. Anne**.

The Richelieu is the most important of the southern tributaries. From the point where it issues from Lake Champlain to its mouth at Sorel is a distance of 81 miles. The rapids along its course have been overcome by the Chambly Canal, 12 miles in length, so that ships can now pass by the Richelieu into Lake Champlain and thence by canal into the Hudson River. By this route a large quantity of freight is interchanged, such as coal, lumber, and grain. The valley of the Richelieu is as level as a floor and has long been noted for agriculture.

Other tributaries of the St. Lawrence from the south are the **Yamaska**; the **St. Francis**, 130 miles in length, draining Lake St. Francis, and through the *Magog River*, Lake Memphremagog; the **Chaudière** draining Lake Megantic; and the **Etchemin**.

THE ST. LAWRENCE CANALS

Name	Length in Miles	Locks			
		Number	Dimensions	Rise	Depth on Sill
				Feet	Feet
Lachine	8½	5	270 by 45	45	[2] At 2 locks, 18 At 3 locks, 14
Soulanges	14	5	280 by 45	84	15
Cornwall	11	6	270 by 45	48	14
Farran's Point	1	1	800 by 45 200 by 45	3½	14 0
Rapide Plat	3⅔	2	270 by 45	11½	14
Galops	7⅓	3	800 by 45 (1) 270 by 45 (2)	15½	14
Weiland	26¾	26	270 by 45	326¾	14
Welland Branches—					
[1] Welland River Branch	⅔	2	150 by 26½	[3] 10	9.10 in.
[1] Grand River Feeder	21	2	150 by 26½ (1) 200 by 45 (1)	7 to 8	9
[1] Port Maitland Branch	1¾	1	185 by 45	7½	11
Sault Ste. Marie Branch	1½	1	900 by 60	18	[4] 20.3 in.
Total	73¾	49			

[1] These are branches of the Welland, but for the purposes of direct navigation their length and number of locks are not to be taken in. [2] The depth of the canal between locks is now adapted to vessels of 14 feet draught. [3] From the canal at Welland down to the Welland River. [4] At lowest known water level.

APPENDIX B

THE HUDSON BAY BASIN

Hudson Bay occupies the interior of the great Laurentian V-shaped plateau, the nucleus of the continent. Its drainage basin is separated from the two great drainage basins of Canada, the Mackenzie and St. Lawrence, by a very low divide, the waters often interlacing in a manner bewildering to the explorer. On the west lies the Mackenzie Basin; on the south-west, the Winnipeg sub-basin, the drainage of which discharges into the bay by the Nelson; on the south, the St. Lawrence. This immense inland sea has a width of 1000 miles at its widest part; its length from Fox Channel, its northern extension, to the southern point of James Bay is 1300 miles. By Fox Channel it opens into the Arctic, and through Hudson Strait into the Atlantic.

Hudson Strait, lying between 60° and 65° north latitude, is 450 miles long, with an average width of 100 miles; its narrowest part is 45 miles wide. The water is from 600 to 1200 feet deep, and clear of all islands. The water in the bay is much shallower, varying from 400 to 600 feet in depth. James Bay is very shallow, and one can frequently touch bottom with an oar in many places out of sight of land. Only down the centre of James Bay to Moose Factory is there a channel of sufficient depth for navigation. The entire basin, it will thus be seen, is shallow, an elevation of 600 feet being sufficient to convert the whole area into an immense level plain.

Only along the south-east, south, and south-west is the coast of the bay low. Elsewhere, as in the strait, it is generally bold and rock-bound. The bay is singularly destitute of good harbors, the only one capable of receiving large vessels being Churchill, an excellent harbor, sheltered from all winds.

The area of the Hudson Bay basin with the Winnipeg sub-basin is immense, being estimated at 3,000,000 square miles. The Red River, rising in Minnesota, empties its waters into the bay through the Nelson, as does also the Saskatchewan, which rises in the Rocky Mountains.

The rivers emptying into Hudson Bay are many, the chief being the *Churchill*, a beautiful, clear stream, with many lake expansions, 1100 miles in length. The *Nelson*, called after the master of a ship who died at its mouth in 1612, is the largest of the tributaries, carrying, as it does, the water collected from the basins of two large rivers. Its length is 360 miles, but for navigation it seems improbable that the Nelson will ever be important, owing to its many rapids and the absence of a harbor at its mouth. Its width varies from one-half a mile to one and a half miles, until within 10 miles of tide-water, where it widens to 3 miles. Eight miles farther south is the *Hayes River*, at the mouth of which is York Factory, navigable for 140 miles for light-draught vessels. It is the canoe route to Norway House and Lake Winnipeg. The next considerable river is the *Severn*. This is a shallow stream, but its banks are well wooded. The *Albany* is an important river, at present the northern boundary of Ontario. The *Moose River*,

entering James Bay at the extreme south, is navigable for 100 miles, and is much used as a canoe route from the bay to Lake Superior. A tributary of this river, the *Abitibi*, furnishes a convenient canoe route from Lake Temiscaming and the Upper Ottawa. *Rupert River*, entering from the south-east at Rupert House, has its source in Lake Mistassini; a short portage from this lake over the height of land leads into water flowing into Lake St. John. Hence Rupert House is the point of departure for the Saguenay and the lower St. Lawrence. The *East Main*, the northern boundary of Quebec, the *Great Whale*, and the *Little Whale* are other tributaries from the east, important for their size.

The country around Hudson Bay possesses considerable mineral wealth, especially on the eastern side, where iron, copper, lead, and mica are present in abundance. The fisheries of the bay are important. Fox Channel is the favorite resort of American whalers, who winter on Marble Island, near Chesterfield Inlet. The cod-fishing extends from the Atlantic into the strait as far as Ungava Bay. In fur-bearing animals, such as caribou and muskox, the whole territory surrounding the bay is very productive. Feathered game, too, is plentiful, so that the Eskimos, who are found in bands all around the bay, find no great difficulty in maintaining themselves.

On the shores of Hudson Bay, York Factory, at the mouth of the Hayes River, near the Nelson, is the most important trading post of the Hudson's Bay Company, although there is practically no harbor there for ships drawing more than twelve feet of water. Other posts of the company are Fort Albany, Moose Factory, Fort Churchill, and Rupert House, at the mouths of rivers of the same names.

Considerable uncertainty exists as to the value of the bay as a commercial highway, although it has been continuously navigated since its discovery by Henry Hudson in 1610. The chief difficulty is found in Hudson Strait. The heavy ice coming down Fox Channel floats up and down the strait with the ebb and flow of the tide, which here rises as high as 40 feet and flows with great swiftness. This heavy ice, from 12 to 20 feet in thickness, constitutes a very serious danger even to the strongest vessels. Another difficulty is the proximity of the magnetic pole, on account of which the dip of the needle is so great as to render the compass practically useless, although during the summer months this is not so very serious a matter, since in that high latitude the light extends over almost the twenty-four hours, rendering the bold shores, which can be seen for 50 miles, continuously visible.

That the navigation is safe enough from July to September is proved by the fact that for 200 years the Hudson's Bay Company have sent annually one or two ships to the bay with remarkable freedom from accidents. If the Hudson Bay route from Fort Churchill to Liverpool can be shown to be as safe as that via Montreal, a distance of 530 miles would be saved, in addition to the cost of transshipment at Montreal. It is altogether probable that a railway from Winnipeg or some other western point to the shores of Hudson Bay will be an accomplished fact within a very short time. The importance of this short route to Europe to the farmers of Western Canada can scarcely be overestimated.

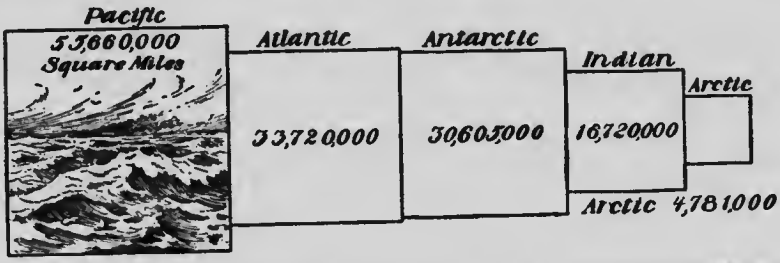
APPENDIX C

TABLES OF AREA, POPULATION, ETC.

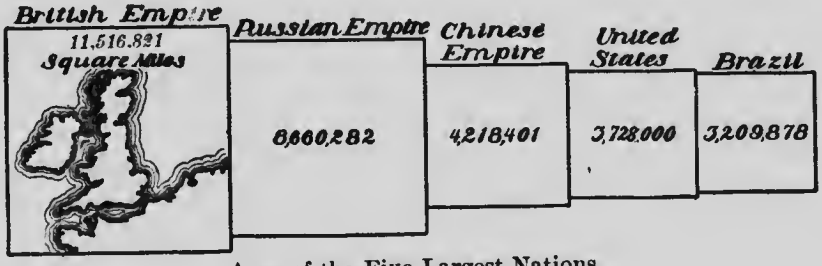
The "Statistical Year Book," issued annually by the Department of Agriculture, Ottawa, contains very valuable information relating to Canada. A copy of this book is almost indispensable in every school library.

SIZE OF THE EARTH

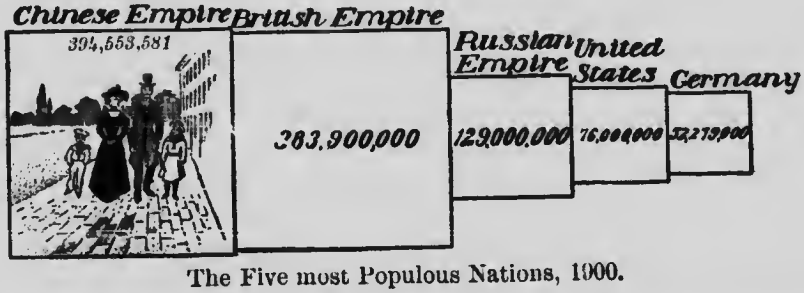
Length of the earth's diameter at the equator (miles) 7,926	The earth's surface (square miles) 196,940,000
Length of equator (miles) 24,902	Total area of oceans (square miles) 141,486,000



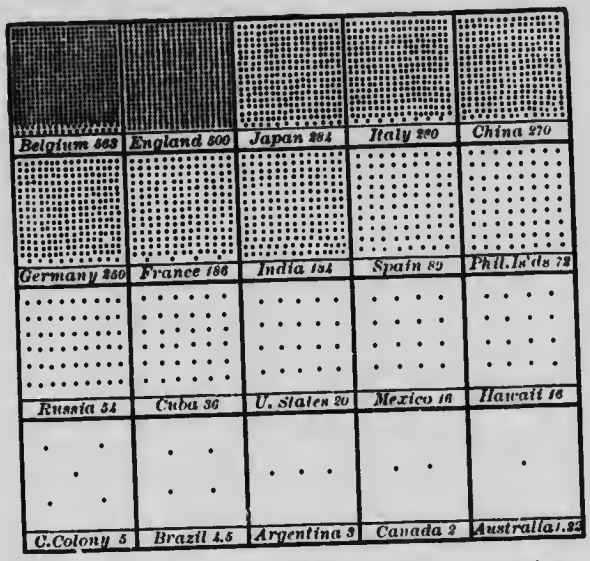
Relative Areas of Oceans. The Antarctic includes the great southern sea surrounding the south pole.



Area of the Five Largest Nations.



The Five most Populous Nations, 1900.



Density of Population of Some of the Countries.

AREA AND POPULATION OF CANADA—1901 (Last Dominion Census)

Provinces and Districts	Date of Organization or Admission	Area			Population
		Water	Land	Total	
Original Confederation —					
Ontario	July 1, 1867	40,354	220,508	260,862	2,182,943
Quebec	July 1, 1867	10,117	341,756	351,873	1,648,898
Nova Scotia	July 1, 1867	360	21,068	21,428	459,574
New Brunswick	July 1, 1867	74	27,911	27,985	331,120
Provinces admitted —					
Manitoba	July 15, 1870	9,405	64,327	73,732	254,947
British Columbia	July 20, 1871	2,439	370,191	372,630	177,272
Prince Edward Island	July 1, 1873		2,184	2,184	103,259
New Provinces —					
Saskatchewan	Sept. 1, 1905	8,318	242,332	250,650	211,649
Alberta	Sept. 1, 1905	2,360	251,180	253,540	
Yukon Territory	June 13, 1898	649	206,427	207,076	
North-West Territories	Sept. 1, 1905	51,680	1,871,055	1,922,735	
		125,756	3,618,939	3,744,695	5,890,740

CONTINENTS AND PRINCIPAL COUNTRIES

	Area in Square Miles	Population
North America	8,625,594	100,000,000
Alaska	577,390	63,441
Bahama Islands	4,004	53,735
Bermuda Islands	19	17,535
British Honduras	7,562	37,479
Central America	175,696	3,271,426
Costa Rica	22,996	294,940
Cuba	41,655	1,572,797
Guatemala	49,000	1,535,632
Greenland	500,000	10,516
Haiti (island)	28,250	1,380,000
Honduras	46,400	380,000
Jamaica	4,193	766,566
Mexico	767,005	12,686,887
Newfoundland	42,200	217,037
Nicaragua	49,000	360,000
Panama	31,571	800,000
St. Croix	84	19,783
St. John	21	984
St. Thomas	32	12,019
Salvador	7,300	803,534
Unlted States	3,602,990	76,150,768
Alabama	52,250	1,828,697
Alaska	590,884	63,592
Arizona	113,020	122,931
Arkansas	53,850	1,311,564
California	158,360	1,485,053
Colorado	103,925	539,700
Connecticut	4,990	908,355

CONTINENTS AND PRINCIPAL COUNTRIES — *Continued*

	Area in Square Miles	Population
United States — *Continued*		
Delaware	2,050	184,735
District of Columbia	70	278,718
Florida	58,680	528,542
Georgia	59,475	2,216,331
Guam	180	8,561
Hawaiian Islands	6,449	154,001
Idaho	84,800	161,772
Illinois	56,650	4,821,550
Indiana	36,350	2,516,462
Indian Territory	31,400	391,960
Iowa	56,025	2,231,853
Kansas	82,080	1,470,495
Kentucky	40,400	2,147,174
Louisiana	48,720	1,381,625
Maine	33,040	694,466
Maryland	12,210	1,190,050
Massachusetts	8,315	2,805,346
Michigan	58,915	2,420,982
Minnesota	83,365	1,751,394
Mississippi	46,810	1,551,270
Missouri	69,415	3,106,665
Montana	146,080	243,329
Nebraska	77,510	1,068,539
Nevada	110,700	42,335
New Hampshire	9,305	411,588
New Jersey	7,815	1,883,669
New Mexico	122,580	195,310
New York	42,170	7,268,012
North Carolina	52,250	1,893,810
North Dakota	70,795	319,146
Ohio	41,060	4,157,545
Oklahoma	39,030	398,245
Oregon	96,030	413,585
Pennsylvania	45,215	6,302,114
Philippine Islands	114,326	8,000,000
Porto Rico	3,550	953,243
Rhode Island	1,250	428,556
South Carolina	30,570	1,340,316
South Dakota	77,650	401,570
Tennessee	42,050	2,020,616
Texas	265,780	3,048,710
Tutuila	55	3,800
Utah	84,970	276,749
Vermont	9,565	343,641
Virginia	42,450	1,854,184
Washington	69,180	518,103
West Virginia	24,780	958,800
Wisconsin	56,040	2,069,042
Wyoming	97,890	92,531
South America	**6,837,000**	**40,000,000**
Argentina	1,778,195	3,954,911
Bolivia	567,430	2,019,549
Brazil	3,209,878	18,000,000
Chile	290,829	2,527,320
Colombia	513,938	3,878,600
Ecuador	120,000	1,271,861
Falkland Islands	6,500	2,050
Galapagos Islands	2,400	200
Guiana, British	109,000	300,000
Guiana, Dutch	46,060	64,872
Guiana, French	46,850	22,710
Juan Fernandez	36	
Paraguay	98,000	730,000
Peru	449,000	3,000,000
South Georgia Islands	1,000	uninhabited
Tobago	114	18,750
Trinidad Island	1,754	255,148
Uruguay	72,110	840,725
Venezuela	593,943	2,323,527
Europe	**3,850,000**	**374,000,000**
Andorra	175	6,000
Austria	115,903	28,895,413
Austria Hungary	240,942	41,359,204
Balearic Isles	1,860	312,593
Belgium	11,373	6,586,593
Bulgaria	38,080	3,310,718
Corsica	3,377	290,168
Crete	3,326	294,190
Denmark	15,360	2,464,770
England	50,868	31,070,194
Faroe Islands	512	15,230
France	204,092	38,641,333
German Empire	208,830	56,367,178
Gibraltar	2	27,460
Great Britain, Ireland	121,027	42,372,556
Greece	25,014	2,433,806
Hebrides Islands	3,000	100,000
Hungary	125,039	19,092,292
Iceland	39,756	70,927
Ireland	32,583	4,456,546
Italy	110,646	32,449,754
Liechtenstein	65	9,434
Luxemburg	998	236,543
Malta, Gozo, and Comino	117	188,141
Monaco	8	18,304
Montenegro	3,630	228,000
Netherlands	12,648	5,179,100
Norway	124,445	2,239,880
Orkney Islands	376	28,698
Portugal	36,038	5,428,659
Prussia	134,603	34,472,509
Roumania	50,720	5,912,520
Russia	2,095,616	106,264,136
Russian Empire	8,660,395	129,004,514
San Marino	23	9,587
Sardinia	9,294	789,314
Scotland	29,785	4,472,103
Servia	18,630	2,493,770
Shetland Islands	551	28,185
Sicily	9,936	3,529,266
Spain	197,670	18,089,500
Sweden	172,876	5,136,441
Switzerland	15,976	3,315,443
Turkey	65,752	6,086,300
Turkish Empire	1,579,982	40,440,957
Wales	7,446	1,455,881
Asia, with East Indies	**16,770,951**	**877,000,000**
Aden	80	43,974
Afghanistan	215,400	4,000,000
Arabia	845,000	6,000,000
Baluchistan	184,000	810,000
Bhutan	16,800	200,000
Bokhara	92,000	2,500,000
Burma	236,738	10,490,624
Ceylon	25,365	3,565,954
China (proper)	1,353,350	383,000,000
Chinese Empire	4,284,910	399,680,000
Chinese Turkestan	431,800	580,000
Cyprus	3,584	237,022
Formosa	13,458	2,640,309
French India	196	275,100
French Indo-China	256,096	17,999,850
Indian Empire	1,766,797	294,[illegible]0,356
Japan	161,198	4[illegible]38,249
Khiva	22,320	800,000
Korea	82,000	8-16,000,000
Manchuria	362,310	7,500,000
Mongolia	1,288,000	2,000,000
Nepal	54,000	2-5,000,000
Oman	82,000	1,500,000
Palestine	10,000	400,000
Persia	628,000	9-9,500,000
Portuguese Indies	1,458	300,000
Russia in Asia	6,564,778	22,697,469
Russian Turkestan	409,434	4,888,183
Siam	244,000	5,000,000
Siberia	4,833,496	5,727,090
Straits Settlements	1,472	572,249
Sungaria	147,950	600,000
Tibet	651,500	6,000,000
Turkey in Asia	650,394	17,545,300

CONTINENTS AND PRINCIPAL COUNTRIES — *Continued*

	Area in Square Miles	Population
Africa	11,508,793	1[illegible],000
Abyssinia	150,000	3,000,000
Algeria	184,474	4,774,042
Ashanti	15,000	1,473,882
British Central and South Africa	680,945	3,000,000
British East Africa	280,000	4,000,000
British Somaliland	68,000	240,000
Canary Islands	2,808	334,521
Cape Colony	276,955	2,404,878
Cape Verde Islands	1,480	147,424
Egypt	400,000	9,734,405
Egyptian Sudan	950,000	10,000,000
Eritrea	88,500	450,000
French Sudan	354,000	2,860,000
French Kongo	496,920	8,950,000
French Somaliland	8,640	80,000
French Territory	3,684,144	33,123,880
Gambia	4,500	77,000
German East Africa	384,180	8,000,000
German Southwest Africa	322,450	202,628
German Territory	931,460	14,200,000
Gold Coast	40,000	1,500,000
Italian Somaliland	100,000	400,000
Kamerun	191,130	3,500,000
Kongo State	900,000	30,000,000
Liberia	14,360	1,068,000
Madagascar	227,750	2,244,872
Madeira Islands	505	150,528
Mauritius Islands	729	378,195
Morocco	219,000	5,000,000
Natal	36,170	1,040,000
Niger Territories	4-500,000	25-40,000,000
Orange River Colony	50,000	585,000
Portuguese East Africa	301,000	3,120,000
Portuguese Guinea	4,440	820,000
Portuguese West Africa	484,800	4,119,300
Reunion Island	970	173,200
St. Helena	47	5,195
Sierra Leone	34,000	1,127,000
Spanish Africa	252,850	180,000
Togo	33,700	2,500,000
Transvaal Colony	116,700	1,000,000
Tripoli	398,738	1,300,000
Tunis	51,000	1,900,000
Zanzibar	1,020	200,000
Australia	2,972,573	3,771,715
New South Wales	310,367	1,352,297
Northern Territory		4,890
Queensland	668,497	496,596
South Australia	903,690	362,604
Tasmania	26,215	172,475
Victoria	87,884	1,200,918
Western Australia	975,920	182,553
East Indies and Larger Islands of Pacific.		
Borneo	309,343	2,025,576
Celebes	71,470	1,997,860
Fiji Islands	8,045	120,124
Hawaiian Islands	6,449	154,001
Java	50,554	25,125,058
Molucca Islands	48,864	399,208
New Caledonia	7,700	58,000
New Guinea	275,329	3,050,000
New Zealand	104,471	772,719
Philippine Islands	114,326	8,000,000
Samoa Islands	1,079	36,300
Solomon Islands	16,300	175,000
Sumatra	161,612	3,209,037

POPULATION OF CITIES AND TOWNS IN CANADA OF 5,000 AND OVER, SHOWING INCREASE OF POPULATION 1871-1906

	1871	1881	1891	1901	Estimate 1906
Brandon	—	—	—	5,380	8,529
Brantford	8,107	9,616	12,753	16,619	19,743
Brockville	5,102	7,609	8,791	8,940	9,000
Calgary	—	—	—	4,152	13,000
Chatham	5,873	7,873	9,052	9,068	11,000
Charlottetown	8,807	11,485	11,373	12,080	12,500
Collingwood	2,829	4,445	4,949	5,755	7,000
Cornwall	2,083	4,468	6,805	6,704	8,000
Edmonton	—	—	—	2,626	10,000
Fredericton	5,006	6,218	6,502	7,117	8,500
Galt	3,827	5,187	7,585	7,866	8,600
Glace Bay	—	—	2,459	6,945	10,300
Guelph	6,878	9,890	10,537	11,496	13,000
Halifax	29,582	36,100	38,437	40,832	45,000
Hamilton	26,880	36,661	48,959	52,634	60,000
Hull	3,800	6,890	11,264	13,993	14,000
Kingston	12,407	14,091	19,263	17,961	18,209
Lachine	1,696	2,406	3,761	5,561	7,300
Lévis	6,691	7,597	7,301	7,783	8,000
Lindsay	4,049	5,080	6,081	7,003	7,800
London	18,000	26,266	31,977	37,981	45,000
Moosejaw	—	—	—	2,042	6,500
Moncton	600	5,032	8,602	9,026	12,000
Montreal	115,000	155,238	219,616	267,730	400,000
Nanaimo	—	—	—	6,130	6,000
Nelson	—	—	—	5,273	6,000
New Westminster	—	1,500	6,678	6,499	8,000
Ottawa	24,141	31,307	44,154	59,928	65,108
Owen Sound	3,369	4,426	7,497	8,776	10,500
Pembroke	1,508	2,820	4,401	5,156	5,500
Peterborough	4,611	6,812	9,717	11,239	14,500

POPULATION OF CITIES AND TOWNS IN CANADA OF 5,000 AND OVER — *Continued*

	1871	1881	1891	1901	Estimate 1906
Portage la Prairie	—	—	—	3,850	5,500
Quebec	59,699	62,446	63,090	68,840	72,000
Regina	—	—	—	2,645	8,000
St. Catharines	7,864	9,631	9,170	9,946	11,500
St. Hyacinthe	3,746	5,321	7,016	9,210	9,328
St. John	41,325	41,350	39,179	40,711	51,000
St. Thomas	2,197	8,367	10,366	11,485	15,000
Sarnia	2,929	3,874	6,692	8,176	9,500
Sault Ste. Marie	879	780	2,414	7,169	10,000
Sherbrooke	4,432	7,227	10,110	11,765	13,500
Smith's Falls	1,150	2,087	3,864	5,155	5,500
Sorel	5,636	5,791	6,669	7,057	8,717
Springhill, N.S.	—	—	4,813	5,178	6,300
Stratford	4,313	8,289	9,500	9,959	14,000
Sydney	—	—	2,427	9,909	13,000
Three Rivers	7,570	8,670	8,334	9,981	12,000
Toronto	59,000	96,196	181,215	208,040	265,000
Toronto Junction	—	—	—	6,091	9,300
Truro	—	3,461	5,102	5,998	6,000
Valleyfield	1,800	3,906	5,515	11,055	10,000
Vancouver	—	—	13,709	26,133	45,000
Victoria	3,270	5,925	16,841	20,816	25,000
Westmount	200	884	3,076	8,856	—
Windsor	4,253	6,561	10,322	12,153	14,200
Winnipeg	214	7,985	25,639	42,340	100,000
Woodstock, Ont.	3,982	5,373	7,612	8,833	9,300
Yarmouth	2,500	3,485	6,089	6,430	7,000

CITIES AND TOWNS IN CANADA OF 2,000 AND OVER, WITH A FEW OTHERS MENTIONED IN THE TEXT

	1901	Approx. 1906
Alexandria	1,911	2,300
Almonte	3,023	3,300
Amherst	4,964	7,000
Amherstburg	2,222	2,227
Arnprior	4,152	4,200
Aurora	1,590	2,000
Barrie	5,949	7,000
Beauport	6,800	4,200
Belleville	9,117	10,000
Berlin	9,747	11,715
Boissevain	898	1,022
Bowmanville	2,731	3,000
Bracebridge	2,479	3,100
Brampton	2,748	3,300
Brandon	5,380	8,529
Brantford	16,619	19,743
Brockville	8,940	9,000
Calgary	4,152	13,000
Campbellford	2,485	2,750
Campbelltown	2,652	3,500
Canso	2,367	2,000
Carberry	1,023	1,138
Cardston	601	1,200
Carleton Place	4,059	4,100
Carman	1,439	1,600
Charlottetown	12,080	12,500
Chatham (N. B.)	4,868	5,500
Chatham (Ont.)	9,068	11,000
Chicontimi	3,826	5,000
Clinton	2,547	2,500
Coaticook	2,880	3,000
Cobourg	4,239	5,000
Collingwood	5,755	7,000
Copper Cliff	2,500	3,000
Cornwall	6,704	8,000
Cranbrook	1,650	2,500
Cumberland	—	3,000
Dartmouth	4,806	5,000
Dauphin	1,185	1,800
Dawson	9,142	6,000
Deloraine	678	900
Dundas	3,173	3,700
Dunnville	2,105	2,500
East Toronto	1,564	3,500
Edmonton	2,626	10,000
Farnham	—	3,743
Fernie	—	2,500
Fort William	3,997	8,000
Frazerville	4,569	6,000
Fredericton	7,117	8,500
Galt	7,866	8,600
Gananoque	3,526	4,000
Georgetown	1,313	4,500
Glace Bay	6,945	10,300
Goderich	4,158	5,000
Granby	3,773	5,000
Grand Forks	1,900	2,000
Grand River	1,564	3,500
Gravenhurst	2,146	2,750
Guelph	11,486	13,000
Halifax	40,832	45,000
Hamilton	52,634	60,000
Hanover	1,392	2,350
Hawkesbury	4,150	4,500
Hull	13,993	14,000
Huntsville	2,152	2,300
Indian Head	768	2,100
Ingersoll	4,573	5,000
Inverness	—	2,500
Jollette	4,220	5,150

CITIES AND TOWNS IN CANADA OF 2,000 AND OVER — *Continued*

	1901	Approx. 1906
Kamloops	1,596	2,200
Kenora (Rat Portage)	5,202	5,202
Kentville	1,731	2,000
Kincardine	2,077	2,389
Kingston	17,961	18,209
Lachine	5,561	7,800
Lacombe	450	1,200
Ladysmith	2,095	3,000
Leamington	2,451	2,800
Lethbridge	2,279	3,500
Lévis	7,783	8,000
Lindsay	7,003	7,800
Listowel	2,698	2,575
London	37,981	45,000
Lunenburg	——	3,500
Macleod	796	1,200
Manitou	617	679
Maple Creek	808	600
Marysville	1,532	2,000
Meaford	1,916	2,500
Medicine Hat	1,975	3,500
Midland	3,174	3,900
Minnedosa	1,052	1,200
Moncton	9,026	12,000
Montreal	267,730	400,000
Moosejaw	2,042	6,500
Moosomin	868	1,650
Morden	1,522	2,000
Mt. Forest	2,019	2,300
Nanaimo	6,159	6,000
Napanee	3,143	3,400
Neepawa	1,418	2,250
Nelson	5,273	6,000
Newcastle	4,000	4,000
Newmarket	2,125	2,600
New Westminster	6,499	8,000
Niagara Falls	4,244	10,000
North Bay	2,530	4,150
Orangeville	2,511	3,000
Orillia	4,907	5,500
Oshawa	4,394	5,113
Ottawa	59,928	65,108
Owen Sound	8,776	10,192
Palmerston	2,000	2,025
Paris	3,229	3,800
Parrsboro	2,705	2,700
Parry Sound	2,884	3,500
Pembroke	5,156	5,500
Penetanguishene	2,422	3,200
Perth	3,588	4,000
Petrolia	4,135	4,000
Peterboro	11,239	14,500
Pictou	3,235	4,000
Portage la Prairie	3,850	5,500
Port Arthur	3,214	7,500
Port Hood	1,891	2,500
Port Hope	4,188	4,500
Prescott	2,800	3,200
Preston	2,200	2,800
Prince Albert (Sask)	2,193	4,500
Quebec	68,840	72,000
Raymond	7	2,000
Red Deer	351	2,000
Regina	2,645	8,000
Renfrew	2,645	3,450
Revelstoke	2,200	3,000
Ridgetown	2,405	2,235
Rossland	6,159	5,000
St. Catharines	9,946	11,500
St. Germain de G.	2,573	2,316
St. Hyacinthe	9,210	9,328
St. John (N.B.)	40,711	51,000
St. Johns (Que.)	4,080	5,000
St. Marys	3,384	3,500
St. Romuald	3,589	3,776
St. Stanislas	2,294	2,284
St. Stephen	2,840	2,700
St. Thomas	11,485	15,000
Sackville	1,500	2,000
Sandwich	1,450	2,000
Sarnia	8,176	9,500
Saskatoon	——	3,000
Sault St. Marie	7,169	10,000
Seaforth	2,245	3,000
Selkirk	2,188	2,700
Shawinigan Falls	1,500	2,900
Sherbrooke	11,765	13,500
Simcoe	2,627	3,200
Smith's Falls	5,155	5,500
Sorel	7,057	8,717
Souris	839	1,500
Southampton	1,636	2,000
Springhill	5,178	6,300
Stratford	9,959	14,000
Strathcona	1,550	3,200
Strathroy	2,983	3,000
Sturgeon Falls	1,418	2,900
Sydney	9,900	13,000
Sydney Mines	3,191	6,000
Thorold	1,979	2,200
Three Rivers	9,981	12,000
Tillsonburg	2,241	2,500
Toronto	208,040	275,000
Toronto Junction	6,091	9,300
Trenton	4,217	4,000
Truro	5,993	6,000
Valleyfield	11,055	10,000
Vancouver	27,010	45,000
Vankleek Hill	1,674	2,250
Victoria	20,816	25,000
Virden	901	1,850
Wallaceburg	2,763	3,500
Walkerton	2,971	3,226
Walkerville	1,595	2,425
Waterloo	3,537	4,000
Welland	1,863	2,000
Westville	2,300	3,890
Wetaskiwin	——	3,000
Whitby	2,110	2,350
Wiarton	2,443	2,600
Windsor (N.S.)	3,398	3,000
Windsor (Ont.)	12,153	14,200
Wingham	2,392	2,500
Winnipeg	42,340	100,000
Wolseley	459	1,000
Woodstock (N.B.)	3,644	3,500
Woodstock (Ont.)	8,833	9,300
Yarmouth	6,430	7,000
Yorkton	700	1,400

CITIES OTHER THAN IN CANADA HAVING A POPULATION OF 25,000 AND OVER, WITH A FEW OTHERS MENTIONED IN THE TEXT

Aachen, Germany	135,245	Adelaide, Australia	168,066
Abbeokuta, Niger Terr.	150,000	Aden, Aden	41,910
Aberdeen, Scotland	160,780	Akron, Ohio	42,728

CITIES OTHER THAN IN CANADA — *Continued*

Albany, N.Y.	93,920
Allegheny, Pa.	188,018
Allentown, Pa.	85,416
Alexandria, Egypt	349,310
Algiers, Algiers	82,585
Altoona, Pa.	88,978
Amsterdam, Netherlands	542,675
Antwerp, Belgium	281,376
Ashland, Wis.	13,074
Asuncion, Paraguay	45,000
Atchison, Kan.	15,722
Athens, Greece	111,486
Atlanta, Ga.	96,550
Atlantic City, N.J.	27,838
Auburn, N.Y.	30,345
Auckland, New Zealand	67,226
Augusta, Ga.	39,441
Augusta, Me.	11,683
Austin, Texas	22,258
Bagdad, Turkey in Asia	145,000
Bahia, Brazil	174,412
Baku, Russia	112,253
Ballarat, Australia	46,137
Baltimore, Md.	533,000
Bangkok, Siam	250,000
Barcelona, Spain	533,000
Barmen, Germany	141,944
Basel, Switzerland	113,000
Batavia, Java	104,590
Bayonne, France	32,722
Belfast, Ireland	349,180
Belgrade, Servia	59,115
Benares, India	209,331
Bendigo, Australia	43,075
Berbera, Somaliland	30,000
Bergen, Norway	58,684
Berlin, Germany	1,931,701
Berne, Switzerland	64,064
Bilbao, Spain	83,306
Binghamton, N.Y.	39,647
Birkenhead, England	110,915
Birmingham, Ala.	38,415
Birmingham, England	533,039
Bogota, Colombia	120,000
Bologna, Italy	152,009
Bolton, England	168,215
Bombay, India	776,006
Bordeaux, France	257,638
Boston, Mass.	595,380
Bradford, England	283,412
Bremen, Germany	163,297
Breslau, Germany	439,022
Bridgeport, Conn.	77,633
Brisbane, Australia	124,463
Bristol, England	338,895
Brockton, Mass.	40,063
Brussels, Belgium	575,896
Bucharest, Roumania	232,000
Budapest, Hungary	790,529
Buenos Ayres, Argentina	753,000
Buffalo, N.Y.	400,000
Butte, Mont.	30,470
Cadiz, Spain	69,382
Cairo, Egypt	624,338
Calcutta, India	1,125,000
Callao, Peru	35,492
Cambridge, England	36,983
Cambridge, Mass.	98,444
Camden, N.J.	75,935
Canton, China	2,500,000
Canton, Ohio	30,667
Cape Town, South Africa	170,083
Caracas, Venezuela	72,429
Cardiff, Wales	172,598
Cartagena, Spain	99,871
Catania, Italy	149,295
Cawnpore, India	197,170
Cayenne, Fr. Guiana	12,351
Charleston, S.C.	56,062
Chattanooga, Tenn.	32,409
Chelsea, Mass.	34,072
Chemnitz, Germany	206,918
Chengtu, China	250,000
Chester, Pa.	33,988
Chicago, Ill.	2,200,000
Christiania, Norway	224,600
Cincinnati, Ohio	425,000
Cleveland, Ohio	414,950
Cologne, Germany	372,529
Colombo, Ceylon	158,228
Columbus, Ohio	135,487
Constantinople, Turkey	1,123,470
Copenhagen, Denmark	417,000
Cordoba, Argentina	47,609
Cordova, Spain	58,275
Cork, Ireland	76,122
Covington, Ky.	42,988
Cripple Creek, Col.	10,147
Dallas, Texas	42,638
Damascus, Turkey in Asia	225,000
Danzig, Germany	140,563
Dayton, Ohio	92,566
Delhi, India	208,575
Denver, Col.	175,000
Derby, England	105,912
Des Moines, Iowa	65,754
Detroit, Mich.	400,000
Dover, England	33,418
Dresden, Germany	491,600
Dublin, Ireland	375,350
Dubuque, Iowa	36,927
Dudley, England	96,116
Duluth, Minn.	52,966
Dundee, Scotland	162,805
Durban, Natal	59,245
Edinburgh, Scotland	327,427
Elberfeld, Germany	166,966
Elizabeth, N.J.	52,130
Erie, Pa.	52,732
Essen, Germany	118,862
Evansville, Ind.	61,482
Exeter, England	46,940
Fachan, China	400,000
Fall River, Mass.	114,044
Ferrol, Spain	36,000
Fez, Morocco	140,000
Fitchburg, Mass.	31,531
Florence, Italy	205,589
Fort Wayne, Ind.	45,115
Frankfort, Germany	289,989
Freetown, Sierra Leone	80,033
Fuchau, China	650,000
Galveston, Texas	37,789
Gateshead, England	109,888
Geneva, Switzerland	105,000
Genoa, Italy	234,710
Georgetown, Br. Guiana	53,176
Ghent, Belgium	161,125
Gibraltar, Spanish Pen.	26,203
Glasgow, Scotland	879,406
Gottenburg, Sweden	120,552
Granada, Spain	75,900
Grand Rapids, Mich.	91,630
Grimsby, England	65,772
Guatemala, Guatemala	72,102
Guayaquil, Ecuador	58,080
Hague, Netherlands	223,940
Halifax, England	104,936
Halle, Germany	156,503
Hamburg, Germany	137,004
Hangchau, China	700,000
Hankau, China	870,000
Hanley, England	100,365
Hanover, Germany	235,649
Harrisburg, Pa.	50,167
Hartford, Conn.	87,836
Havana, Cuba	235,981
Havre, France	130,196

CITIES OTHER THAN IN CANADA — *Continued*

Helsingfors, Russia	77,484
Hoboken, N.J.	64,080
Holyoke, Mass.	45,712
Hong Kong, China	324,590
Honolulu, Hawaiian Islands	39,306
Houston, Texas	44,633
Hue, French Indo-China	30,000
Hull, England	240,639
Huddersfield, England	96,218
Hyderabad, India	448,466
Indianapolis, Ind.	225,000
Iquique, Chile	33,031
Irkutsk, Siberia	51,434
Jackson, Mich.	25,180
Jacksonville, Fla.	28,429
Jersey City, N.J.	282,699
Jerusalem, Holy Land	42,000
Johannesburg, Transvaal	158,580
Johnstown, Pa.	35,936
Joliet, Ill.	29,353
Kabul, Afghanistan	70,000
Kansas City, Kan.	51,418
Kansas City, Mo.	250,000
Khartum, Egypt	25,000
Kidderminster, England	27,000
Kiev, Russia	247,432
Kimberley, Cape Colony	34,331
Kingston, Jamaica	46,542
Kingston-upon-Hull, England	240,259
Kioto, Japan	341,101
Königsberg, Germany	189,483
Krefeld, Germany	106,893
Lancaster, Pa.	41,459
Lansing, Mich.	16,485
La Paz, Bolivia	65,000
La Plata, Argentina	45,470
Lassa, Tibet	25,000
Lawrence, Mass.	67,982
Leeds, England	448,559
Leghorn, Italy	98,321
Leicester, England	220,272
Leipzig, Germany	456,124
Leith, Scotland	76,277
Liege, Belgium	167,305
Lille, France	216,276
Lima, Peru	130,000
Limerick, Ireland	38,151
Limoges, France	77,703
Lincoln, Neb.	40,169
Lisbon, Portugal	365,009
Little Rock, Ark.	38,307
Liverpool, England	743,507
Lodz, Russia	315,570
Londonderry, Ireland	39,892
London, England	6,705,781
Los Angeles, Cal.	116,427
Louisville, Ky.	237,466
Lowell, Mass.	100,150
Lucknow, India	264,049
Lynn, Mass.	72,350
Lyon, France	466,028
Madras, India	509,346
Madrid, Spain	539,835
Magdeburg, Germany	229,667
Malaga, Spain	130,109
Malden, Mass.	33,664
Manchester, England	779,966
Manchester, N.H.	60,845
Mandalay, Burma	183,816
Manila, Philippines	219,928
Marseilles, France	491,161
Maskat, Oman	40,000
Matanzas, Cuba	45,282
McKeesport, Pa.	34,227
Mecca, Turkey	60,000
Melbourne, Australia	502,610
Memphis, Tenn.	11[illegible]669
Meriden, Conn.	24,296
Messina, Italy	152,648
Metz, Germany	358,642
Mexico City	368,777
Milan, Italy	514,860
Milwaukee, Wis.	312,736
Minneapolis, Min.	263,000
Mobile, Ala.	38,469
Mombasa, Africa	30,000
Montevideo, Uruguay	284,794
Morocco, Morocco	5,000
Moscow, Russia	1,173,427
Munich, Germany	514,869
Nagoya, Japan	242,065
Naples, Italy	563,540
Nashville, Tenn.	82,711
Newark, N.J.	288,289
New Bedford, Mass.	68,955
Newcastle, England	222,241
New Haven, Conn.	114,600
New Orleans, La.	310,000
Newport, R.I.	22,084
Newton, Mass.	33,987
New York, N.Y.	4,014,304
Niagara Falls, N.Y.	22,036
Nice, France	98,760
Nijni Novgorod	95,124
Norfolk, Va.	46,624
Norwich, England	111,778
Nottingham, England	245,985
Nuremberg, Germany	260,749
Oakland, Cal.	70,386
Odessa, Russia	449,673
Omaha, Neb.	118,361
Oporto, Portugal	138,860
Oran, Algeria	85,100
Osaka, Japan	1,311,763
Oxford, England	49,336
Palermo, Italy	309,696
Panama, Panama	30,000
Para, Brazil	35,000
Paramaribo, Dutch Guiana	30,000
Paris, France	2,660,550
Paterson, N.J.	113,217
Pawtucket, R.I.	39,231
Pekin, China	1,000,000
Peoria, Ill.	62,094
Pernambuco, Brazil	111,556
Perth, Australia	46,400
Philadelphia, Pa.	1,500,000
Piræus, Greece	42,169
Pisa, Italy	61,321
Pittsburg, Pa.	321,616
Plymouth, England	107,636
Ponce, Porto Rico	27,952
Port au Prince	60,000
Portland, Me.	98,655
Portland, Ore.	150,000
Port Said, Egypt	42,095
Portsmouth, England	194,690
Posen, Germany	117,033
Potsdam, Germany	59,796
Prague, Austria-Hungary	422,381
Providence, R.I.	198,685
Pueblo, Col.	28,157
Pueblo, Mexico	91,917
Quincy, Ill.	36,252
Quito, Ecuador	80,000
Racine, Wis.	29,102
Raleigh, N.C.	13,643
Rangoon, Burma	234,881
Reading, Pa.	85,051
Reims, France	107,963
Richmond, Va.	86,148
Riga, Russia	282,943
Rio de Janeiro	792,000
Rochester, N.Y.	181,672
Rockford, Ill.	31,051
Rome, Italy	491,074
Rosario, Argentina	94,025

CITIES OTHER THAN IN CANADA — *Continued*

Rotterdam	349,267
Roubaix, France	124,661
Rouen, France	118,219
Rutland, Vt.	11,499
St. Etienne, France	186,080
St. Petersburg, Russia	1,333,600
St. Joseph, Mo.	110,479
St. Louis, Mo.	700,000
St. Paul, Minn.	197,025
Sacramento, Cal.	29,282
Saginaw, Mich	42,345
Salem, Mass.	35,956
Salford, England	220,957
Salt Lake City	57,188
Samarkand, Turkestan	54,900
San Antonio, Texas	58,581
San Francisco, Cal.	410,000
San Juan, Porto Rico	32,048
San Salvador	25,000
Santiago, Chile	320,000
Santiago, Cuba	45,478
Santos, Brazil	100,000
Savannah, Ga.	64,562
Scranton, Pa.	107,020
Seattle, Wash	92,020
Seoul, Korea	250,000
Seville, Spain	148,315
Shanghai, China	620,000
Sheffield, England	425,528
Siangtau, China	1,000,000
Singanfu, China	600,000
Singapore	228,555
Sioux City, Iowa	33,111
Smyrna, Turkey	201,000
Sofia, Bulgaria	46,593
Somerville, Mass.	68,090
Southampton, England	110,120
South Bend, Ind.	35,999
Spokane, Wash.	36,848
Springfield, Ill.	34,159
Springfield, Mass.	62,059
Springfield, Ohio	38,258
Stettin, Germany	210,702
Stockholm, Sweden	307,306
Strashurg, Germany	151,041
Stuttgart, Germany	176,699
Suchau, China	500,000
Sunderland, England	158,877
Superior, Wis.	31,091
Swansea, Wales	94,537
Sydney, Australia	511,080
Syracuse, N.Y.	114,443
Tacoma, Wash.	37,714
Tampa, Fla.	70,314
Tangier, Morocco	30,000
Tashkend, Turkestan	156,414
Taunton, Mass.	71,336
Teheran, Persia	210,000
Terre Haute, Ind.	36,673
Tientsin, China	700,000
Tiflis, Russia	160,645
Tokio, Japan	1,507,557
Toledo, Ohio	145,901
Topeka, Kan.	33,608
Trenton, N.J.	76,766
Trieste, Austria-Hungary	185,524
Tripoli, Tripoli	30,000
Trondhiem, Norway	29,162
Troy, N.Y.	60,651
Tunis, Tunis	158,000
Turin, Italy	335,656
Utica, N.Y.	60,097
Valencia, Spain	213,530
Valparaiso, Chile	143,009
Venice, Italy	158,350
Vera Cruz, Mexico	88,998
Versailles, France	54,574
Vienna, Austria-Hungary	1,761,981
Vladivostok	43,834
Wakefield, England	41,544
Warsaw, Russia	638,209
Washington, D.C.	327,000
Waterbury, Conn.	45,859
Wellington, New Zealand	49,344
Westham, England	281,894
Wheeling, W.Va.	38,878
Wilkesbarre, Pa.	51,721
Williamsport, Pa.	28,757
Wilmington, Del.	81,300
Woolwich, England	117,165
Worcester, Mass.	128,552
Wuchang, China	300,000
Yokohama, Japan	50,000
Yonkers, N.Y.	198,762
York, Pa.	33,708
Zanzibar	30,000
Zurich, Switzerland	151,994

ELEVATION OF SOME PLATEAUS AND MOUNTAIN PEAKS

	Feet
Abyssinian Plateau	5–7,000
Aconcagua, Andes, Argentina (*highest in South America*)	22,860
Apo, Mindanao, Philippines	10,312
Ararat, Turkey in Asia	17,325
Mt. Blanc, Alps, France (*highest in Alps*)	15,781
Bolivian Plateau	10–13,000
Brazilian Plateau	2–2,500
Chimborazo, Andes, Ecuador	20,498
Cotopaxi, Andes, Ecuador	19,613
Elbruz, Caucasus, Russia	18,200
Etna, Sicily	10,835
Everest, Himalayas, Nepal (*highest known in world*)	29,002
Frémont Peak, Rocky Mts., United States	13,790
Fujiyama, Japan	12,365
Hecla, Iceland	5,110
Kenia, Africa	18,620
Kilimanjaro, Africa (*highest known in Africa*)	19,780
Kosciusko, Australia (*highest in Australia*)	7,336
Logan, Coast Ranges, Canada (*highest known in Canada*)	19,539
McKinley, Alaska (*highest known in North America*)	20,464
Mauna Kea, Hawaiian Islands	13,805
Mauna Loa, Hawaiian Islands	13,675
Mayon, Luzon Island, Philippines	8,900
Mexican Plateau	5–6,000
Mitchell, Appalachian Mts., United States	6,711
Mt. Marcy, United States	5,344
Mt. Tina, Haiti	10,300
Orizaba, Mexico (*highest in Mexico*)	18,314
Pico del Turquino, Cuba	8,600
Pike's Peak, Rocky Mts., United States	14,180
Popocatapetl, Mexico	17,798
Rainier, Cascade Mts., United States	14,526
St. Elias, Alaska	18,025
San Francisco Mountain, United States	12,794
Shasta, Cascade Mts	14,180
Tibet Plateau	10–15,000
United States, Western Plateau	5–6,000
Vesuvius, Italy	4,200
Washington, White Mts., N.H.	6,293
Whitney, Sierra Nevada, California	14,898
Yunque, Porto Rico	3,609

SOME OF THE LARGEST RIVERS OF THE WORLD

	Length in Miles	Basin Area Sq. Miles	Ocean
North America			
Arkansas	2,170	185,671	Atlantic
Colorado	2,000	225,049	Pacific
Columbia	1,400	216,537	Pacific
Mackenzie	2,000	590,000	Arctic
Missouri	3,000	527,155	Atlantic
Missouri-Mississippi	4,300	1,257,000	Atlantic
Nelson	1,732	482,000	Atlantic
Ohio	975	201,720	Atlantic
Rio Grande	1,800	240,000	Atlantic
St. Lawrence	2,200	530,000	Atlantic
Yukon	2,000	440,000	Pacific
South America			
Amazon	3,300	2,500,000	Atlantic
Orinoco	1,350	366,000	Atlantic
Plata	2,580	1,200,000	Atlantic
São Francisco	1,800	200,000	Atlantic
Europe			
Danube	1,770	300,000	Atlantic
Dnieper	1,200	242,000	Atlantic
Dwina	1,000	140,000	Arctic
Elbe	725	55,000	Atlantic
Po	400	27,000	Atlantic
Rhine	800	75,000	Atlantic
Rhone	500	38,000	Atlantic

	Length in Miles	Basin Area Sq. Miles	Ocean
Europe—*Continued*			
Seine	482	30,300	Atlantic
Thames	228	6,100	Atlantic
Volga	2,400	563,309	Caspian
Asia			
Amur	2,800	520,000	Pacific
Brahmaputra	1,800	425,000	Indian
Ganges	1,500	440,000	Indian
Hoang-ho	2,700	570,000	Pacific
Indus	1,800	372,700	Indian
Irrawady	1,500	158,000	Indian
Lena	3,800	950,000	Arctic
Mekong	2,800	280,000	Pacific
Ob	3,200	1,000,000	Arctic
Yangtse-kiang	3,200	548,000	Pacific
Yenisei	3,000	1,500,000	Arctic
Africa			
Kongo	2,900	1,200,000	Atlantic
Niger	2,600	568,300	Atlantic
Nile	3,400	1,273,000	Atlantic
Zambezi	1,500	600,000	Indian
Australia			
Darling	1,100	—	Indian
Murray	1,000	270,000	Indian

SOME OF THE LARGE LAKES OF THE WORLD

	Area in Square Miles	Elevation in Feet	Greatest Depth in Feet
Aral Sea	26,900	160	225
Baikal	12,500	1,312	4,550
Balkash	7,800	780	70
Caspian	169,000	−85 [1]	2,400
Chad, variable with season	10,000 and often more	800–900	12
Dead Sea	370	−1,310 [1]	1,380
Erie	10,080	573	210
Great Bear Lake	11,200	200	—
Great Salt Lake	2,000	4,218	30–50
Great Slave Lake	10,100	—	over 650

	Area in Square Miles	Elevation in Feet	Greatest Depth in Feet
Huron	23,780	582	750
Ladoga	7,000	60	730
Manitoba	1,850	810	—
Michigan	26,000	582	870
Nicaragua	3,600	110	83
Nyassa	14,000	1,500	600+
Ontario	7,330	247	738
Superior	31,420	602	1,008
Tanganyika	[illegible]	2,800	2,100
Titicaca		12,875	700
Victoria Nyanza		4,000	500+
Winnipeg		710	70

[1] *Below* sea level.

DISTRIBUTION OF MANKIND

Mongolians	**540,000,000**
China	380,000,000
Japan and Korea	55,000,000
Indo-China	35,000,000
Malaysia	30,000,000
Other Mongolians	40,000,000
Caucasians	**770,000,000**
Europe	355,000,000
Asia	280,000,000
America	115,000,000
Africa	15,000,000
Australasia	5,000,000
Ethiopians	**173,000,000**
Africa and Madagascar	153,000,000
North and South America	20,000,000
American Indians	**22,170,000**
Mexico	8,765,000
Brazil	4,200,000
Colombia	3,150,000
Peru	2,700,000
Bolivia, Guatemala, and Venezuela	4,225,000
United States	250,000
Canada	100,000

RELIGIONS OF MANKIND

Buddhists and Brahmins	650,000,000
Christians	440,000,000
Jews	8,000,000
Mohammedans	180,000,000
Pagans and others	250,000,000

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

a, as in *fat*; *ā*, as in *fate*; *ȧ*, as in *far*; *ą*, as in *fall*; *à*, as in *last*; *ā*, as in *care*; *ă*, as in senate; *e*, as in *pen*; *ē*, as in *mete*; *ẽ*, as in *her*; *ė*, as in *event*; *i*, as in *pin*; *ī*, as in *pine*; *o*, as in *not*; *ō*, as in *note*; *ȯ*, as in *for*; *u*, as in *tub*; *ū*, as in *mute*; *ů*, as in *furl*; *u̇*, as in *pull*; *o͞o*, as in *food*; *o͝o*, as in *foot*; *oi*, as in *oil*; *ow*, as in *cow*; *g*, as in *get*; *ġ*, as in *gem*; *c*, as in *cat*; *ç*, as in *cent*; *n̲*, as in *bank*; *ş*, as in *wise*.

A, e, i, o, and u marked thus: ạ, ẹ, ị, ọ, ụ, indicate a sound obscured or slurred.

If a letter has no sound whatever in the pronunciation of a word, it is put in italics.

The sign ′ tells upon which syllable the accent is placed. The numbers refer to pages in the book, except where Fig. is before them, when they refer to figures in the book.