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AUTHOR OF "SOUTH AMERICA"

*WITH FORTY-SEVEN MAPS AND DIAGRAMS
AND SIXTY-SEVEN ILLUSTRATIONS
FROM PHOTOGRAPHS*

NEW EDITION REVISED



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PREFACE

NORTH AMERICA has many aspects of peculiar interest to Great Britain. Canada is in area the largest member of the British Commonwealth. The continent as a whole contains the greatest body of British peoples in the world. European—mainly British—civilization, transplanted in the New World, has developed along its own highly individual lines. This book attempts to tell the story of the growth of the North American countries, to depict the outstanding characteristics of their present social and economic development, and to suggest something of their future possibilities—in brief, to encourage that understanding of North America so necessary to the peaceful and orderly progress of the nations.

Many maps included in this volume are either absent from the usual school atlas, or if included are drawn on so small a scale as to be 'virtually useless for detailed study. The photographic illustrations have been carefully selected from an enormous number available. The descriptive notes accompanying most of the photographs should prove helpful in the understanding of the main points portrayed: the value of a photograph is greatly enhanced if one knows what to see. The section on Panama is essentially the same as that in the author's *South America*. The importance of the Panama Canal to both North and South America makes this overlap desirable.

The material for the text has been gleaned from many sources, but I must gratefully acknowledge in particular the value of Professor J. Russell Smith's *North America*—a book more interesting than most novels; the late Professor A. P. Brigham's *United States*; the official

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publications of the Canadian Central and Provincial Governments; and the *Statesman's Year Book*. My chapters on Canada have been read and approved by several officials at Canada House. I am greatly indebted to the Consul-General for Mexico for a most thorough revision of Chapter VII, and for many helpful suggestions. Most willing and valuable assistance has also been afforded by the following: Professor R. N. Rudmose Brown; the Consul-General for the United States; the Director of Immigration and Colonization, Canada House; the Canadian National Railways; the Canadian Pacific Railway; the Hudson's Bay Company; the New York Central Lines; the Associations of Commerce of Chicago, New Orleans, and Colorado; the Chambers of Commerce of Los Angeles, St Louis, and Seattle; the Northern Pacific Railway; the West India Committee; the *Manchester Guardian Commercial*; and the High Commissioner for Newfoundland.

E. V. LANE

NOTE TO THE REVISED EDITION

A REPRINT having been called for, the opportunity has been taken to revise the statistical detail, and to add information upon certain American matters which have arisen or become important since the first edition was published. With these amendments the book is now fully abreast of the times.

E. V. L.

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CHAPTER I

DISCOVERY AND EXPLORATION

CHRISTOPHER COLUMBUS is honoured as the discoverer of America. By boldly entrusting his vessels to the steady north-east trades he naturally reached the West Indies, and, in later voyages, Central and South America. Although Spain claimed the whole of the newly discovered lands, her interests were confined almost wholly to the tropical parts of the New World. It fell to the lot of the peoples of Northern Europe—French, Dutch, British—to explore and colonize the cooler territories of North America. Indeed, the Norsemen had actually reached the mainland of North America some 500 years before the voyages of Columbus.

During the ninth and tenth centuries the Norsemen had established many settlements in Iceland, to which they were in a sense linked by the Shetland and Faroe Islands. Iceland proved a convenient stepping-stone on the way to Greenland, and ultimately North America. The high, snow-capped plateau of Greenland was first sighted by Gunnbjorn, one of the Norsemen of Iceland, and, a century later, Eric the Red, during three years of compulsory exile—for manslaughter—explored the coasts of Greenland (A.D. 982-985). The swift East Greenland Current, which for much of the year is filled with floating ice, flows from the Arctic Ocean to Cape Farewell. Landing upon the eastern side of Greenland was therefore difficult, and, helped by the current, Eric rounded Cape Farewell to the more hospitable west coast. On his return to Iceland

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Eric induced a number of Norsemen to join him in a colonizing expedition to Greenland. Two coastal settlements were made, both west of Cape Farewell.

The map shows how close the Greenland settlements were to North America. Indeed, Bjarne Grimolfsson, son of one of the original settlers, was fog-bound on his way from Iceland to Greenland, and a northerly wind carried him to a coast of low, wooded hills—Newfoundland—whence he steered north, sighting the coasts of Labrador and Baffin Land before striking east for Greenland.

About the year A.D. 1001 Leif the Lucky, son of Eric the Red, set off on a voyage of exploration of these new coasts. To the south-east of Baffin Land, with its great flat rocks, he gave the name Helluland (*i.e.*, Slab-land). Sailing south, he made a landing on a coast with wide, sandy beaches, backed by woods, whence the name Markland (*i.e.*, Wood-land)—probably Nova Scotia, Continuing their voyage, Leif and his companions spent the winter in log-huts on the side of a lagoon, in a pleasant land of woods, grasses, wild grapes, and salmon. To this region they gave the name Vinland (*i.e.*, Vine-land). It was probably part of the coast of Massachusetts, near Cape Cod. Thorvald, brother of Leif, sailed to Vinland, and spent two summers exploring the coasts, and attempts were made to set up a permanent colony on this land, which is said to have already provided cargoes of timber of great value to the treeless settlements of Greenland. But the small number of the colonists, the long distance from their homelands, and the hostility of the natives proved insurmountable obstacles. The Greenland settlements themselves struggled on, but during the fifteenth century they lost contact with Europe, and the knowledge they had won of the New World was only preserved in the Icelandic Sagas.

The voyages of Columbus were rapidly followed by the discovery and conquest of the West Indies, Central America, and Mexico. The natives of the West Indies

DISCOVERY AND EXPLORATION

were enslaved for the mining of precious metals, and when the islands had been thus depopulated the Spaniards introduced African slaves for plantation work.

Florida, discovered in 1512, was long believed to hold vast stores of wealth, similar to those of Mexico and Peru. Of several disastrous expeditions into Florida and the northern shores of the Gulf of Mexico that of Ferdinand de Soto—a companion of Pifcarro during the conquest of Peru—is the most interesting. Sailing from Cuba in May, 1539, de Soto landed in Western Florida, and, like Cortes, sent his fleet back to Cuba to make retreat impossible. After a year spent among the forests and swamps of the unhealthy coastal plains the Spaniards marched north to the southern end of the Appalachian Ranges. Turning west from this barrier, de Soto led his weary men across the plains, their march constantly hampered by the attacks of Indians. After crossing the Alabama river the Spaniards at last came upon the broad, yellow flood of the mighty Mississippi—"Father of Waters," as the Indians had named it. Barges were made to carry men and horses across, and the journey was continued north into a thinly peopled region of native hunters.

Striking west of the great river, the Spaniards succeeded in living for a year by plundering the native villages of the Ozark Plateau. But, having lost all hope of finding wealth, de Soto at last turned south for the Gulf of Mexico, only to die, a victim of fever and despair, in May 1542. The difficulties of attempting to follow the Mississippi, with its great loops and forested, swampy banks, induced the Spaniards to journey west once more, but, finding the land increasingly sterile, they returned to the Mississippi, built seven frail ships, and sailed back to the Gulf of Mexico after four years of profitless wandering and incredible hardships.

Spain retained Florida, except for a brief period,¹ until

¹ Florida passed to England at the Peace of Paris in 1763, but reverted to Spain at Versailles in 1783.

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1819, when she sold it to the United States. Spanish Jesuits and Franciscans set up missions on the Pacific coast of California during the eighteenth century, but Spanish influence in what is now the United States has been small. The pioneer efforts of the Spaniards, however, are for ever recorded in names like San Francisco (St Francis), Los Angeles (The Angels), and San Diego (St James).

Once the wealth of the New World had been realized other Europeans were unlikely to respect the Spanish claim to all lands west of the line which by the Treaty of Tordesillas (1494) demarcated the unknown world into Portuguese and Spanish spheres. The activities of English and French pirates and buccaneers on the Spanish Main were the direct result of the attempt to keep all the trade and wealth for Spain alone. The English were rather late in their efforts at exploration, and the opening up—but not the colonization—of North America was largely the work of the French. As early as 1504 Normans and Bretons were fishing in the seas round Newfoundland. The first great French explorer was Jacques Cartier, a Breton fisherman, sent out in 1534 by Francis, King of France, to found a French colony. After exploring the coasts of Newfoundland Cartier crossed the Gulf of St Lawrence to the much more attractive shores of the mainland, with its very warm summers—whence the name Chaleur Bay (Bay of Warmth)—fine forests, wild corn, fruits, and flowers. Cartier's favourable report of the country led to his dispatch in the following year with a second expedition. On this voyage he sailed up the St Lawrence, making friends with the Indians of a village called Stadacona, the site of Quebec City, and penetrating in small boats to the great Indian town of Hochelaga, at the foot of a hill whose slopes were covered with plantations of maize. Cartier called the hill "Mont Real," whence the name of the great city of Montreal. To part of the land near Quebec Cartier gave the Indian name

A MAP of NORTH AMERICA

with HUDSON'S BAY and STRAIGHTS,
Anno 1748

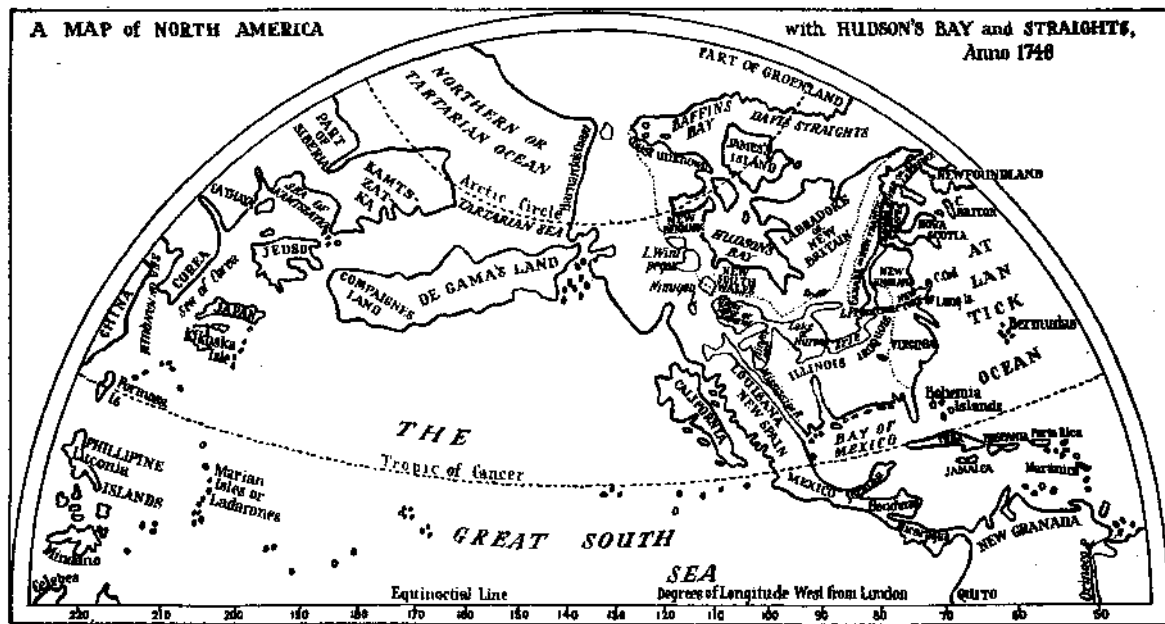


FIG. 2. AN EIGHTEENTH-CENTURY MAP OF NORTH AMERICA

This map should be carefully compared with a modern map.

By courtesy of the Governor and Committee of the Hudson's Bay Company

NORTH AMERICA

of Canada, a word that possibly meant 'village.'¹ In 1540 Cartier was sent out with a third expedition of five ships, with the ambitious aims of founding colonies, discovering a westerly route to Asia, and converting the heathen. This expedition was a failure, but it paved the way for others.

The French control of the St Lawrence region owed much to Samuel de Champlain, a brave and intelligent sailor who had come over with the French settlers in Acadia (now Nova Scotia). Champlain sailed up the St Lawrence as Cartier had done, and at once perceived the great strategic value of the lofty cliffs situated at the point where the river narrows² to about a mile in width. Here in 1608 Champlain founded a wooden fortress-settlement, later to develop into Quebec City. He regarded his fortress as a base from which he might find a westerly route to China and the East Indies; it would also control the fur trade brought to the St Lawrence by many tributaries; finally it would serve as a centre from which missionaries might convert the Indians. Champlain made friends with the Algonquins, but by so doing aroused the enmity of the powerful and fierce Iroquois Indians, who frequently raided the settlement. The severe winters, the difficulty of maintaining food-supplies, the dreadful disease of scurvy, and the treachery of some of his followers all added to the hardships of Champlain and his little band of only twenty-seven men.

On May 28, 1609, Champlain set out with a party of friendly Indians to explore farther inland by the St Lawrence. Reaching the mouth of the tributary afterwards called the Richelieu, the party entered Lake Cham-

¹ No fewer than five derivations have been suggested for the name •Canada: (1) Algonquin, *cantata* = 'welcome' (the Indian greeting to Cartier); (2) Iroquois, *canatha* = 'a collection of huts'; (3) Spanish, *acanada* = 'there is nothing there' (i.e., no sign of gold); (4) Portuguese, *Canada* = 'narrow passage'; (5) Basque, *Canada* = 'canal.' The last two would refer to the St Lawrence.

² The Indian name *Quebec* means 'The Narrows.'

DISCOVERY AND EXPLORATION

plain. To avoid meeting the hostile Iroquois it was decided to hide in the woods by day, and paddle along the lake at night. One evening, however, they encountered the Iroquois, and next day, thanks to the few arquebuses—old heavy firearms—of the French, the chiefs of the Iroquois were slain, and their followers fled.

In 1627 New France was entrusted to the Company of One Hundred Associates, a French company which had a monopoly of trade throughout the region, and only permitted French Roman Catholics to become settlers. Samuel de Champlain was appointed Governor, an office which he held until his death in 1635, except for a brief period after his capture by an English fleet sent out to support the French Protestants.

In 1642 the French established another settlement, mainly for mission work, 200 miles up the St Lawrence from Quebec. Thus Montreal was founded.

Having occupied the region of the Great Lakes, the French soon heard of the mighty river that flowed southward, and possibly (it was thought) to the Pacific Ocean. Joliet, a fur-trader, was dispatched in 1673 by the Governor of Canada to explore the Mississippi. With Father Marquette, a Jesuit missionary, and five other men, Joliet set out with two birch-bark canoes. From Green Bay, in the north-west of Lake Michigan, the explorers paddled up the Fox river, and carried their craft about a mile across a portage¹ to the river Wisconsin. Helped by the current, the little party reached the Mississippi, and for nearly a month they journeyed south, through woodlands, prairies, and marshy cane-brakes, on past the point where the turbulent, yellow Missouri—"Great Muddy River"—enters the placid waters of the Mississippi. Beyond the confluence of the Arkansas² the Frenchmen dared not

¹ A portage is a place where the water-divide between two adjacent streams is low enough to permit of the carrying ('portage') of a small boat from one stream to the other.

* Pronounced "Arkansaw."

NORTH AMERICA

venture, for friendly Indians warned them of the fierce tribes, armed with guns obtained from the Spaniards, that occupied the lands near the Gulf. The return voyage to Green Bay, against the current, occupied two months.

The pioneer voyage of Joliet was followed by the much more ambitious work of Robert Cavelier, Sieur de La Salle, who had come from France to the small fur-trading post of Montreal in 1666. A preliminary exploration of the Ohio—"Beautiful River"—and the Illinois so impressed him that he returned to France to gain permission of Louis XIV to establish colonies. On his return to Canada La Salle attempted an expedition to the Mississippi, setting out from Montreal in 1679. From the southern end of Lake Michigan the canoes were carried over a portage to the Illinois. The severity of the winter, the loss of a ship he had built on the Niagara river, above the Falls, fear of the Indians, and the desertion of his men, all combined to delay the voyage down the Mississippi, and it was not until April 1682 that La Salle had the satisfaction of setting up near one of the delta distributaries¹ of the Mississippi a column inscribed with the royal arms of France and the name of her king. On behalf of Louis XIV La Salle claimed the whole basin of the Mississippi and its tributaries, bestowing upon it the appropriate name of Louisiana.

La Salle intended to secure the interior of North America by establishing a chain of forts and colonies, including one at the south of the Mississippi. So he brought three vessels from France to the Gulf of Mexico in 1684, and, carefully avoiding the Spaniards, tried to find the Mississippi delta. The whole venture ended in disaster. La Salle was shot dead by a mutinous follower while crossing the prairies towards the Mississippi, and the ill-starred colony was decimated by disease, and finally annihilated by Indians.

¹ The various channels of a delta are called 'distributaries' because they distribute the water through many outlets.

DISCOVERY AND EXPLORATION

Within 150 years French explorers and soldiers had gained control of the vast basins of the St Lawrence, with the Great Lakes, and the Mississippi-Missouri, territories of immense potential wealth, with conditions admirably suited for white settlement. Fur-traders set up trading-posts in the St Lawrence valley, along the shores of the Great Lakes, and round the headwaters of the Ohio and Mississippi, carrying on a profitable trade. Jesuit missionaries,¹ men of inspired bravery and unflinching purpose, endured indescribable hardships and fiendish tortures in their efforts to convert the warlike Indians.

France, like Spain, had within her grasp a mighty empire in the New World. To-day France—like Spain—holds not one square mile of territory on the mainland of North America. The French hold upon North America was weak. Frenchmen in general are loath to leave their homeland, and settlers in the new lands were all too few—indeed, the French territories were too big for effective control. The French were trying to set up an empire dominated by the King and Church, centred in Paris; no serious attempt was made to found a freely developing colony, with some measure of independence. Finally, Louis XIV was more interested in the extension of French dominion in Europe than in remote lands across the Atlantic. Consequently, when the vital struggle for possession of North America took place France lost her grip, and the country fell to a people with a greater genius for permanent settlement and development in independent colonies.

The only part of North America not claimed by the French or Spaniards was the comparatively narrow strip along the Atlantic shores, shut off from the west by the forested ranges of the Appalachians. In 1609 Henry Hudson, an Englishman commanding a ship belonging to the Dutch East India Company, sailed up the river now known by his name in search of a westward route to the

¹ *The Refugees*, by the late Sir A. Conan Doyle, gives a vivid picture of the work of these gallant missionaries.

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Indies. The shallowness of the river near the site of Albany made him give up the quest. But Hudson had opened a door for Dutch settlement. A Dutch colony—New Amsterdam—was soon founded on Manhattan¹ Island, at the mouth of the Hudson, and in 1624 settlers established Fort Orange (later called Albany), which became a fur-trading post. In 1662 another Dutch colony was set up at Schenectady,² commanding the narrow Mohawk Gap through the mountains, leading west to the Great Lakes and the heart of North America. New Amsterdam became the capital of a Dutch colony called New Netherlands. This did not long remain Dutch, for in 1664 an English squadron seized New Amsterdam, and in the Peace of Breda (1667) Holland renounced her claim to the colony. New Amsterdam was renamed New York, in honour of the Duke of York (later James II).

At the time when Columbus was vainly seeking some one to fit out his expedition there was living in Bristol a Venetian named John Cabot, who had come to England in 1484. Cabot too believed that a shorter route to the Far East would be across the western ocean, but before he could fulfil his plans for a voyage of discovery the news came that Columbus had reached the Indies. Cabot and his friends were stirred to action, and King Henry VII, ready to support any enterprise that promised wealth, granted a charter to Cabot, giving him authority "to seeke out, discover and finde whatsoever isles, countries, regions or provinces of the heathen and infidels, which before this time have been unknown to all Christians/' Under the terms of the charter all new lands were to be claimed for England; Cabot and his three sons were to

¹ The name Manhattan has a curious origin. Hudson invited certain Indian chieftains to meet him on the island, and, in order to secure their goodwill, freely supplied them with drink. The Indians thereupon called the island "Manhattan," meaning, in colloquial English, 'the island where we all got tight'!

² The accent is on the second syllable. This Indian name means, very appropriately, 'gateway.'

DISCOVERY AND EXPLORATION

have control of trade with the new territories, all goods having to pass through Bristol free of customs dues; and Henry himself was to receive one-fifth of the profits from the sale of these imported goods.

On May 2, 1497, Cabot sailed from Bristol in the *Mathew*, a tiny vessel of less than 100 tons burthen, with a crew of eighteen. Cabot shaped his course on a much more northerly route than that of Columbus. At dawn on June 24 the coast of Newfoundland was sighted, and a little later the north of Cape Breton Island. Here Cabot unfurled the Royal Standard, and took possession of the country in the name of Henry VII. Finding a fertile soil and temperate climate, Cabot was convinced that he had reached North-eastern Asia. Still seeking a way to China and India, he sailed first in a northerly direction, only to be turned back by drifting ice, and then southward, discovering not only Labrador, but also Nova Scotia. Cabot thus discovered the mainland of America before Columbus, who first sighted it on his third voyage, in 1498, the year in which the Cabots made their second voyage to Canada.

The attempt to find a route to the Indies had failed; the newly discovered lands appeared unproductive, and were inhabited by savages, of whom Cabot brought three to England. But his report of the abounding wealth of fish, especially cod, round Newfoundland attracted many English and French fishermen. No effort at colonization was made, however, until 1583, when Sir Humphrey Gilbert set out to found a colony north of Florida. On reaching St John's, the headquarters of the fishermen, Gilbert formally claimed the land for Queen Elizabeth. Of his three ships one was wrecked on the way to Nova Scotia, and his own tiny craft, of ten tons only, foundered during the return voyage, only one vessel reaching Falmouth in safety.

Sir Walter Raleigh, who assisted Gilbert in the preparations for his voyage, was an enthusiastic believer in

NORTH AMERICA

colonization, but his attempts to colonize Virginia—so-called in honour of Queen Elizabeth—were doomed to failure. The name Virginia was applied to the whole coastal region from Florida to Acadia.

Successful settlements were first established in the period of the Stuart kings. During the reign of James I several companies were formed, their main object being to secure profits from trading and mining. Unfortunately, the majority of the emigrants were seeking riches, not a new home, while many were idle, good-for-nothing scamps. The most successful venture was that of the Jamestown Colony, which owed a great deal to Captain John Smith, a brave and wise leader. Most of the settlers were seeking easily acquired wealth, after the manner of the Spaniards,, but Smith convinced them that their only chance of prosperity lay in hard work. After a disastrous start the colony became rich through its tobacco trade.

The first true English colonization, aiming at permanent settlement on the land rather than profitable trade, was that of the Pilgrim Fathers, a body of one hundred Puritans who sailed from Plymouth in the *Mayflower* in 1620. During the first winter half their number perished, but their dour spirit could not be subdued, and their colony of Massachusetts prospered. The Pilgrim Fathers had left England in order to enjoy religious freedom. They did not, however, in their new home extend that tolerance to others, who therefore founded separate colonies in Rhode Island, Connecticut, New Hampshire, and New Haven.

From time to time other English colonies came into being: Maryland (1632); Carolina (1663); New Jersey (1665); Pennsylvania (1681) and Delaware (1682), two most prosperous, well-governed colonies, founded and organized by the great Quaker, William Penn; and Georgia

The Appalachian barrier can be crossed easily only at two points: one where the river Mohawk enters the Hudson; the other by the valleys of the Hudson and

DISCOVERY AND EXPLORATION

Richelieu rivers to the St Lawrence near Montreal. The French, aided by their Indian allies, for a long time barred these routes. English colonization was thus restricted to the land east of the Appalachians, where the colonists could devote themselves to agriculture, and build up a settled government with sufficient unity and strength, first, to drive back the French from the Ohio valley, and so help to break their power, and then to make themselves independent of Great Britain.

While the English were building up their coastal colonies the French were developing the fur trade in the interior. Two Frenchmen, Radisson and Groseilliers, who possessed intimate knowledge of vast areas in the heart of the continent, tried to induce their countrymen to fit out an expedition to Hudson Bay—where Henry Hudson had been left to perish by his crew in 1611—for the further extension of the fur trade. Failing to interest the French, Radisson and Groseilliers got into touch with Prince Rupert and Charles II of England. From their joint efforts there arose in 1670 the Company of Adventurers of England trading into Hudson's Bay, Prince Rupert being the first Governor. Under the terms of the Royal Charter Charles granted to the Company

the sole Trade and Commerce of all those Seas, Streights, Bays, Rivers, Lakes, Creeks, and Sounds, in whatsoever Latitude they shall be, that lie within the entrance of the Streights commonly called Hudson's Streights, together with all the Lands, Countries and Territories, upon the Coasts and Confines of the Seas, Streights, Bays, Lakes, Rivers, Creeks and Sounds, aforesaid, which are not now actually possessed by any of our subjects, or by any of the Subjects of any other Christian Prince or State.

A glance at a map of North America reveals what an immense area was thus allotted to the Company, which naturally prospered. To its tiny forts the Indians brought skins, walrus ivory, and dried fish, to receive in return guns, powder, knives, blankets, tea, sugar, etc.

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Throughout its long history the Hudson's Bay Company has played a great part in the exploration of Northern and Western Canada, as its trading posts were set up little by little throughout those vast territories. One of the aims of the Company was set forth in the Charter as "the Discovery of a new Passage into the South Sea,"¹ The finding of such a north-west passage absorbed the attention of many brave explorers, among them Sir Martin Frobisher (1576 and 1577), and Sir Francis Drake, who sailed north from Mexico, his ship laden with spoils from the Spaniards. He refitted his ship in a splendid harbour—probably that of San Francisco—and claimed the territory, "New Albion" as he called it, for Queen Elizabeth. Failing to find a passage to the North Atlantic, he sailed home by way of the East Indies and Cape of Good Hope, thus completing his voyage round the world (1577-80). In 1592 Juan de Fuca reached Vancouver Island, and believed the straits to be part of a great inland sea.

A real advance in the attempt to find a north-west passage was made by the three voyages of John Davis in 1585, 1586, and 1587, for he reached latitude $72^{\circ}12'$ N. in Davis Strait. Henry Hudson in 1610 penetrated to Hudson Bay, and six years later William Baffin discovered Lancaster Sound, the entrance to the passage he sought, but penetrated still farther north, to Smith Sound.

During the nineteenth century many expeditions were dispatched to the Arctic regions of North America, the most noted being that of Sir John Franklin, 1845-47, from which none of the party returned. The discoveries of many search expeditions greatly added to our knowledge of Northern Canada and its seas. One of these expeditions, led by R. [^]£Clure, starting from Bering Strait, did at last get through the North-west Passage (1850-54), partly by jea, partly on foot. The full passage in a ship was not accomplished until 1903, when Captain Roald Amundsen

¹ *I.e.*, the Pacific Ocean.

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sailed in the *Gjoa* from the Atlantic, and emerged from the Arctic Ocean by way of Bering Strait. But the long-sought North-west Passage was obviously of no value as a trade route. The quickest passage on record was made in the summer of 1929 by a steam vessel of the Hudson's Bay Company, which sailed from Vancouver through Bering Strait, and joined forces with two motor-craft near Victoria Island and King William Island. .

The basins of the St Lawrence, Great Lakes, and Mississippi bear indications of French exploration and occupation in names like Montreal, Sault Sainte Marie, Louisville, St Louis, Louisiana, and New Orleans. In the same way Northern Canada, in the names of its many islands, straits, and bays, bears an undying record of the names of brave explorers who ventured into the unknown during the past four centuries, impelled by desire for trade or love of discovery.

EXERCISES

1. Draw a map to illustrate the discovery, exploration, and early settlement of North America.

2. Write brief accounts of (a) French and (b) British exploration and early settlement in North America, pointing out any significant contrasts.

3. Compile brief notes on the work of de Soto, Cartier, Champlain, La Salle, and Cabot.

4. Point out the important differences and inaccuracies in the eighteenth-century map (Fig. 2) when compared with a modern map.

CHAPTER II

THE SURFACE OF NORTH AMERICA

SHAPE, SIZE, POSITION, COASTS

NORTH AMERICA resembles South America in consisting of a land mass broad in the north and tapering to the south. The mainland, if one includes Central America, extends in latitude from about 8° N. (Gulf of Panama) to 72° N. (Boothia Peninsula, where lies the North Magnetic Pole), beyond which, there are many islands, including Greenland, and some land reaching to 83° N., or less than 500 miles from the Pole. Thus the mainland extends through more than 4400 miles. In latitude North America suggests comparison with Eurasia: both lie north of the equator, and have the greater area outside the tropics.

In longitude North America stretches from Cape Race, in Newfoundland (53° W.), to Cape Prince of Wales, in Alaska (168° W.), on Bering Strait, the continent being roughly bisected by meridian 100° W., and extending from east to west some 4000 miles.

Each meridian on the earth turns through a complete circle of 360° in one day of twenty-four hours. That is to say, each meridian turns through 15° of longitude in one hour, or one degree in four minutes. Thus two meridians lying 60° apart would have a difference in time, according to the sun, of four hours, the more easterly meridian—which sees the sun first—having its time four hours in advance of the other. North America has such a vast extent from east to west that when the sun is due south and highest in the sky—*i.e.*, when it is noon—on 100° W. meridian the sun-time in St John's, Newfoundland, would be just after 3 P.M., and in Prince Rupert, British Colum-

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are estuaries, or *ria's*, formed by the drowning of the lower portions of land-valleys cut out by rivers flowing across the grain of the Appalachian Mountains. The south-east and south of the United States have been elevated within recent geological times. Consequently this part of the Atlantic coast-line is rather indefinite, consisting of low, flat shores fringed with sand-spits, shoals, and islands, and providing few good harbours.

STRUCTURE AND RELIEF

The general structure of North America is simple. The relief map reveals three divisions: a great mountain system on the west, and a smaller mountain system on the east, with extensive plains between them, the main feature lines—the grain—running north and south. Adopting a more detailed division, one recognizes five physical regions, differing in origin, scenery, and economic importance: (i) the Laurentian Plateau, or Canadian Shield, (2) the Appalachian Highlands, (3) the Western Cordillera, (4) the Atlantic Coastal Plain, (5) the Central Plains.

1. The Laurentian Plateau. This low plateau is often known as the Canadian Shield, from the resemblance to a round shield lying on its front. The hollow part of the shield is represented by the shallow Hudson Bay, from which the land slopes gradually upward towards the higher rim, marked roughly in the west by the chain of lakes—Great Bear, Great Slave, Athabaska, Winnipeg, Superior, and Huron—and in the east by the Labrador plateau. The Laurentian Plateau forms the oldest region of the continent. It consists of extremely ancient, hard, crystalline rocks (such as gneiss and schist), and at a very early stage in the geological history of the continent it must have been a mountainous region. Throughout an immense period these highlands were worn down or denuded until they had been reduced to a low plateau. This ancient plateau was later greatly affected by ice action.

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From many parts of the Shield the ^ce has removed the soil, leaving the rocks bare and scratched, with numerous

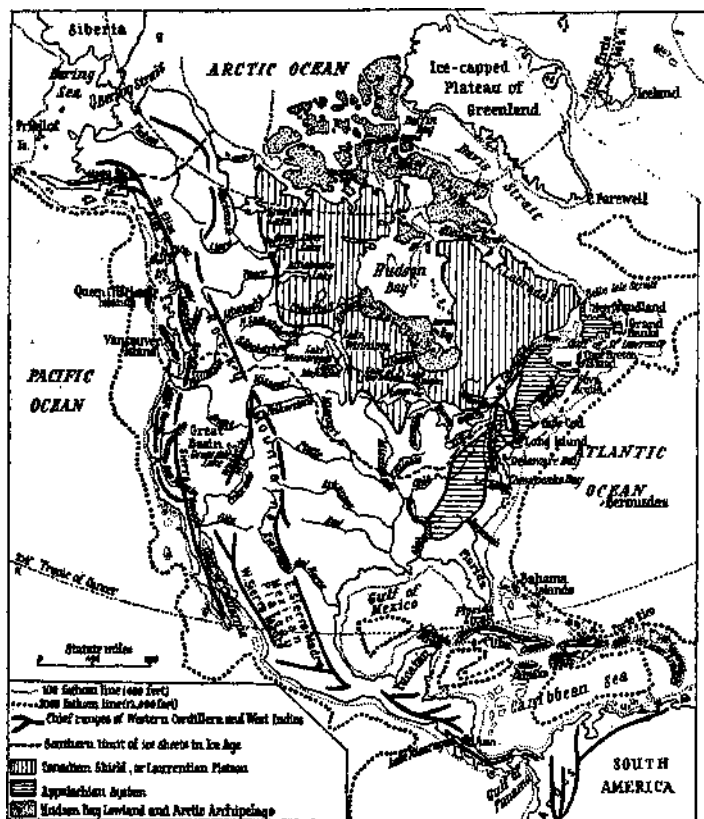


FIG. 4. THE RELIEF AND RIVERS OF NORTH AMERICA

This map should be compared with a good atlas physical map.

scooped-out Hollows. In other areas the hollows and valleys have been filled in with glacial drift—the mixture or ground-up rock materials deposited when the ice melted. The many lakes of the region lie in hollows, or

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in valleys dammed by glacial drift. The drainage is not clearly defined; a good deal of land is swampy; some lakes drain in more than one direction; many rivers have smooth stretches alternating with falls, rapids, and gorges; while in some places the water divide between streams is exceptionally low. So greatly has this ancient plateau been denuded that much of it now forms a 'peneplain'¹—*i.e.*, 'almost a plain'. Some parts of the region are of little economic value, but in others there are rich stores of minerals. On the southern margin of Hudson Bay the ancient rocks of the Shield have been covered by horizontal strata of much younger limestones.

2. The Appalachian Highlands. The Appalachian Mountains stretch for nearly 2000 miles in a north-east to south-west direction from Newfoundland to Alabama. The most easterly section is a plateau of ancient rocks, which ends abruptly on the margin of the coastal plain, to which the rivers drop by falls. Rising inland to about 1000 feet, this plateau reaches the foot of the main mountain mass. The plateau is therefore called the Piedmont Plateau—the plateau at the foot of the mountains.

The main mass of the Appalachians is a series of high, parallel ranges, smooth in outline, extending south-west from the valley of the Hudson, and varying in total width from fifty to 130 miles. The ranges are of sedimentary rocks—*i.e.*, rocks laid down under water—much younger than those of the Piedmont Plateau. These sedimentary rocks were slowly pushed up into folds, but in time the arches were worn down into a low plateau surface. This plateau was again raised up, and has, in turn, been carved out into separate ranges by the action of rivers in cutting their channels through the softer bands of rock, thus forming longitudinal² valleys. The present ridges are therefore formed of the more resistant rocks. Many rivers,

¹ Compare the word 'peninsula'—'almost an island.'

^a *I.e.*, running parallel to the direction of the ranges.

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such as the Delaware and Potomac, flow in transverse valleys—i.e., they cut right across the direction of the ranges. At one time these rivers must have risen in higher land to the west, before the Appalachian folds were crumpled up. Thus, as the folds were slowly rising the rivers continued to cut their channels deeper and deeper, producing transverse trenches.

On the west of the Appalachian Ranges is a second plateau, known as the Alleghany Plateau, composed of

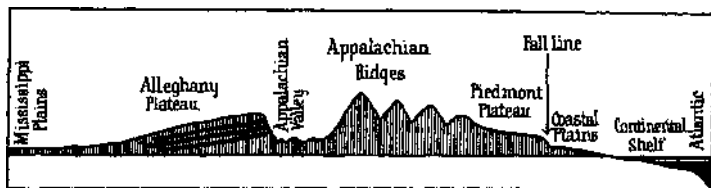


FIG. 5. DIAGRAMMATIC WEST-EAST SECTION ACROSS
THE APPALACHIANS

Note the almost horizontal coal seams of the Alleghany Plateau
The Fall Line is shown in the map at page 241.

strata dipping gently to the plains farther west, and falling on the east by a scarp to the fertile Appalachian Valley, which stretches over 1000 miles from the St Lawrence to Alabama, and separates the plateau from the main ranges. The Alleghany Plateau has been dissected by river valleys. Transport is difficult, but the wealth of coal, iron, petroleum, natural gas, and timber have brought great prosperity. The northern part of the Appalachian Valley consists of the Hudson and Richelieu-Champlain Valleys. South of the Hudson the Appalachian Valley rarely exceeds twenty-five miles in width. It furnished a great natural highway for the thousands of settlers, who left it at the Cumberland Gap to enter the rich plains beyond.

North of the Hudson the Appalachians have various names: Adirondack, Green, White, and Notre Dame Mountains on the mainland, and Long Range in New-

THE SURFACE OF NORTH AMERICA

foundland. Ice action has made the scenery contrast strongly with that of the Appalachians south of the Hudson. The northern ranges have many beautiful lakes lying in the ice-deepened valleys. Since the Ice Age the rivers have not had time to wear down their valleys into smooth, regular slopes, and their courses are marked by many waterfalls and cataracts. The Southern Appalachians were not affected by ice action. They have no lakes, and their old rivers have worn down their beds to regular, even gradients.

The Mohawk Gap, the most important transverse valley of the Appalachians, owes its existence to the Ice Age. The present St Lawrence Valley must have been blocked by ice for a period, and the Great Lakes found an outlet eastward from Lake Ontario to the Hudson Valley, thus carving out the Mohawk Gap.

The comparatively recent sinking of the Northern Appalachians has greatly reduced the area of coastal plain, and produced islands such as Newfoundland, Prince Edward, and Cape Breton, but at the same time it has made excellent harbours and good fishing grounds.

3. The Western Cordilleras. The Western Cordilleras are the most striking feature in the relief of North America. They stretch the whole length of the continent, and in the United States attain a width of 1000 miles, constituting a formidable barrier to communications between the Pacific Ocean and the interior. The chief ranges run parallel to the coast. They are much younger than the other highlands of North America, and have been built up by folding, fracturing, and uplifting on an extensive scale. Volcanoes, earthquakes, and lava-flows are present in many parts as evidences of such crustal movements.

The physical map shows two great belts of mountains, the Rockies on the east, and the Pacific ranges on the west, with a series of plateau-basins between. The name Rocky Mountains is given to the main eastern chain in

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Canada and the United States, for it rises abruptly, rocky and bare, from the Great Plains, whence it was first approached.

The Northern Rockies, extending from Alaska to the Yellowstone river, possess many peaks exceeding 10,000 feet, the highest being Mount Alberta (14,195 feet). West

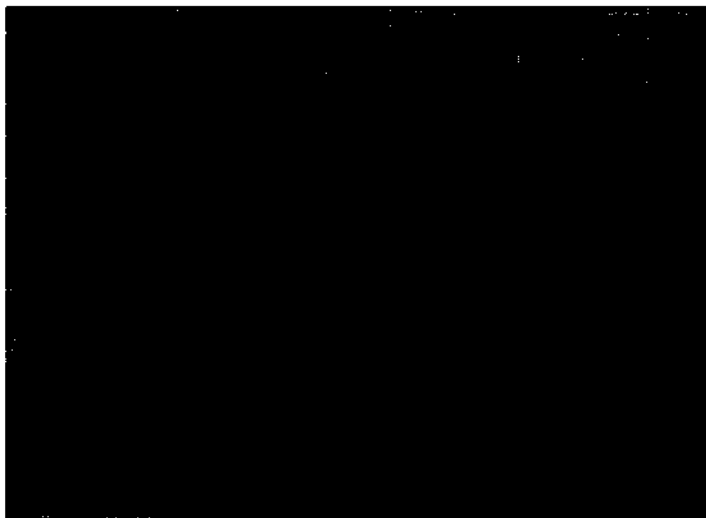


FIG. 6. MORaine LAKE AND VALLEY OF THE TEN PEAKS, ALBERTA

Towering peaks; snowfields and glaciers; forests of pine, fir, and tamarack; exquisite glacial lake; narrow bridle-trail on the right of the valley—all typical of the Canadian Rockies. There is a bungalow camp at Moraine Lake.

By courtesy of the Royal Canadian Air Force

of the Canadian Rockies rise the Gold and Selkirk Ranges, forming the western side of a longitudinal valley 800 miles long. In this valley lie the upper courses of the Fraser and Columbia, which penetrate to the Pacific by transverse gorges through the parallel ranges. The Northern Rockies possess the grandest scenery in North America. The higher peaks are always snow-clad, there are many glaciers in the high valleys, glacial lakes of entrancing

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beauty nestle among the pine-clad slopes, and rivers tumble down precipices in magnificent falls. Of several passes over the Canadian Rockies three are used by railways: Yellowhead Pass (3700 feet), Kicking Horse Pass (5350 feet), and Crow's Nest Pass (4450 feet).

The Northern Rockies pass south into the Laramie Plateau (7000-8000 feet), across which lies the easiest natural route westward, followed by the old wagon trails, and later by the Union Pacific Railway. South of the Laramie Plateau the Rockies attain a greater height, the highest summits—Gray's Peak, Long's Peak, and Pike's Peak—exceeding 14,000 feet. The surrounding depressions form the grassy or wooded Parks of Colorado. South of the Rio Grande del Norte the Rockies are continued as the Eastern Sierra Madre.

The Pacific ranges run north and south near the coast, and are known under various names. Two distinct lines may be distinguished: the Cascades, Sierra Nevada, and Western Sierra Madre on the east, the Alaska, St Elias, and Coast Ranges, with the peninsula of Lower California, on the west. Between these two lines a long valley may be traced. In the north subsidence has drowned much of this valley, forming Queen Charlotte and Puget Sounds, and producing many islands (Queen Charlotte, Vancouver, etc.), which are the highest portions of the former Coast Range, and an indented fjord coast. Farther south there is the Great Valley of California, and beyond that the long Gulf of California.

The Cascade Range of Canada consists of very old rocks, rising to 7000-8000 feet. The Sierra Nevada of California is a great uplifted block of the same old rocks, 500 miles in length, and tilted with a long gradual slope to the west, the steep scarp therefore facing the Great Basin on the east. Mount Whitney (14,501 feet), in the Sierra Nevada, is the highest in the United States. In the Cascade Range of the United States, continuing north the direction of the Sierra Nevada, the old rocks have been crowned with a

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line of volcanic peaks, **now** extinct, the loftiest being Mount Rainier (14,408 feet).

The Coast Ranges of the United States are fairly low. They consist of very ancient hard rocks, like those of the Piedmont Plateau. But in Alaska these rocks have been elevated to form the highest peaks in the whole of North America (Mount McKinley, 20,300 feet; Mount Logan, 19,540 feet; Mount St Elias, 17,978 feet).

The plateau-basins enclosed between the Rockies and the Pacific ranges are six in number:

(a) The *Yukon Plateau*, a rugged region containing valuable minerals, is drained to the Bering Sea by the Yukon, which has built a large delta.

(b) The *plateau of British Columbia*, a depression crossed by the Gold, Selkirk, and Caribou Ranges, is drained by the Skeena, Fraser, and Columbia rivers.

(c) The *Columbia Plateau* of Idaho, Oregon, and Washington is covered with great sheets of lava poured out in successive flows to a great depth. The plateau covers an area twice that of the British Isles, and is the largest of its kind in the world. The lava flowed round some of the old mountains, leaving them as islands in a sea of basalt.

(d) The *Great Basin*, lying between the Sierra Nevada and Wasatch Mountains, is an arid region of inland drainage. There are many lakes; those with no outlet except evaporation are salt, the best example being the Great Salt Lake of Utah. Death Valley, one of the most desolate parts of the earth, is a depression reaching 480 feet below sea-level.

(e) The *Colorado Plateau*, lying mainly between the Wasatch Mountains and the Rockies, is another very dry region, over 6000 feet in height, through which the Colorado and its tributaries have cut remarkably deep *canons*.¹

¹ A *canon* (or canyon) is a deeply trenched valley with steep sides. The Spanish word originally meant a tube.

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.(/).• The *Mexican Plateau*, enclosed between the Western and Eastern Sierra Madre, which are joined together in the south by a chain of lofty volcanoes.

One might judge from the map that the North American Cordilleras are continued through Central America, and so into the Andes of South America, but the actual link between the Cordilleras of North and South America may be traced through the sweeping curves of the West Indian Islands, which connect ultimately with the Venezuelan Andes.

4. The Atlantic Coastal Plain. South of New York there is a coastal plain of great importance. It is composed of young rocks raised from beneath the sea in comparatively recent geological times, and is broadest in the south, where elevation has been greatest. The coast is naturally low, but where the plain joins the ancient hard rocks of the Piedmont Plateau the rivers fall abruptly. The falls interrupt navigation, but supply power that has assisted industrial development. An imaginary line linking together the falls is known as the Fall Line.

5. The Central Plains. Between the Rocky Mountains on the west and the Atlantic Highlands (Canadian Shield and Appalachians) on the east there is a vast extent of plains, reaching the Arctic Ocean on the north and the Gulf of Mexico on the south, and covering one-third of the continent. Although the underlying rocks vary greatly they have been covered, often to a great depth, with younger deposits laid down by sea, rivers, and ice-sheets, and usually fertile. The plains are drained north to the Arctic Ocean by the Mackenzie, to Hudson Bay by the Nelson and other rivers, to the Atlantic by the St Lawrence, and to the Gulf of Mexico by the great Mississippi-Missouri system.

The relief of the Central Plains is fairly uniform. The water divide between the Arctic Ocean and the Mexican Gulf is only 800 feet above the sea, and throughout their great extent of 2500 miles the plains are broken by only

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three mountainous areas: the Ozark Plateau, the last remaining stump of an ancient mountain mass, lying west of the middle Mississippi; the forested Lake Plateau, an ancient, worn-down extension of the Laurentian Plateau, on which are Lakes Superior, Michigan, and Huron; and the Black Hills of South Dakota, a dome-shaped mass rising 3000 feet above the surrounding plains, and clad with dark pine-trees (whence the name Black Hills)—a striking contrast to the encircling grasslands.

The name Great Plains (or High Plains) is given to the land lying roughly west of 100° W. The Great Plains are really a plateau sloping gently eastward down to the Mississippi plains. They are more fully described in Chapter XL

The Gulf plains, bordering the shores of the Gulf of Mexico, merge into the Atlantic Coastal Plain on the east, and the prairies on the north and west. The low-lying coast is fringed with lagoons enclosed by islands of sand and shingle heaped up by winds and waves.

Some mention has already been made of the effects of the Ice Age upon North America. During the colder periods of the Ice Age the northern half of the continent was covered with thick sheets of ice,¹ similar to the ice-caps now resting upon Greenland and the Antarctic continent. The courses of the Missouri and Ohio roughly mark the southern limits of ice action. On the Laurentian Plateau, and round its margins, there lie over ten large and a great number of small lakes. It has been proved that these lakes are the remnants of very much greater lakes that existed when the last ice-sheet was retreating, and for a time dammed the drainage outlets to Hudson Bay and the St Lawrence. When the ice-sheet had finally melted away the huge lakes drained off to Hudson Bay or the Atlantic, until water was left only in the deeper

¹ Probably there were five ice-sheet periods, with intervals between, during which the sheets diminished in size owing to warmer climatic conditions.

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hollows. Great extents of plain were thus laid bare, and, as they are covered with silt formerly deposited on the lake bottoms, are wonderfully fertile. The name Lake Agassiz¹ has been given to the great lake that once occupied an area almost as large as the British Isles.

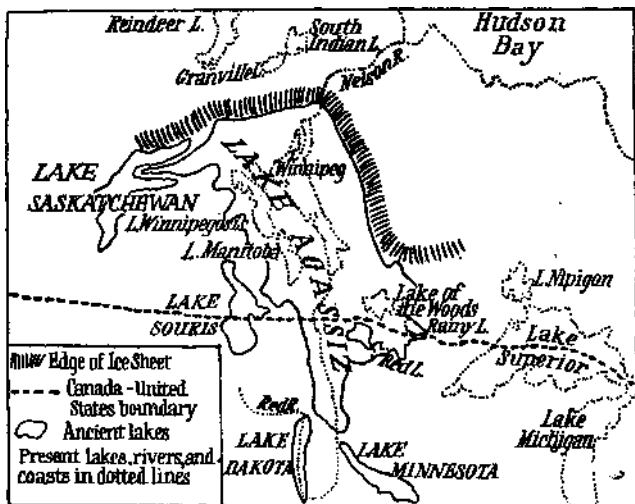


FIG. 7. ANCIENT GLACIAL LAKES

Lake Agassiz at first drained southward by the Red River Valley to the Mississippi, until the melting of the ice sheet allowed it to drain off to Hudson Bay by the Nelson river.

Lakes Winnipeg, Winnipegosis, and Manitoba are the chief remnants of this old lake.

South and west of the belt of large lakes stretching from Great Bear Lake to Lake Ontario extensive areas have been covered with thick layers of glacial drift, generally fertile, although in New England much of the land was covered with stones and large boulders. In many parts old valleys were filled with drift, while in other regions the *moraines* of rock material dropped at

¹ Named after the great Swiss geologist, Louis Agassiz.

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the edges of the melting ice-sheets formed lines of **low** hills between which rivers may flow. The ice-sheets and the rock materials they carried have greatly altered the drainage of the northern half of the continent. In taking new courses many streams have dropped over cliffs, forming falls and rapids.

LAKES AND RIVERS

The development of rivers is controlled by the distribution of rainfall, but it is perhaps more convenient to study the great rivers of North America in connexion with the relief of the continent. The greater part of North America is drained either north to the Arctic Ocean, south to the Gulf of Mexico, or east to the Atlantic. The most important river systems are those of the St Lawrence and the Mississippi.

The five Great Lakes occupy rock basins deepened by ice action, and by the piling up of glacial drift around their margins. From west to east the lakes are as follows: *

LAKE	AREA (SQUARE MILES)	HEIGHT ABOVE SEA-LEVEL (FEET)	GREATEST DEPTH (FEET)
Superior	31,800	602	1,180
Michigan	22,400	581	870
Huron	23,010	581	750
Erie	9,940	573	210
Ontario	7,540	247	738

Lake Superior is thus a little larger than Scotland, Michigan and Huron nearly as big as Ceylon, and Ontario almost as big as Wales. During the Ice Age the lakes were much larger; Ontario overflowed down the Mohawk Valley, Superior drained west to the Mississippi, and Michigan south by the Illinois Valley to the Mississippi also.

¹ Statistics from *Canada Year-book*, 1932.

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course broken by rapids such as the Lachine¹ Rapids, just above Montreal. Of the St Lawrence tributaries the most important is the Ottawa, the valley of which provides a direct and easy route to the west. Below Quebec both banks of the St Lawrence, but especially the north, rise steeply to an imposing height. The true course of the estuary may be traced on a good relief map. The immense Gulf of the St Lawrence and its unusually broad estuary are clearly the result of subsidence.

The Mississippi is one of the great rivers of the world. Its length is 2500 miles, but if one takes together the whole Missouri and the Mississippi below their confluence the total length (4220 miles) exceeds that of any other river. The total area drained is 1,253,600 square miles (about one-third the size of Europe), and there are over 10,000 miles of navigable waterways.

The Mississippi rises in Lake Itasca,² a small lake lying 1500 feet above the sea among the forested hills—really *moraines*—of Minnesota State, west of Lake Superior. As the average slope of its bed is only nine inches per mile, a gradient of 1 in 7040, it follows that the Mississippi is a sluggish river, likely to meander, or wind, across its flat plains. The upper course of the river is broken by rapids and falls over the irregular morainic deposits, the most important being the Falls of St Anthony, which mark the limit of navigation, and incidentally explain the growth of the "Twin Cities," St Paul and Minneapolis.

Below St Anthony's Falls the Mississippi wanders in a flood-plain (built up by the alluvium deposited by the river itself) about three or four miles wide, flanked by low, steep bluffs, on which towns are built to avoid the floods. At St Louis the placid waters of the Mississippi are disturbed by the influx of the Missouri. The Missouri

¹ *I.e.*, the "China" Rapids—a reminder of the old search for a route to the Far East.

² Not an Indian name, but a shortened form of the Latin words *Veritas* (truth), and *caput* (head)—an indication by a party of explorers that they had at last found the true lake source of the river.

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rises in the Rockies of Montana, and reaches the Mississippi after a course of almost 3000 miles, during which it gathers the waters of several large tributaries, such as the Yellowstone, Platte, and Kansas. These rivers bring

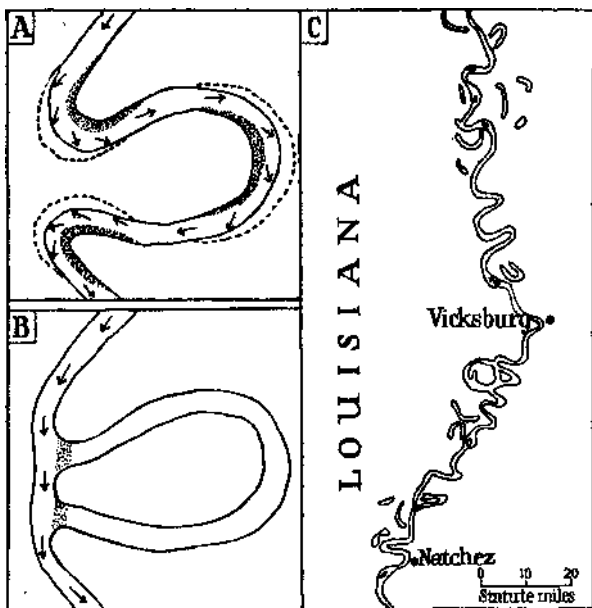


FIG. 10. THE FORMATION OF OX-BOW LAKES

In diagrams A and B the arrows indicate the direction of flow. The outer banks, being undercut, will be steep. On the inner sides of the curves the slack water will drop sediment, and so build up alluvial flats. In time of flood the river may break through the neck of the loop and straighten its course, leaving the loop of standing water to form an ox-bow lake. Diagram C shows a section of the Mississippi in Louisiana, furnishing excellent illustrations of meanders and ox-bow lakes.

down enormous volumes of water and silt, especially in spring and early summer, owing to the melting snows of the Rockies.

Below Cairo, where the chief left bank tributary, the Ohio, enters the Mississippi after draining the western slopes of the Alleghany Plateau, the main stream has an

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extremely meandering course over a huge flat flood-plain, which widens out from twenty miles in breadth until it merges into the coastal plain, below the confluence of two more large right-bank tributaries, the Arkansas and Red rivers. In this part of the course there are many great loops and cut-off, or ox-bow, lakes, the origin of which is explained in the legend to Fig. 10. The land is so flat that considerable areas are subject to flooding, and the river has not sufficient strength of flow to carry along its great load of sediment. So much sediment is deposited on the river-bed that the level of the river is constantly being raised. In time of flood sediment may be carried out beyond the channel, and deposited when the flood-waters subside. Naturally most sediment has been dropped immediately at the sides of the normal channel, building up natural levees,¹ or embankments. Attempts to keep the river within its banks have led to the building up of artificial levees, of which there are 1500 miles. Occasionally a flood of exceptional volume may break through the levees, and rapidly cover a great area of flood-plain on either side, with disastrous consequences to crops, animals, and human dwellings.² An immense load of sediment—estimated at more than 400,000,000 tons—is brought to the Gulf of Mexico every year, an average exceeding 1,000,000 tons a day! The check in its speed on entering the Gulf causes the river to deposit this sediment, and build up a great delta.³ As the coastal waters are shallow, and there is practically no tidal movement to disturb the process, the Mississippi has built out great fingers of sediment round the many distributaries, and is constantly forming new land, pushing out into the

¹ From the French *levée* = 'raised up.'

² The greatest disaster occurred in 1927, when 114 people perished, scores of towns and hundreds of farms were submerged, and the damage amounted to \$80,000,000.

³ The Greek capital letter D (delta) is written Δ—hence the original application of the name delta to the triangular sedimentary formation at the mouth of the Nile.

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Gulf of Mexico to the extent of over 100 yards a year. The changing channels of the Mississippi, the shifting sandy shoals, the soft, crumbling banks, and the great variations in level all present serious difficulties in navigation. The delta channels are dangerous owing to their banks of sand and mud. The distributary on which New Orleans stands has been improved by embankments which confine the river in a narrow channel, thereby increasing its velocity and reducing the deposition of silt. The Ohio is of great value in transport, as barges can almost reach the source, but heavy rains and melting snows occasionally cause disastrous floods, the river rising as much as sixty or seventy feet in some stretches.

EXERCISES

1. On an outline map of North America record as many facts as possible concerning the size, position, and relief of the continent. Include the continental shelf.
2. Compare and contrast North America in position, relief, and rivers with (a) South America, (b) Eurasia.
3. Using the facts given on page 46, draw a diagrammatic section to show the variations in length, depth, and surface levels of Lakes Superior, Huron, Erie, and Ontario. Mark the positions of the Sault Ste Marie and Niagara Falls.
4. Draw a section across North America along the parallel 40° N. Insert names of highlands, rivers, etc.

CHAPTER III

THE CLIMATES OF NORTH AMERICA

NORTH AMERICA is a very large land mass lying mainly within the temperate zone. As in Eurasia, there is a large interior region with an extreme continental climate and light rainfall. The wide variations in altitude, from sea-level to nearly 3 J miles above the sea, and the position of north and south mountain ranges close to the west and east coasts exercise a profound influence upon climatic conditions. It should be noted that the central plains are more exposed to the Gulf of Mexico and the Arctic Ocean than to the Pacific and Atlantic.

TEMPERATURE CONDITIONS

The isotherm maps furnish excellent examples of the various factors that influence temperature. Throughout the year the general fall in temperature is from south to north, owing to the increasing slant of the sun's rays. In Central America, the West Indies, and Southern Mexico the temperature is high all the year, owing to proximity to the equator. In summer, when both land and sea are heated by the sun, the land temperature rises more quickly than that of the sea:^x the July isotherms show that the interior of the continent has a higher temperature than the coastal regions in the same latitudes. In winter, on the other hand, when both land and sea are cooling down,

¹ One of the chief reasons for the difference in temperature of land and sea is their difference of specific heat. Put simply, this means that a given weight of water requires a great deal more heat to raise its temperature a certain number of degrees than does the same weight of land.

NORTH AMERICA

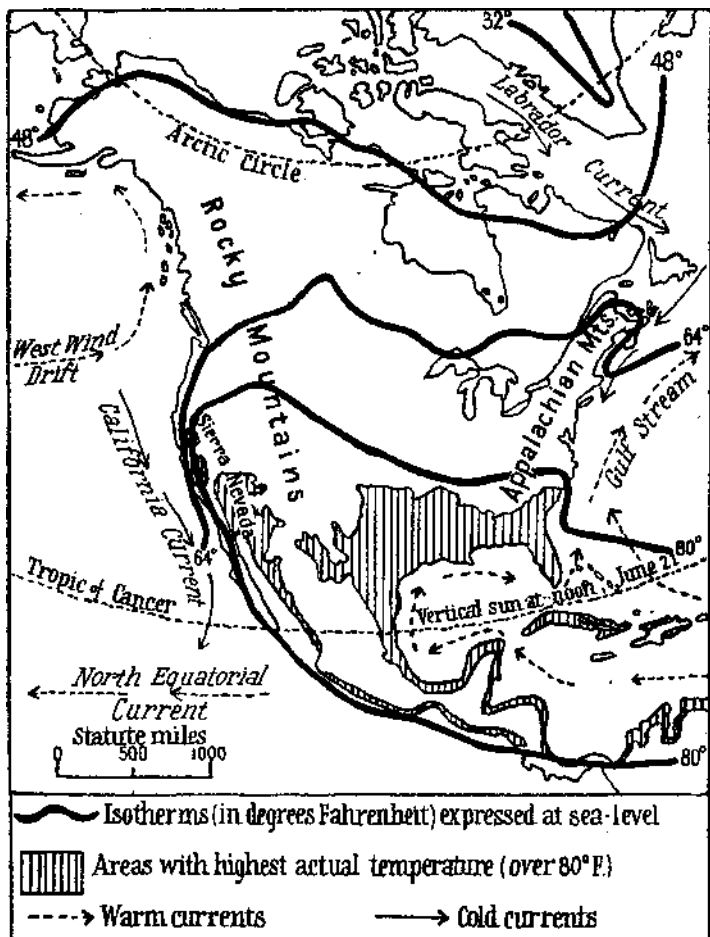
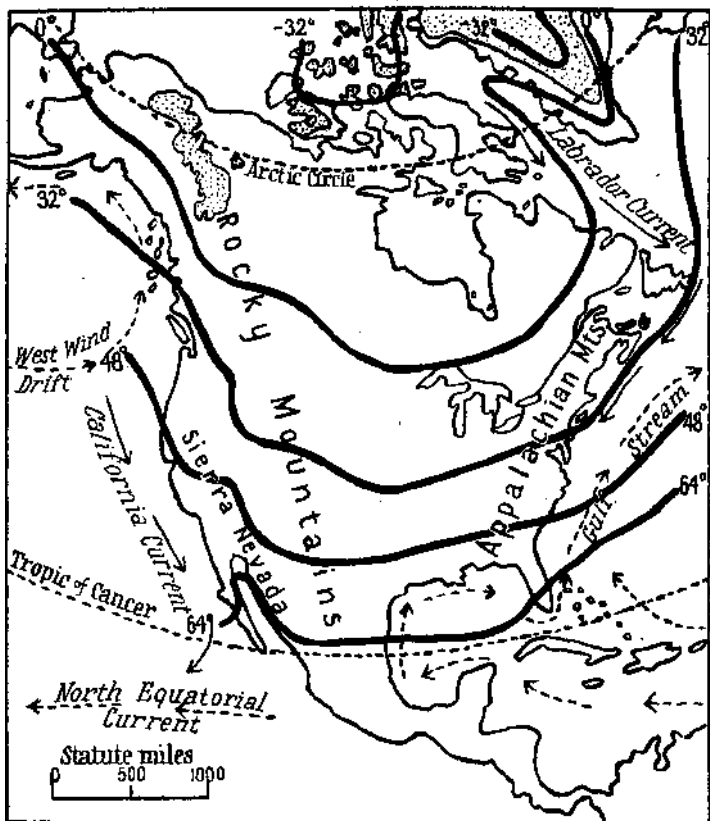


FIG. 11. JULY TEMPERATURE CONDITIONS: SUMMER

the land temperature falls quickly, while the sea is able to give out great stores of heat with a much smaller drop in temperature. The January map shows that on a given

THE CLIMATES OF NORTH AMERICA



- " " " " » Isotherms (in degrees Fahrenheit) expressed at sea-level
 |||| Regions with lowest actual temperature (below ~32°F.)
 —> Warm currents _____ v Cold currents

FIG. 12. JANUARY TEMPERATURE CONDITIONS : WINTER

latitude the coastal temperatures are much higher than those of the interior.

In connexion with oceanic influence

NORTH AMERICA

currents must be considered. Part of the North Equatorial Current, driven west by the north-east trades, enters the Caribbean Sea and Gulf of Mexico. Emerging through Florida Strait, the surplus waters join the other and more direct branch of the same current, and together they form the warm Gulf Stream. The Gulf Stream flows north-east near the coast, until off Newfoundland it meets the Labrador Current, and its strength is broken. Then some of its waters merge in the North Atlantic Drift, which is blown across the Atlantic towards Europe by the westerly winds. The warm, moist air over the Gulf Stream mingles with the cold air above the Labrador Current, which flows south through Davis Strait and bears many icebergs, especially in spring and early summer. This explains the frequent and dense fogs of the Grand Banks of Newfoundland. Some of the cold water of the Labrador Current sinks beneath the warmer waters of the Gulf Stream, and reappears along the east coast of the United States as far south as Cape Hatteras, forming what is known as the Cold Wall.

In the Pacific Ocean the West Wind Drift sends one branch north along the coast of British Columbia and Alaska. This drift is warm relative to the waters it enters. A second branch of the West Wind Drift turns south, where the north-east trades carry it along the coast of California into waters warmer than itself; it is, therefore, a relatively cold current.

The January map indicates that the west coastal belt of Canada and the United States is much warmer than the east coastal belt, although both are exposed to a broad ocean. The difference is explained by the winds and surface currents. The west coast receives warm westerly winds from the Pacific. In western Canada this warmth is increased by the m current. The east coast is subject to ¹ the blow out towards the Atlantic or ^v from the cold interior of the continent. The influence of the Gulf Stream is

THE CLIMATES OF NORTH AMERICA

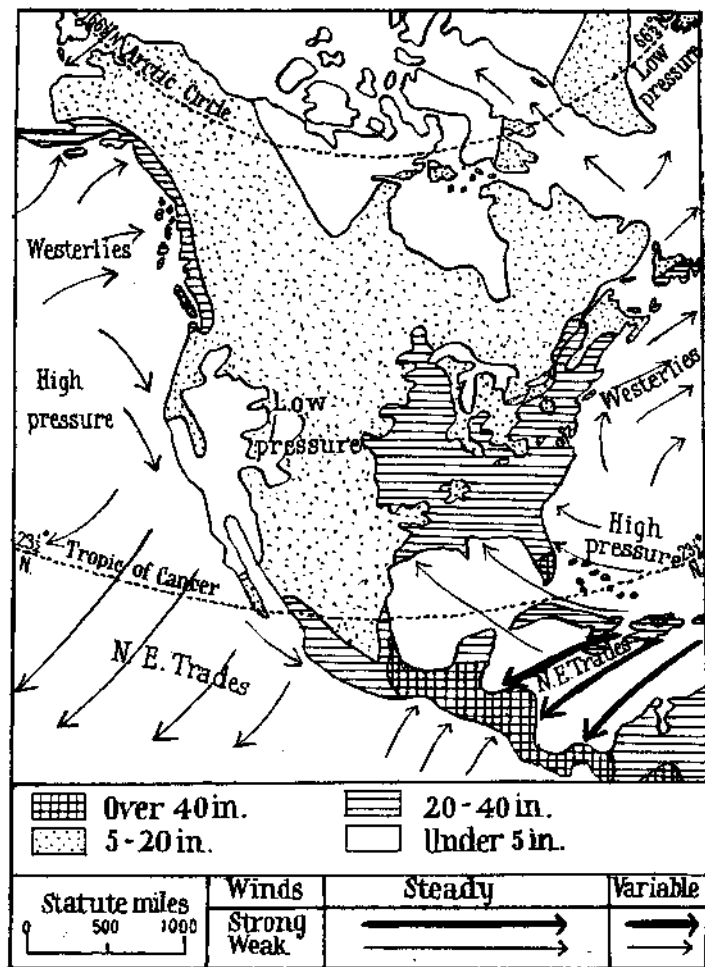


FIG. 13. RAINFALL FROM MAY 1 TO OCTOBER 31 (SUMMER)

revealed by the slight northward bend of the isotherms on the Atlantic, but the frequent off-shore winds prevent its

NORTH AMERICA

having much influence on the land, and encourage the upward welling of cold waters by blowing away the surface waters.

In summer the influence of winds from the sea is a cooling one, and cold currents have a marked effect upon temperature. Most of the continent has in-blowing winds in summer, but *it* is important to notice that in the temperate zone oceanic influence is only slightly cooling in summer, but enormously warming in winter. Two cold currents have a pronounced influence, revealed in the southward bend of the isotherms: on the west coast the California Current, on the east coast the Labrador Current, both of which cause frequent fogs that shut out much of the sun's warmth.

The western mountains restrict the influences of the Pacific to a narrow coastal belt, and at the same time shut off the cold winter air of the interior. The Atlantic Highlands are lower, less broad, and do not form a continuous barrier. The absence of west-east highlands gives exposure to Arctic and tropical winds, so that 'cold snaps' and 'heat waves' are common in the plains, where sudden and great temperature changes are by no means uncommon. The severe cold of the Canadian winter may come south to the Gulf of Mexico, or the tropical summer heat may spread to Central Canada. On the high plateaux the clear, thin air results in very high temperature during the summer days, followed by rapid cooling at night.

Particular attention should be paid to two isotherms: 32⁰ F. in January, which indicates the region in which prolonged frosts are likely to occur and the waters that are normally icebound; and 50⁰ F. in July, which marks approximately the northern limit of trees.

RAINFALL

The distribution of rainfall depends mainly upon winds and the position of highlands. Winds are caused by differ-

THE CLIMATES OF NORTH AMERICA

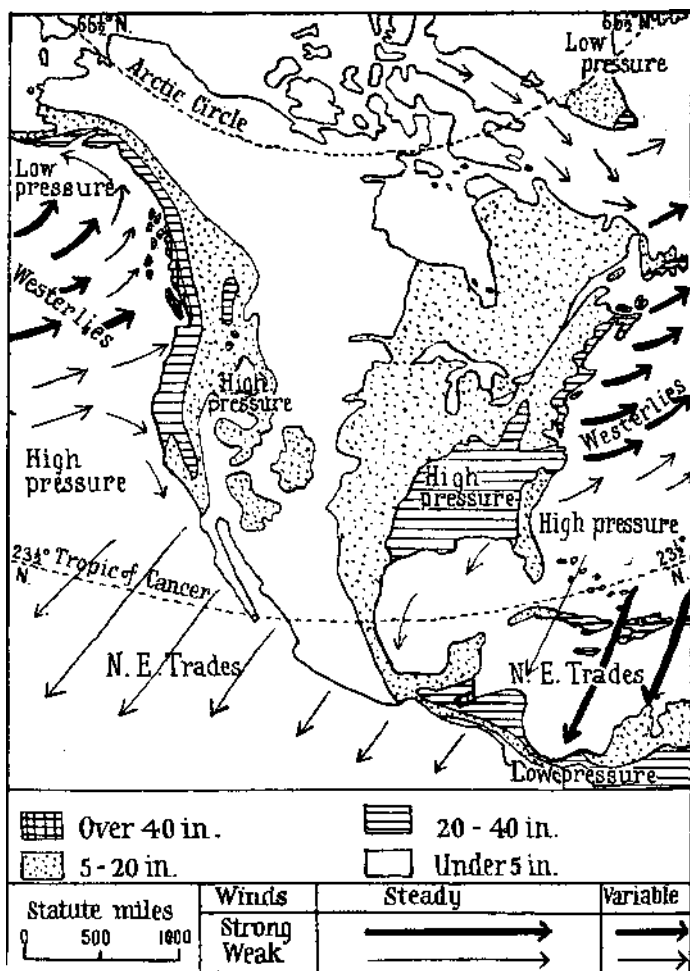


FIG. 14. RAINFALL FROM NOVEMBER 1 TO APRIL 30 (WINTER)

ences of atmospheric pressure. In a region of high pressure the air is denser, and presses down with a greater weight

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on a given area than it would in a region of low pressure, where the air is less dense, and has less weight. There is thus a tendency for a wind to blow from where there is dense air—*i.e.*, high pressure—to where there is light air—*i.e.*, low pressure. The origin of winds may be understood from the simple diagram (Fig. 15), which compares the behaviour of the atmosphere with that of liquids.

The heart of the continent in summer is a region of heated, expanded air, resulting in low pressure, towards

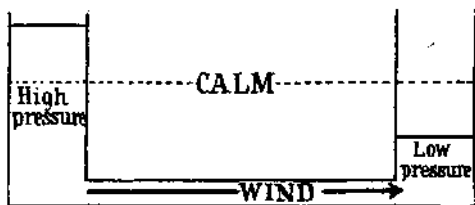


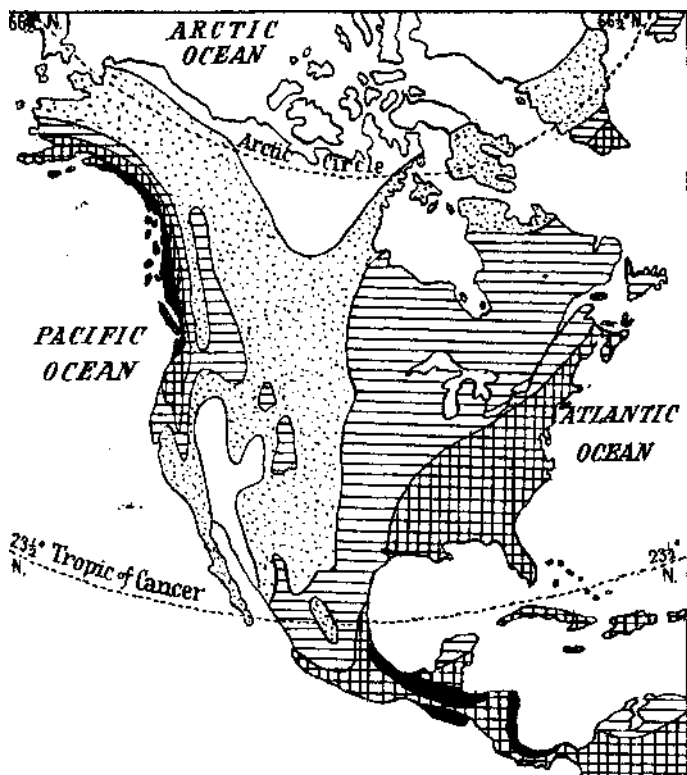
FIG. 15. THE ORIGIN OF WINDS COMPARED WITH THE BEHAVIOUR OF LIQUIDS

Liquid would flow from the higher column to the lower until the columns had the same level, and there would be no further flow. In the same manner air flows from a region of high pressure to one of low pressure. Uniformity of pressure brings a calm.

which winds blow from the cooler, denser air of the surrounding oceans. In winter winds blow out from the cold, dense air of the continental interior to the warmer, less dense air over the oceans. North America has, therefore, a more widespread distribution of rainfall in summer than in winter, and a considerable area—the centre, south-east, and south—has its seasonal maximum in summer, when a wet monsoon wind blows far into the continent from the Atlantic and the Gulf of Mexico. The monsoonal character of the climate is nothing like so strongly developed as that of the much larger Eurasian continent.

The northern half of North America, like Western Europe, lies all the year in the belt of westerly winds, which give abundant rainfall and heavy winter snows to the mountainous western coasts. There are well-marked

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m Over 80in. (heavy)

| g g 40 - 80 in.(abunulaat)

\=f 20-40 in., (ample)

yj 10 - 20 ki. (scanty orligMi

0 500 1000]

r ~1 Under 10in.fdesert or semi- desert) statute miles

FIG. 16. MEAN ANNUAL RAINFALL

'rain shadows'—regions of much lighter rainfall—on the leeward side of the mountains, while the central plains beyond receive practically no rain from the Pacific.

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California is a region of 'Mediterranean' climate: it receives nearly all its rainfall in the winter half of the year, when the westerly winds move south, following the apparent migration of the sun. The enclosed plateau-basins of the United States receive scanty rainfall, owing to the high flanking ranges.

The Great Lakes and St Lawrence region receives rain (with which snow is included) at all seasons, much of it from cyclones, the 'depressions' which occur at irregular intervals like eddies in the stream of westerly winds. Cyclones are probably more numerous in North America than in any other continent, and they cause changeable weather. The frequent anticyclones bring more settled weather. Eastern Canada has a particularly heavy snow-fall.

Central America, Mexico, the West Indies, and the south-eastern part of the United States receive rain from the north-east trades, but their maximum rainfall comes in summer, when there are strong ascending air currents over the heated land, and frequent thunderstorms. Much of the rainfall of the south-eastern section of the United States, particularly in winter, is due to the frequent passage of cyclonic depressions in the Gulf of Mexico, off the Atlantic coast, and up the Mississippi Valley.

Cold ocean currents chill the air, so that it cannot hold much water-vapour, but warm currents supply air heavily charged with moisture. These facts partly explain the heavy rainfall of the south-eastern parts of the United States, where the Gulf Stream flows, and the low summer rainfall of California, where the cold California Current is found.

Certain special climatic features must be mentioned. The blizzards of West Central Canada and the adjoining part of the United States are cold waves in which there is a howling gale of wind, driving along clouds of dry, powdery snow, fatal to anyone exposed to their fury.

On striking the slopes of the Pacific mountains the

THE CLIMATES OF NORTH AMERICA

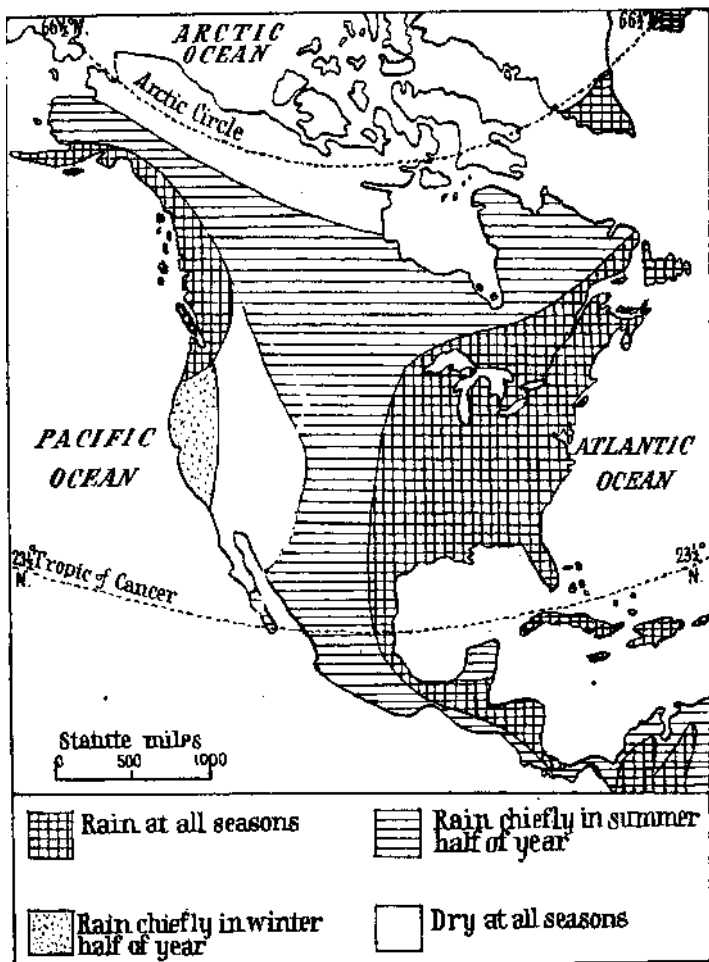


FIG. 17. THE SEASONAL DISTRIBUTION OF RAINFALL

westerly winds are driven upward, expand, cool, and give rainfall.

On descending the leeward slopes the winds are

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heated¹ by compression, so that they can hold more moisture. These warm, dry winds are known as Chinook, or *Fohn*, winds. They have a moderating effect upon the winter climate of the western plains, and cause sudden upward leaps in temperature—perhaps 40° F, in fifteen minutes. The warm breath of the Chinook evaporates snow with great rapidity, so that the grasses are rarely covered for long. In summer the Chinook is a scorching, oppressive wind.

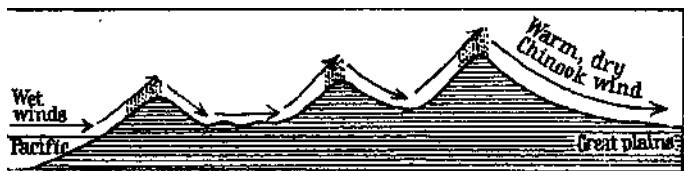


FIG. 18. THE ORIGIN OF CHINOOK WINDS

Note the contrast between the wet windward slopes and the dry sheltered valleys and leeward slopes.

All the United States east of the Rockies, but especially the Central Mississippi Basin, are subject to destructive storms called tornadoes, which sweep over the land, most frequently in hot weather. The only good points about a tornado are its smallness and its brief duration. It is a tiny cyclone, perhaps a quarter of a mile, or even less, in diameter. The centre is a region of violent ascending currents of moist air, producing a dense, funnel-shaped cloud. The great difference in pressure between the centre and the margins produces winds of astounding violence, capable of uprooting trees, shattering buildings, and picking up human beings to dash them to death. The whirling funnel of cloud advances east or north-east at twenty to forty miles an hour, with a deafening roar, and should a town lie in its path a trail of chaotic destruction

¹ Latent heat released when the water-vapour is condensed on the windward slopes also helps to raise the temperature of the descending winds.

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will mark its passage. A tornado usually dies out after travelling about twenty miles.

During certain months, especially August, September, and October, the West Indies and the south-east coasts of the United States are subject to violent tropical cyclones, with diameters of fifty to 300 miles, known in America as hurricanes,¹ which approach from the east, turn north, and finally east. On an average only about six or eight occur during a year, but they often do immense damage to human life and property, and may completely destroy towns, accomplishing much more widespread destruction than the small tornadoes.

EXERCISES

MEAN MONTHLY TEMPERATURES (IN DEGREES FAHRENHEIT)²

PLACE	J.	F.	M.	A.	My.	Jn.	Jy.	Aug.	S.	O.	N.	D.
Dawson City .	- 23-9	-13'5	3-0	28-2	47-5	57-9	59 7	54-8	4*1*9	27-1	- 0 7	-9-8
Victoria	39-2	40'3	43*1	47 7	53.0	57'i	60-3	60*0	55'6	50-4	44*5	41*5
Winnipeg	-3-5	-0-5	111	38 7	51-5	62-6	66 2	62 7	54-1	41-6	22'0	7-2
Halifax.	2 41	23*9	31*5	40* 1	49'3	57-6		64-6	58-8	48-8	3 9 7	29 3 i
New York	3 0 3	30-6	3 7 7	48*5	59'4	69-0	74-5	72-8	65'9	55*2	44-1	34*2
Salt Lake City •	29-0	33 4	4i-3	49-8	57-4	66-9	75*5	74-5	64-4	52-3	40*6	32 a
1 San Francisco	49 5	51*3	52 7	53 7	55-5	57-0	57'3	58-0	59*3	58-4	55'5	50-9
Yuma .	54 7	59 2	64 5	70 1	76-8	84 7	90-9			72-4	6i*o	55 7
Vera Cruz	71-4	73-2	74-8	79-0	81 -o	8i-5	81 7			76-5	74-8	70-9

MEAN MONTHLY RAINFALL (IN INCHES)²

PLACE	J.	F.	M.	A.	My.	Jn.	Jy.	Aug.	S.	O.	N.	D.	ANNUAL TOTAL
Dawson City .	1'0	0 7	0-6	0 7	1'0	IT	1-8	i-6	1-9	i*3	1'2	1 1	14*0
1 Victoria .	4*5	3*5	2*5	1 7	1*3	0-9	0-4	0-6	2'0	2*5	6*5	5*9	32*5
i Winnipeg	0-8	0 7	1'2	i*5	2'1	3*0	3*2	2-2	2 T	i*4	1'0	0-9	20'2
Halifax .	6-0	4 7	5*1	4*6	3*8	3*8	3 7	4-6	4*1	5*5	5*9	5*5	57*3
New York	3*3	3*3	3*5	3*3	3 5	3*4	4*1	4'4	3*4	A±	3*6	3*3	42-5
Salt Lake City ^b	1*3	i*5	2*0	2'1	2-2	0-8	0*5	0-8	0*9	1*4	1*4	1*4	16*3
San Francisco .	4*8	3*6	3*3	1 7	"07"	0	0	0	0*3	1'0	2-6	4 7	22 7
Yuma	0-4	0-5	0-4	0'1	0	0	OT		0-2	0-2	0-3	0 4	3-1
Vera Cruz	0-4	0-6	0-6	0'1	4*3	12'5	14*8	8 9	11-6	9-0	3*2	2'0	68-0

¹ Known as cyclones in the Indian Ocean, typhoons in the China Seas.

* From W. G. Kendrew's *Climates of the Continents*.

⁻⁸ Altitude above sea-level, 4366 feet.

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i. Represent the above temperature and rainfall figures in diagram form on squared paper. State the range of temperature in each case.

2. Point out and briefly explain the climatic contrasts of (a) Dawson City, Yuma, and Vera Cruz, (b) Victoria, Winnipeg, and Halifax, (c) San Francisco, Salt Lake City, and New York.

3. Point out the most important climatic differences between North and South America.

4. What important climatic changes would result if the Western Cordillera stretched from west to east across the middle of North America (about 40° N.- 50° N.), instead of being in their present position?

CHAPTER IV

NATURAL VEGETATION, NATIVE ANIMALS, AND ABORIGINAL PEOPLES

The natural vegetation map should be studied with constant reference to maps showing relief, temperature, and rainfall, for the natural vegetation is an expression of the rainfall and temperature conditions, modified in a minor degree by soil conditions.

THE FORESTS

1. *The Tropical Forests.* The lowlands of Central America, Southern Mexico, the West Indies, and Southern Florida are sufficiently hot and wet to support tropical forests, in which there are many varieties of palms, lianas (climbing plants), and epiphytes (plants that grow on others). Among the many valuable products are mahogany, ebony, rubber, bananas, cacao, vanilla, and dyewoods. The low-lying coasts are generally fringed with mangrove swamps. The mangrove flourishes on muddy flats, its roots rising above the mud before joining together to form the trunk. Mangrove bark is a source of tannin. The animal life is typical of hot, wet forests: gaily coloured parrots, parakeets, macaws, and humming-birds; butterflies and other insects; snakes, monkeys, alligators, crocodiles, and tapirs.

2. *The Eastern Temperate Forests.* In the region extending roughly from latitude 50° N. in Canada to the Gulf of Mexico, and stretching from the Atlantic almost halfway across the continent, there is sufficient rainfall throughout the year (there is no dry season) to support

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trees. Over the greater part of the region there are be deciduous trees, whose leaves fall in autumn,¹ and co ferous (cone-bearing) trees, while in the southern part t warmer winters are reflected by the presence of fore of broad-leaf evergreen trees—there is no cold season check their growth. Over much of the region the fore, have been cut down on a large scale.

Around the Great Lakes and St Lawrence Valley a in New England the mixed forests form one of the rich timber tracts of the world. On sandy soils various spec of pine (yellow, pitch, Weymouth) predominate; wetter grounds there are cedar and hemlock-spruce; the richer, deeper soils the conifers are intermixed w oak, chestnut, birch, beech, hornbeam, walnut, hicko plane, ash, elm, and lime. One of the most picturesq trees is the maple, the leaf of which is the emblem Canada. The autumn tints of the fading leaves of i maple—especially the sugar-maple—are unusually bi liant and beautiful. Timber, wood-pulp, turpentine, res tar, and maple-sugar are typical products of the regioi

The Appalachian Ranges and their margins still preseel traces of their former wealth of timber, especially on t mountains. The trees are mainly deciduous (oak, walm chestnut, elm, plane, maple), with conifers (chiefly pin< on the drier and poorer soils and the higher slopes. T undergrowth is wonderfully rich in flowering shrubs, such rhododendron and magnolia, while the Virginia creeper ac its flaming colours to the autumn beauty of the forests.

The wapiti, red deer, and the Virginian deer, with huge antlers, are found in these forests. There are a foxes, weasels, beavers, squirrels, and many other sm animals, and birds.

3. *The Northern Coniferous Forests*, The greater p: of Canada is covered with a belt of coniferous fores

¹ In Canada and the United States autumn is appropriately cal
•the fall/

² Sometimes called *Taiga*, the Russian name for the Siberian fore



FORESTS	Tropical	 Mediterranean. evergreen
	Northern coniferous	
	Eastern temperate	
	 Mountain	
DESERTS	Semi-desert or scrub	
	Cold or ice desert	
	Thiehot desert	

FIG. 19. THE NATURAL VEGETATION OF NORTH AMERICA

100 miles from Atlantic to Pacific area
 ITOS in breadth. Over almost the whole region-
 's long and severe, summers bright and warm,
 and rainfall rather light. The soils are mainly glacial
 deposits of sand, clay, or gravel. The conditions are
 therefore much more suited to the hardy evergreen

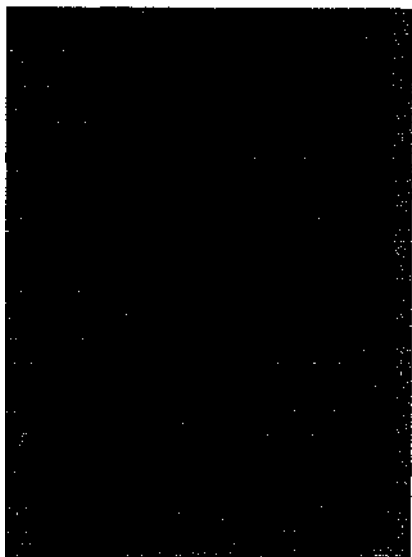


FIG. 20. A CANADIAN BULL-MOOSE

The moose, or elk, is the largest of the deer
 tribe. Moose are numerous in the Canadian
 forests, from the Mackenzie to the St Lawrence,
 and are frequently hunted by sportsmen.

By courtesy of the Canadian Pacific Railway

conifers than the broad-
 leaved, deciduous trees.
 The northern section of
 these forests, extending
 in the Mackenzie and
 Yukon Basins well be-
 yond the Arctic Circle;
 is of a scattered type;
 only on the alluvial soils
 along the river-banks
 does one find real
 forests. Elsewhere hi
 the north the trees are
 widely scattered among
 lake-dotted moorlands,
 swamps, and meadows,
 and in the extreme
 north are stunted. Thj
 conifers are admirably
 adapted to the cond
 tions of soil and climate.
 The heavy snows act as
 a blanket over the roots,
 and to a certain extent

on the branches, protecting the trees from the full effect
 of winds. The accumulation of too great a weight of
 "snow upon the branches is prevented by the conical shape
 of the trees. In spring the melting snow provides moisture
 just when it is most needed for growth. Finally, the
 needle-leaves of the conifers prevent rapid loss of moisture
 in sunshine or drying winds.

ETATION, A

Perhaps the most remarkable _____ he Canadian coniferous forests is the small number of species. Generally there are extensive tracts of only one kind of tree, in strong contrast with the great variety of the equatorial forest. The chief types of conifers are spruces (white, black, and red), balsam fir, pines (white, grey, and

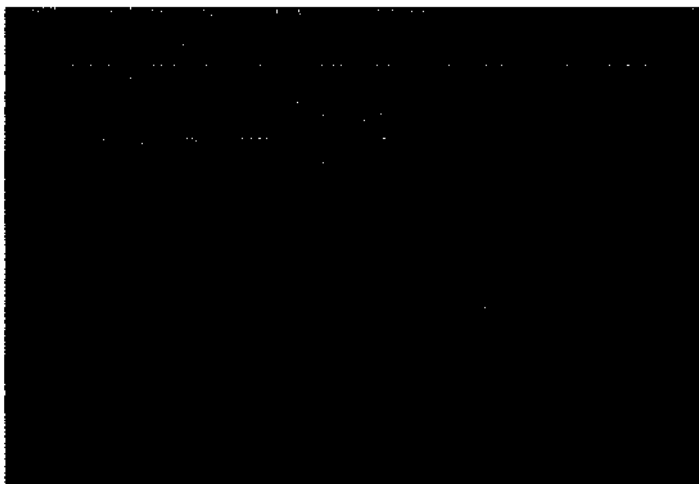


FIG. 21. A HERD OF CARIBOU, ALASKA

Caribou are a wild species of reindeer, and, unlike all other deer, both male and female have antlers.

By courtesy of the Canadian Pacific Railway

Ji, hemlock, larch, and aspen (known in Canada as lar).
tost of the timber of the northern forests is only suitable for wood-pulp. The animal life of the region furnishes
^T|ther source of wealth. The forests afford a good supply
•food in their twigs, leaves, nuts, berries, seeds, and even
_Jp in winter, in which season the shelter of the trees is
Pan^Jditional advantage. There are large animals, such
bis elk, or moose, the caribou, or wild reindeer, and

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bear. Among the rodents, or gnawing animals, are the beaver, hare, porcupine, and various kinds of squirrel. Birds, such as grouse, woodpeckers, and jays, are numerous. The most valuable animals are those yielding furs.

On the Coast Ranges of Alaska, British Columbia, and their island fringes temperature conditions are so mild, and rainfall so abundant, that the conifers are the most magnificent in the world. There are spruces and cedars, in addition to the gigantic Douglas firs^x of British Columbia, which have a diameter of from eight to fourteen feet at the base, and in some specimens attain a height of 300 feet. These forests furnish huge quantities of timber, and abound in animals, including wild sheep.

4. *The 'Mediterranean' Evergreen Forests.* California is a region of summer drought and winter rainfall. The winters are mild, and, although the summers on the coast are cool for such latitudes, the temperatures inland are much higher. The Californian region is therefore of Mediterranean type. The sheltered Californian Valley has a park-like appearance; among stretches of grassland there are large numbers of evergreen shrubs, laurels, cypresses, and evergreen oaks. Thorny bushes and trees with small, leathery, prickly leaves and long roots, capable of resisting excessive evaporation during the summer drought, are typical of the region. The olive, grape-vine, mulberry, orange, and other fruit-trees of the Mediterranean lands of the Old World also flourish in California. On the mountain slopes there are trees rivalling in size those of British Columbia. The most noted species are the red-wood pines and the 'big trees' of the Sierra Nevada, which are now protected against further destruction. The animal life of the region is similar to that of the northern forests.

¹ The flagstaff of Kew Gardens is a splendid specimen of Douglas fir from Vancouver Island, presented by British Columbia, and erected in 1919. It is 215 feet high, and weighs 18½ tons. The origin*¹ tree must have been much taller.

VEGETATION, ANIMALS, ABORIGINALS

THE GRASSLANDS

The grasslands naturally occur in regions of lighter rainfall, and, usually, more rapid evaporation, where the lack of permanent moisture in the subsoil makes it difficult for trees to live.

i. *The Savannas, or Tropical Grasslands.* For the best example of a savanna land one must look to North Africa, where—in the Sudan—constant heat, accompanied by a wet season (northern summer), and a dry season (northern winter), favours the development of grasses. But in North America the region corresponding to the Sudan is extremely small, owing to the narrowness of the continent within the tropics. Indeed, the only area of savanna that is at all extensive is in the north of the low plateau of Yucatan, where the porous limestone reduces the value of the rainfall, and supports only a kind of savanna, which passes to dense jungle where the rainfall increases farther south. The most useful plant of Yucatan is sisal, from which a fibre, sisal hemp, is obtained.

2. *The Steppes, or Temperate Grasslands.* There are two extensive areas of temperate grassland: the prairies and the Mexican Plateau. Broadly speaking, the prairies cover the land between the meridian 100° W. and the eastern slopes of the Rockies¹—the very heart of the continent, far from the oceans. In general they are a region of flat or undulating plains rising imperceptibly to the foot of the mountains. Summers are hot, and winters cold or cool; but the chief feature of the climate is the light rainfall, falling chiefly in the growing season, and rarely exceeding twenty inches a year. The prairies form a treeless land, in which the chief plants are short grasses, such as buffalo-grass, grama-grass, and prairie-grass, with dry, wiry blades. Only along the riversides does one find trees: oak, elm, walnut, lime, etc. On the eastern side the prairies increase in luxuriance, owing to increasing

¹ The Great Plains are included in this account of the prairies.

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rainfall, with tall _____s and many flowers, and merge into the eastern tall-grass forests through a broad parkland of grasses intermingled with trees. In the drier parts of the west, and on porous soils, scattered tufts of bunch-grasses and drought-resisting plants, such as dwarf cacti and the agave, or prickly pear, are common.

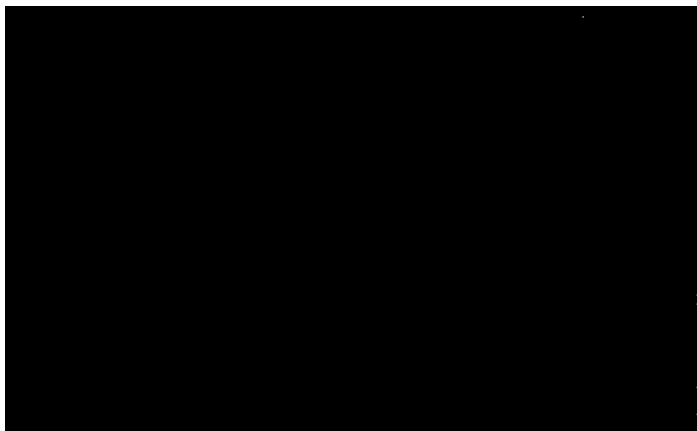


FIG. 22. BISON IN BANFF NATIONAL PARK
The Rockies rise abruptly from the western edge of the Great Plains.
By courtesy of the Canadian Pacific Railway

On the foothills of the Rockies the characteristic vegetation is sage-brush, consisting of small, dry bushes smelling like sage—a natural protection against grazing animals.

The southern part of the Mexican Plateau is narrower and higher than the north, and its moderate summer rainfall supports wiry bunch-grasses, with occasional groves of low trees. On the numerous lava-sheets are cacti, agaves, and similar thorny bushes.

The animal life of the grasslands is of course adapted to

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the geographical conditions. During the wet growing season there is an abundance of grasses; at other times, especially during periods of drought, there is a shortage of pasture. Hence there are animals which live together in large herds, moving about from one pasture to another: such animals naturally develop speed. ^Animals are more exposed to dangers on the open grasslands than in the forests, and the possession of keen senses is a further protection. The chief animal of the prairies was the bison (wrongly called 'buffalo'), a large species of wild ox, with massive fatty shoulders, shaggy hair, and small hind-legs. The bison roamed the prairies in immense herds, but to-day only a few remain in special reservations. The rest were killed off rapidly by Indians and white settlers, and their place was taken by domesticated cattle, horses, and sheep, formerly unknown in America. Another important animal belonging to the prairies is the prong-buck, a kind of antelope.

Rodents are common in the prairies. Many protect themselves by living in burrows underground. The marmots,¹ rabbit-like animals with fat bodies and short legs, look very quaint as they sit up on their hind-legs. In winter they sleep soundly in their burrows. The jumping-mouse possesses short forelegs for burrowing, but its back-legs and tail are long and strong, to enable it to bound along, like a miniature kangaroo. Of the birds, perhaps the chief are the prairie-hen (a kind of grouse), the sage-cock, and the prairie-chicken.

3. *The Arctic Grasslands, or Tundra.*² The coastal lowlands of Greenland, Northern Canada, and Alaska, are occupied by tundra, formerly, but not correctly, known in Canada as the 'barren lands.' The climate of the tundra is characterized by very long, intensely cold, dark winters, during which the sun is little seen, but the atmosphere is

¹ The American marmot is sometimes called the prairie dog, or gopher.

² *Tundra* is the Russian name for treeless lands in high latitudes.

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remarkably clear and dry. The rivers, lakes, and sea are frozen. The summer is short but bright, with almost continuous sunshine from a sun that is low in the sky. The snows melt, rivers, lakes, and seas are free from ice, and the ground is thawed to a depth of about one foot, below which it is permanently frozen for many feet. Despite the small precipitation in the form of snow or rain there is plenty of water available during the warm season, when lakes, pools, swamps, and streams are common features of the landscape. Long-rooted plants cannot grow, and the chief vegetation is mosses, lichens, and dwarf bushes, such as evergreen rhododendrons, birches, willows, crowberries, bearberries, and cranberries. In favourable spots, such as the southern slopes of hills, facing the sun, there are in summer carpets of beautiful flowers: saxifrage, Arctic poppy, buttercup, harebell, gentian, etc., which rapidly complete the full cycle of life during the almost continuous sunshine, and leave their seeds to germinate in the following summer.

In the Mackenzie Basin the coniferous forests penetrate beyond the Arctic Circle almost to the ocean, but round Hudson Bay the tundra stretches far south, to about 60° N, the latitude of the Shetland Islands, the southern limit being approximately the July isotherm 50° F.

The tundra is by no means a barren wilderness. Its plant life is sufficient to support a fair variety of animal life, although still more animals are dependent upon the sea for their food. The mosses and lichens are available even in winter, and so form permanent pastures. The caribou and the musk-ox feed on lichens, willow leaves, and grass, easily reaching the plants in winter by scraping away the light snow. The domesticated reindeer of the Old World has been successfully introduced into Alaska. There are rodents, such as the Arctic hare and the lemming, a tiny animal not much bigger than a mole. Among **the** flesh-eating (carnivorous) animals there are the wolf and its near relative the Eskimo dog, and the Arctic fox

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and ermine, both of which protect themselves from possible enemies, and render themselves less conspicuous to their prey, by becoming white in winter to match the snow.

In summer thousands of birds—gulls, geese, ducks, etc.—migrate to the tundra, returning to the warmer south on the approach of winter, but the most typical bird is the ptarmigan, or snow-grouse, which becomes white in winter, and commonly stays in the tundra all the year. Undoubtedly the worst feature of the tundra in summer is the huge swarms of mosquitoes that plague mankind. The mosquitoes lay their eggs in stagnant waters, so widespread in summer. The eggs survive the severe cold of winter, and hatch out in the following summer. After a brief period in the water the creatures emerge in great swarms as full-grown mosquitoes. There are, in addition, many flies, bees, and butterflies. Of the Far Northern animals that depend upon the sea for their food the most important are the polar bear, seal, walrus, and whale.

THE DESERTS

I. *The Hot Deserts and Scrublands.* North of the Gulf of California the land surrounding the Colorado river is a region of burning heat, dry, clear atmosphere, and almost complete drought. The desert conditions extend south on either side of the Gulf, while farther east the basin of the Rio Grande del Norte, in Texas, New Mexico, and the northern part of the Mexican Plateau are also desert regions. The intermontane plateaux of the United States are scrublands. In all these regions there is a remarkable development of drought-resisting plants: cacti, mimosa, acacia, and agave, often weird and fantastic in shape, with their swollen, fleshy, thorny stems. Salt-bush and sagebrush are common in the scrublands.

The Llano Estacado, or "Staked Plain" of North-west Texas and New Mexico is a kind of intermediate zone

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between prairie and desert. Among the short grasses there are the usual desert plants, besides many bulbs and tubers, with swollen, water-storing roots. Because of the scarcity of water the early routes were marked out by wooden stakes set upright in the ground—hence the name "Staked Plain/¹

Large animals find it difficult to live in deserts or scrublands, and the chief creatures are insects and reptiles, such as snakes and lizards. In some of the arid regions, however, there are antelopes, rabbits, and coyotes (prairie wolves).

2. *The Cold Desert.* The high plateau of Greenland is permanently capped with a thick sheet of ice, from which glaciers descend to the coast. Much of Baffin Land and some of the other Arctic islands of Canada are regions of cold desert, snow-clad and ice-bound for the greater part of the year.

THE WESTERN MOUNTAINS

In the western mountains there are great variations in natural vegetation, dependent upon temperature changes due to altitude and to variations in rainfall. The western slopes are much wetter than the eastern, and rainfall on the whole diminishes from north to south, and from west to east. The western slopes of the Coast Ranges, Cascades, Sierra Nevada, and Rockies are clad with fine forests of conifers: pines, spruces, firs. The drier eastern slopes support only scattered forests of smaller trees, mainly pines, while beyond San Francisco, increasing dryness is reflected in the chaparral, a densely tangled brushwood.

The sheltered intermontane plateaux are drier than the mountain ranges on their flanks. In Alaska and British Columbia the plateaux are park-like; there are grasslands interspersed with spruce, aspen, and pine. In the United States there is a change from the grasslands of the Columbia Basin to the much more arid region that extends south through the Great Basin and the Colorado Plateau

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into Mexico. This extensive region is largely semi-desert, the chief plants being sage-brush, salt-bush, and coarse grasses.

In the western mountains there live the puma, or American lion, which preys upon the wild Bighorn sheep; the powerful grizzly bear; the brown and cinnamon bears; and the Rocky Mountain goat.

THE ABORIGINAL PEOPLES OF NORTH AMERICA

It is thought that the natives of North America originally came from Asia. Eastern Asia is separated from North America by the narrow Bering Strait, and the shallowness of the Bering Sea and the chain of Aleutian Islands indicate a former close connexion between the two continents. Despite certain variations in type, the North American Indians have the following common traits: the skin is a yellowish-brown, with an undertone of coppery-red; the hair is long, straight, and coarse, but absent from the face; the cheek-bones, nose, and jaw are usually prominent. These characteristics recall the Mongol peoples of Asia.

Indians of the coasts and islands of Alaska and British Columbia are fishermen and hunters of deer, wild sheep, bears, foxes, and wolves. Farther south, in the arid lands of the Great Basin and Colorado Plateau, live the Pueblo Indians, so-called because they live in fortress-like dwellings known as *pueblos*.¹ A *pueblo* is usually semicircular or oval, constructed in terraces round a central courtyard. The outer wall is high and devoid of windows, making defence an easy matter. The whole *pueblo* is built of adobe,² a sun-dried mud-brick, and provides shelter for many families—perhaps as many as 5000 people—all of which take part in the cultivation of the common land. This is very carefully irrigated; indeed, the way in which

¹ *pueblo* (Spanish) — 'town.' .

² Pronounced 'a-do-be.'

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they raise crops of corn and cotton in such a dry region is little short of miraculous. In some cases the *pueblos* were built on top of flat-topped *mesas*} places easily defended, and free from the overpowering heat and dust of the plains. At one time the Pueblo Indians lived in fortified caverns in the steep slopes of the *canons* of Colorado. Some Indians in Arizona and New Mexico still live in caverns and under the ledges of cliffs.

The taU, magnificently developed Indians of the plains were widely scattered in various tribal groups. Of these the strongest were the Algonquin-Iroquoian group, who inhabited the most strategically important part of the continent, especially the Iroquois round Lakes Erie and Ontario, since they held the Mohawk valley, the great gateway to the interior. They had developed a certain amount of agriculture to supplement their hunting and fishing, and grew maize, beans, melons, pumpkins, and tobacco. They offered the fiercest resistance to the inroads of European settlers.

The Dakota and Sioux Indians of the prairies were mainly dependent upon the bison, which they hunted on foot: the horse was unknown in America before the coming of the Europeans. The bison was never domesticated, but roamed freely over the prairies in vast herds. As hunters, dependent on the bison for meat and for skins to make clothing and tents, the Indians had to journey long distances, following the bison when they moved to the high western plains in winter or migrated back to the prairies in summer. The usual Indian dress was a long coat, long leggings reaching from ankle to waist, and moccasins—soft, comfortable shoes—all made from the carefully prepared skins of deer and Rocky Mountain goats. A love of display was revealed in the decoration of dress with bright colours, porcupine quills, and human hair, and the wearing by chieftains of a headdress of feathers. The movable tent, or wigwam, consisting of

¹ See pages 199 and 201.

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several long poles covered with bison-skins, formed the usual home, but sometimes in winter a hut covered with earth might be built. Bows and arrows, stone tomahawks (axes), wooden spears and clubs, were the chief weapons. The use of the light, yet strong, birch-bark canoe, propelled by a single paddle, was common among all the Indians of the central and eastern plains. They frequently made long journeys by rivers and lakes, making use of portages to avoid falls or rapids, or to cross from one waterway to another. The introduction of the horse and rifle greatly increased the mobility and hunting powers of the Indians.

Compelled to live mainly by hunting and fishing, owing to the absence of animals fit for domestication and of grains, except maize, suitable for cultivation, the Indian developed remarkable skill and bravery, and wonderful powers of endurance, although in many ways he was cruel, treacherous, and merciless in his treatment of enemies. It is to be regretted that his worst characteristics were often called into action by the harsh treatment he received at the hands of Europeans: the humanity and kindness of the Quakers under William Penn secured the goodwill of the Indians, and preserved peaceful relations.

Hunting will not support a dense population, and when one recalls that some of the greatest crops—wheat, oats, barley, rye—as well as horses, sheep, cattle, and pigs, were all introduced from Europe, it is easy to understand why North America had a scanty population. This was fortunate, as it meant that North America was practically a vacant continent available for the surplus peoples of the densely populated countries of Europe.

The only part of North America in which there arose an advanced type of civilization was Mexico. Here the Aztecs on the plateau and the Mayas in Yucatan practised agriculture and irrigation with fine organization and skill. Mexico became a large, well-built city in the heart of a great empire. The chief products of the plateau were

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maize, beans, and cotton; the absence of domesticated animals was the most serious drawback.

In Mexico and Central America the natives have been more or less absorbed into the bulk of the population, but intermarriage between Europeans and natives in Canada and the United States has been unusual. The Indians



FIG. 23. INDIAN FUR-TRAPPERS MENDING A BIRCH-BARK CANOE

By courtesy of the Canadian Pacific Railway

were slowly but surely driven from their territories by the advancing tide of Europeans, and it seemed likely at one time that the Red Indian would completely disappear, annihilated by the weapons, diseases, and drink of the white man. Happily, however, attempts have been made to improve the lot of the natives, and in the United States their numbers have increased from 25,000 in 1870 to nearly 350,000 at present. The nomadic Indians found it difficult to take up settled occupations. It was therefore

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decided to set apart stretches of territory, known as Reservations, in which the Indians might live peaceful, settled lives. Of the United States Indian Reservations the largest is in Oklahoma State. Many of the Indians have become successful farmers, but on the whole the Reservation system has been unsatisfactory. The total area of Reservations in the United States in 1929 was 50,023 square miles, with an Indian population of 345,600. In 1900 the figures were 121,665 square miles, and 270,544 people.

In Canada there are over 100,000 Indians, many of whom live on special Reservations. Large numbers are hunters and fishers; some are engaged in fur-trapping, others in salmon canneries in British Columbia. A few Indians have become doctors, lawyers, teachers, or surveyors; still more have taken up farming. Probably in both Canada and the United States the Indians will in time become normal citizens, and cease to exist as a separate people, treated in a special way. They are being absorbed into the general population, but their numbers are too small to have much influence on national types.

In the far north of North America live the Eskimo,¹ occupying the coasts from the Bering Sea to Labrador, and the west coast of Greenland. A small number live on the east coast of Greenland and the Siberian side of Bering Strait. The entire Eskimo race only numbers about 30,000, most of whom live in Greenland. The great majority of the Greenlanders have some trace of European blood. Labrador has only 1000 Eskimo, Siberia 1600, and Canada about 7000.

It is remarkable that throughout their widely scattered homes the Eskimo are all of the same racial type,² and

¹ *Eskimo* means 'eater of raw meat.' The Eskimo call themselves *Tnnuit*, meaning 'the People'—i.e., the human beings who are really important!

² The blue-eyed, blond Eskimo discovered by Dr V. Stefansson, and thought to be descendants of the old Norse settlers of Greenland, are probably as pure as any other branch of the Eskimo race.

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speak the same language. They are a long-headed people, of a little below medium English height. Their skin colour is pale brown, or sallow. Their slanting, brown eyes, small, flat noses, prominent, rounded cheeks, and straight black hair recall the Mongols of Asia.

The Arctic coasts provide no vegetable food, no fibres, and no timber. The Eskimo must therefore live on animal food, his clothes must be of skins, his weapons of bone, and his dwelling of stone, peat, bones, or snow, and his heat and light secured by burning the melted blubber of sea animals. The only wood available is driftwood, washed ashore in summer, and treasured carefully for shafts of weapons and other purposes. Clothing is made of skins of seal, caribou, bear, fox, and hare. The women chew the skins bit by bit to make them supple, and sew them together with bone needles and sinew-threads, producing garments with watertight seams.

There are some tribes which live inland in Northern Canada and depend on the caribou. But the majority of the Eskimo are coastal peoples, dependent in the main upon seals. The seal and walrus are extraordinarily rich in fat, so essential for warmth in the cold Arctic lands. The blubber supplies fat for eating and oil for lighting and warming the dark winter hut, and also for cooking the meat.

In the brief summer the Eskimo does his utmost to store up food for the coming winter. He may journey inland in order to hunt caribou and musk-oxen. Salmon and other fish from the rivers, birds, birds' eggs, and berries are other sources of food. On such journeys in summer the home is a tent of sealskin stretched over a framework of driftwood. Should it be necessary to travel by water the Eskimo uses his excellently constructed canoe, the *kayak*. This has a framework of whalebone and walrus-bone, lashed together with sinews, and completely covered with sealskin, save for a hole just large enough to admit the man's body. This light canoe is easily propelled by a

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double paddle of wood or bone. A much larger boat, the *umiak*, may be used to convey the women and children, tents, weapons, etc., on their summer journeys.

On the approach of winter the Eskimo moves back to the sea-coast, where he has his permanent home. This is not, as is often supposed, a hut of snow, but generally of stone, or perhaps driftwood, the chinks carefully stuffed with peat and earth, which may also be used to cover the outside of the hut. There is generally a low tunnel entrance, which serves to shelter the dogs as well as keep out the biting cold. Oil-lamps of metal (obtained from traders) or stone provide dim light, and make the hut cosy and warm.

The mainstay of life in winter is the seal, which the Eskimo spears with his harpoon as it comes up to breathe at one of the air-holes it must maintain in the ice. Fish may be caught through holes in the ice, and occasionally a polar bear may be killed. In winter sledges are used, constructed of driftwood, with bone or wooden runners, the handles being caribou antlers. The sledges are drawn by dogs, harnessed with strips of skin. The dog is a most valuable possession. It is fed with seal-meat, but, in the absence of anything better, will devour fish, shell-fish, or seaweed. The Eskimo dog scents the presence of seals, and helps to round up musk-oxen and caribou. Should it be difficult to procure sufficient food in their home region the Eskimo may make a long journey to a better hunting-ground. The family with its possessions travels on sledges, and on arrival at the new hunting-ground builds a home of the only material available—snow. The snow-hut is like an overturned basin. The blocks of snow are cut and shaped with a bone knife. The dogs shelter in the tunnel entrance, and inside the hut the whole family sleep together in a row, lying between thick layers of skins. The *igloo*, as the hut is called, is surprisingly warm. The heat of a small fire, added to that of the oil-lamps, may raise the temperature to as much

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as 80° or 90° F., so that the Eskimo may sit stripped to the waist, yet perspiring!

Despite the constant struggle for the bare necessities of life—or perhaps because of it—the Eskimo are in general remarkably healthy, happy, and contented.

Contact with the white man has come mainly by way of fur-hunters and whalers, except in Greenland, and has been a mixed blessing. It has certainly given the natives better weapons for the hunt, but better weapons mean more effective hunting. In five years after opening trade relations the Copper¹ Eskimo abandoned bows and arrows for rifles, stone vessels for iron pots, and skins for canvas boats. The use of firearms has decimated the caribou in Greenland, the Mackenzie delta, Alaska, and elsewhere, and so reduced food resources and decreased well-being. The white man has also introduced new wants—tea, tobacco, sugar, soap, and other useful commodities. To acquire these the Eskimo sells skins which he ought to keep for adequate clothing. . . . Care is taken by Denmark, Canada, Newfoundland,² and the "United States, who control all Eskimo territory, that spirits are not introduced. But the advent of the white man has left a trail of diseases from which many tribes suffer badly.³

The Danes closed the ports of Greenland to foreign vessels many years ago, and it is claimed that the Greenland Eskimo, left to themselves, are increasing in numbers. But in Canada, Labrador, and Alaska, despite the efforts of the Governments, it seems possible that the Eskimo will die out through contact with the white man, and all that it has involved. This would be a serious tragedy, for the sturdy Eskimo could take a leading part in the future development of the Arctic lands as pastures for great herds of musk-oxen, reindeer, and caribou. Probably the most prosperous and happy Eskimo are

¹ So called from their use of native copper articles.

² Labrador is governed by Newfoundland, not Canada.

³ *The Polar Regions*, by R. N. Rudmose Brown (Methuen).

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those of the Mackenzie delta,¹ of whom a Canadian investigator² has recently written as follows:

It is perhaps not too much to say that as a people the Mackenzie Eskimo are exceptionally prosperous and happily situated. This is due to various causes. By long custom they are a very provident people. The sea, being within easy reach, supplies them with an abundance of seals and white whales during the summer; the rivers, as well as the sea, abound in the finest edible fish; while game birds and land animals provide a pleasing change of diet in season. A surplus of all these foods is laid aside to provide for times of scarcity.

The situation is also remarkable for the number and variety of valuable fur-bearing animals that may be taken. The district has been entered by individual traders as well as by the larger companies, so that there is a sharp competition for pelts. The Eskimo are shrewd traders, and drive keen bargains, with the result that they have become wealthy. No longer are they ignorant savages dwelling in snow *igloos* in winter, and forced to eke out a pitiful existence in a terrific struggle against all the forces of nature. The *igloos* have given place to comfortable winter dwellings of logs or rough lumber, in many cases finished with wall-board and dressed lumber.

White flour, sugar, butter, jam, canned fruit, and other luxuries are included in their diet. Long winter evenings are passed pleasantly listening to good music provided by expensive gramophones and radio sets. Brass and iron spring beds take the place of the old family couch of skins. Up-to-date sewing machines make the lot of the women easier.

Highly powered motor-schooners, costing from \$3000 to \$7000 each, provide floating summer homes as the people move about the delta or along the sea coast in search of sea animals or to visit the trading posts. Cameras, watches, thermos bottles, safety razors, high-powered rifles, and many other products of modern civilization are in general use. Practically all these Eskimo can read and write in their own tongue, and most of them have a fair grasp of English.

¹ See Fig. 77, page 280.

² W. H. B. Hoare; quoted in *The North-west Territories*, 1930 (Canadian Government).

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EXERCISES

- i. Contrast the northern coniferous forests of Canada with the selvas of South America, and with the coniferous forests of Siberia.
2. Describe and explain the changes in natural vegetation encountered on a land journey between San Francisco and New York.
3. Give an account of the various modes of life followed by the natives of North America before the coming of the Europeans.

CHAPTER V

CENTRAL AMERICA

CENTRAL AMERICA links together North and South America, but in structure is a distinct region, connected with the West Indies. In Central America and the West Indies the trend of relief features is east and west, representing the remains of an ancient continent, most of which is beneath the sea.

The seven countries of Central America have a total area exceeding 200,000 square miles, or roughly twice that of the British Isles. Between the depression of *the* isthmus of Tehuantepec (Mexico) and the still narrower isthmus of Panama Central America is very mountainous, except for the important east-west depression of Southern Nicaragua. Many fine volcanic cones, mostly extinct, rise in a long, broken line from the narrow coastal plain of the Pacific coast, only reaching the Caribbean coast where the land narrows in Costa Rica. Volcanic ash and soils weathered from volcanic rocks form fertile plains among the mountains and along the coasts, where they are inter-mixed with alluvium from rivers. The volcanoes and frequent earthquakes are alike evidence of crustal movements on a grand scale. Earthquakes are of much rarer occurrence on the Caribbean coastal plains, which are more extensive than those on the Pacific side. The general slope of the land is towards the Caribbean, into which flow several relatively long rivers. The narrower sections of Central America should be carefully studied, as they are followed by the chief lines of communication.

Central America lies within the tropics, so that the temperature on the plains is high all the year, with only

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a small range. The mountainous nature of the region results in reduced temperatures over a considerable area. The vital fact concerning the climate is that the mountains lie at right angles to the north-east trade winds. The eastern side is therefore wetter and less healthy than the high plateaux and Pacific coastal plain. In general there



FIG. 24. THE STATES OF CENTRAL AMERICA

are two climatic periods: the rainy season (summer), lasting for six months or more, and the hot, dry season. The southern part has an equatorial climate, two wet seasons alternating with two drier periods. Three climatic zones are recognized, (a) The *Terra Caliente* (Hot Land) extends from the coastal lowlands to about 3000 feet, and is forested with palms and other trees (mahogany, rosewood, rubber, cacao, logwood). On cleared lands there

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are plantations of sugar, bananas, coconuts, cacao, rubber, pineapples, cotton, maize, and tobacco, (b) The *Tierra Templada* (Temperate Land) extends roughly from 3000 to 7000 feet. In the wetter parts this region is forested with palms, tree-ferns, and bamboos, which give place with increasing elevation to deciduous trees, and finally to pine-forests. The drier parts are largely park savanna •—grasslands with scattered trees. Coffee is the chief cultivated product, and many animals are pastured. (c) The *Tierra Fria* (Cold Land), above 7000 feet, is a region of temperate grasslands, where animals are reared and some grain is cultivated.

From the sixteenth century until 1823 Central America—excepting the colony of British Honduras—was a Spanish colony, but in that year Guatemala became independent, and the rest formed the United States of Central America. In 1839 they broke up into separate republics, w^hich have persisted ever since. The population is by no means uniform. The Indian strain is strong, but the bulk of the people are of mixed blood: mestizos (European-Indian), mulattoes (European-negro), and zambos (negro-Indian). The unhealthy nature of the Caribbean lowlands explains why population is most dense on the plateaux and west coast. Many native languages and cultures still persist, but Spanish is the common tongue, and Roman Catholicism the dominant religion.

PANAMA

The small republic of Panama consists of the long, narrow isthmus connecting South and Central America. Balboa first crossed the isthmus to the Pacific in 1513, and the Spaniards at once recognized it as a vital link in their control of South America. With the adjacent part of Colombia, Panama has an early history which breathes the spirit of the Spanish Main, the treasure fleets, and the buccaneers. The Spaniards sent their Peruvian silver and

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gold from Panama City by pack-mules to Colon,¹ a route used in the middle of last century by men taking part in the Californian gold rush, and followed in 1855 by the first American transcontinental railway, made to give better connexion with the Pacific coast of the United States.

Panama declared her independence of Spain in 1821, and promptly entered into union with Colombia. Nearly a century later, in 1903, when negotiations broke down between the United States and Colombia with respect to the proposed construction of a canal across the isthmus, Panama Province suddenly proclaimed her independence, concluded a Canal Treaty with the United States, and accepted for herself the £2,000,000 offered for the Canal Zone. In addition, the United States pay £86,000 a year to Panama. Not until 1924 did Colombia recognize her old province as an independent nation.

The isthmus has two longitudinal mountain ranges, enclosing valleys and plains with excellent cattle pastures. The climate is hot and wet, the north-east trades from the Caribbean Sea and the deflected south-east trades² from the Pacific Ocean bringing heavy rains during most of the year. The mountain slopes are densely forested.

Panama, with an area of 32,380 square miles, is the size of Ireland, but its population of 467,459 (1930 census) is not much greater than that of Dublin. There were 78,000 whites, nearly 300,000 mestizos and Indians, and 70,000 negroes. The language of the country is Spanish, but English is understood in the ports of Panama and Colon.

Soil and climate combine to make Panama highly fertile, but so far only a small proportion of the forest lands has been cleared for cultivation. There are many flourishing banana plantations along the Caribbean coast, and

¹ The Spanish name for Columbus.

* On crossing the equator the south-east trades are deflected to the right by the earth's rotation (in accordance with Ferrel's Law) and become south-west winds.

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others are being established on the Pacific side. Bananas account for nearly half of the exports, the fruit going almost entirely to the United States. Cacao, coconuts, ivory-nuts, and other tropical products are exported, while sugar, coffee, and rice are grown for home consumption.

Minerals (gold, manganese), hardwoods, cattle, pearls, and turtle shell are other sources of wealth.

Panama City (75,000), the capital of the republic, on the Pacific coast, and Colon (57,000), at the Atlantic end of the Panama Canal, are both excluded from the Canal Zone, and are not under the control of the United States.

The future of the republic is closely bound up with the great canal, one of the most important trade links in the world. Columbus and other voyagers had sought a sea-way through the newly discovered lands in order to continue exploration westward. When the Spaniards realized that only a narrow isthmus formed the barrier in Central America projects for cutting a canal through Panam& or Nicaragua were soon discussed. Nothing definite was accomplished, however, until 1881, when a French company, directed by Count Ferdinand de Lesseps, the celebrated engineer who had constructed the Suez Canal (opened in 1869), began work upon a canal across Panama. In 1889, after much work had been done, de Lesseps had to acknowledge defeat, and the project was abandoned.

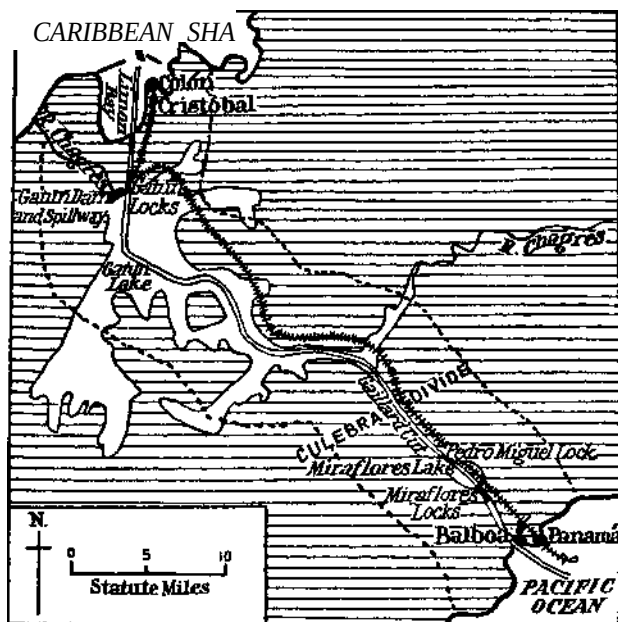
The brief Spanish-American War of 1898 convinced the United States of the vital necessity of establishing closer contact between her Atlantic and Pacific fleets than existed *via* Cape Horn. The first step was to buy out the rights and property of the French company for £8,000,000. Then followed the arrangement with Panama, whereby the United States acquired absolute control over a strip of territory, the Canal Zone, five miles wide on either side of the projected canal route.

The way in which the United States overcame the immense difficulties involved constitutes one of the most romantic stories of modern engineering, and gives some

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indication of the way in which health conditions in other tropical lands might be vastly improved.

The failure of the French attempt was mainly due to the prevalence of malaria and yellow fever, which caused



-Boundary of United States Canal Zone.

Land surface (mostly over 500 ft). Railway.

FIG. 25. THE PANAMA CANAL

Note that the Pacific end of the canal lies east of the Atlantic (Caribbean) end.

very serious losses among the labourers, all of whom were whites. Some years later it was discovered that the fever germs were conveyed by mosquitoes. Armed with this knowledge, the Americans spent two years in improving the sanitary conditions of the Canal Zone. The natives

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were sent out of the region; mosquito-proof houses and hospitals were built; abundant supplies of pure water were provided; swamps and stagnant pools were drained or sprayed with paraffin, which killed off the larvae that would later have developed into mosquitoes. So well did Colonel W. C. Gorgas and his assistants accomplish their task that the zone was cleared of mosquitoes, fleas, and rats (all disease-carriers), and to-day the Canal Zone is considerably more healthy than most parts of the United States.

The French were attempting to construct a sea-level

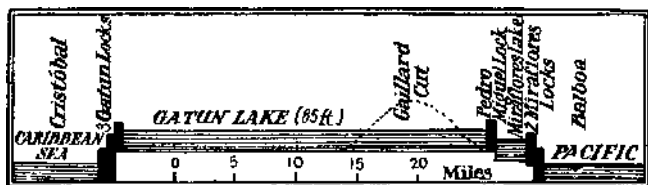


FIG. 26. SECTION ALONG THE PANAMA CANAL

The vertical scale is exaggerated over a hundred times.

canal, but, realizing the almost insuperable tasks involved, the Americans decided upon a high-level, fresh-water canal, reached by stair-locks at either end. The ingenuity and efficiency of the Americans were amazing. The engineering works were in charge of Colonel G. W. Goethals, assisted by white engineers and overseers. Of the 50,000 labourers 80 per cent, were West Indian negroes, men accustomed to the climatic conditions, the remainder being chiefly Spaniards and Italians.

The river Chagres, which crossed the zone from east to west, constituted a serious obstacle, owing to its liability to big floods. The great Gatun Dam was therefore constructed to hold up the waters of the river, thus forming the artificial Gatun Lake, 164 square miles in area and 85 feet above sea-level, as a section of the canal, while the overflow at the Gatun Spillway generates sufficient

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electricity for the lighting and working of the whole canal enterprise.

The site of the canal was determined by two factors: the isthmus is here only thirty-four miles wide, and the mountainous backbone is at its lowest (under 400 feet). The French had already done rather more than half the excavation necessary, and the making of the Gaillard or Culebra Cut, eight miles long and 300 feet wide at the bottom, the greatest work of the kind ever attempted, was completed with the aid of great steam-shovels. The rock and earth removed from the cut were used in the construction of the Gatun Dam and the canal locks. The Gaillard Cut is the weakest part of the canal—constant dredging is necessary to maintain a clear channel, and landslides from the steep sides have occasionally blocked the cut, although traffic has been uninterrupted since January n, 1917.

From shore to shore the Panama Canal measures 42 miles, or 50-1 miles from deep water to deep water. From the Caribbean Sea a vessel crosses Lim on Bay through a buoyed channel, five miles long, cut into the sea-bed. The three Gatun Locks raise the ship eighty-five feet to the level of Gatun Lake, across which it can steam twenty-three miles to the Gaillard Cut. At the end of the cut the ship is lowered thirty feet in the Pedro Miguel Lock to Miraflores Lake, and finally another fifty-five feet in the two Miraflores Locks to the Pacific Ocean level. Each lock-chamber is 1000 feet long, no feet wide, and seventy feet deep, and thus capable of taking the largest vessels afloat. Electric locomotives tow vessels through the locks, which are in pairs to enable one vessel to ascend while another is descending. The complete passage of the canal takes seven or eight hours.

Cristobal,¹ the twin city of Colon, is the Atlantic terminal of the Panama Canal, while Balboa, a short tram-ride from Panama City, is the Pacific port. Both terminal

¹ Spanish for Christopher.

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tains a big element of Spanish blood, lives on the hi
central plateau.

Nine-tenths of the export trade is accounted for by two
products: coffee and bananas. The excellent quality of



FIG. 28. HAULING BANANAS, COSTA RICA

Note the banana plants. Light tramways are used for transporting the
fruit to the railways.

By courtesy of H. Wimmer, Port Limon, and Messrs Elders and Fyffes, Ltd.

the coffee gives it great favour in England, and 50-75 per
cent, of the export goes to London. Bananas are exported
to Bristol, New Orleans, New York, and Boston. The
United Fruit Company of North America is responsible
for the recent expansion of the fruit trade, chiefly in
bananas and pineapples, about 18,000 coloured British

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West Indians being employed on the farms. The export of cacao is also increasing. Minor exports are gold, silver, timber, honey, fruits and vegetables, hides and skins. The United States, Great Britain, and Germany share between them most of the foreign trade of Costa Rica, the United States alone being responsible for much more than one-third of all export and import trade. About 450 miles of efficiently run railways are in operation in Costa Rica, but only about 150 miles of motoring roads are at present open for traffic.

San Jose (68,700), the capital, is a picturesque city built on the plateau at a height of 3800 feet. A railway (103 miles) links the capital with Limon (16,000), on the Caribbean coast. Limon is the chief port of Costa Rica, and the headquarters of the coffee and fruit trade. Puntarenas (8000), on the Gulf of Nicoya, is the chief Pacific port, seventy-three miles by rail from the capital.

NICARAGUA

Nicaragua, a little smaller than England and Wales, is the largest Central American republic. Hot, wet, forested lowlands are extensive, especially on the Atlantic side, where the broad plain of the Mosquito Coast has been built up by alluvium from the rivers. The Mosquito Coast is fringed with coral reefs and islets, bearing coconut-palms, and enclosing many lagoons; mangrove swamps are common. The backbone of the country is a mountain range rising to 7000 feet, and on the Pacific side there is a low coastal range. Between these two ranges there is a remarkable trough, including the Gulf of Fonseca on the north, and the valley of the San Juan river on the south. Numerous volcanoes, many of them active, rise above the volcanic soils of the trough, much of which is occupied by two large lakes, Managua and Nicaragua, the source of the San Juan. Volcanic cones have been built up in Lake Nicaragua, the largest island, Omotepe, being an active volcano with twin craters.

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The population of Nicaragua is about 750,000, and is chiefly of mixed Spanish and Indian blood. The remainder are pure Spaniards, or, on the Mosquito Coast, West Indian negroes and zambos. Three-quarters of the people live in the western half of the country, mainly on the healthy, fertile plateaux and uplands.

The chief product is coffee, of which more than half is exported to the United States. Extensive banana plantations in the eastern parts of the country furnish another important export to the United States. The fruit is carried in barges to steamers lying at cays (low islands) about twelve miles from the coast. Forest products (cabinet woods, dye-woods, rubber, etc.) rank next, mahogany being the most important item. Sugar, gold, hides, silver, and cotton are minor exports. More than half the total trade is with the United States. A National Railway (about 169 miles of single track) links together the western towns, and connects with steamers sailing on Lake Nicaragua and down the San Juan river to Greytown. Road transport is in a primitive state, and pack-mules are employed on rough tracks. A few motor roads are under construction.

Managua¹ (33,000), the capital, stands at the southern end of Lake Managua, in a region producing coffee, cacao, cattle, and sugar. Leon (24,000), lying fifty-two miles north-west of Managua, is the centre of a rich agricultural district. The chief ports are Bluefields (4700) and Greytown (900), on the Caribbean coast; and on the Pacific Corinto (2300), a port handling 65 per cent, of all foreign commerce.

The depression containing the San Juan river and Lake Nicaragua obviously lends itself to the construction of a canal from coast to coast. As long ago as the sixteenth century this route was chosen as a possible alternative to that of Panamd. During the early nineteenth century several projects for a Nicaraguan canal were started, but

¹ Managua was almost destroyed by an earthquake on March 31, 1931-

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failed. In 1916 the United States secured from Nicaragua the right—for ninety-nine years—to construct a canal. The successful operation of the Panama Canal may be followed at some future date by the construction of a canal through Nicaragua, an event that would inevitably increase the importance of the republic.

HONDURAS

Honduras,¹ about one and a half times the size of Ireland, has a long coastline (400 miles) on the Atlantic side, and a short one (60 miles) on the Pacific. Honduras is a mountainous country, well watered, densely forested, rich in minerals, and free from volcanoes and destructive earthquakes. The population of 963,000 is mainly native Indians, with an admixture of Spanish blood.

The chief export is bananas, grown on the Caribbean coast, and sent almost wholly to the United States. Coconuts and coffee are other exports. Silver is the most important mineral; there are also supplies of gold, copper, iron, coal, and petroleum. Large herds of cattle are reared on the upland pastures. Narrow-gauge railways, totalling nearly 900 miles, are employed chiefly in transporting bananas. Road transport is poor, but improving.

Tegucigalpa² (47,000), standing at 3200 feet, in a region important for agriculture and precious metals, is the capital and commercial centre. The chief Pacific port is Amapala (5000), on the great Bay of Fonseca. Puerto Cortez (9600), 207 miles from the capital, is the chief Caribbean port, and has a large export of bananas.

SALVADOR

El Salvador ('The Saviour') is the smallest, but most densely peopled of the Central American republics, and lies entirely on the Pacific side. It is crossed by two volcanic ranges in which there are many fertile valleys.

¹ Honduras means 'shallows,' probably a reference to the shallow waters of the Caribbean coast. ² Meaning 'Silver Hill.'

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Earthquakes and volcanic eruptions are frequent. Temperature naturally varies with height, and abundant rainfall gives rise to numerous streams. The population of about 1,500,000 live mainly on the plateau, and is chiefly of mixed blood, pure natives forming about 10 per cent.

The chief agricultural product is high-grade coffee, the mainstay of the country's commerce. Of many other exports the chief are sugar, henequen * or sisal, indigo,² and Peruvian balsam, a medicinal liquid obtained from a tree. Trade is carried on mainly with the United States, Germany, and Great Britain. Tropical fruits, beans, maize, wheat, rice, and tobacco are grown, mainly for the home market. Gold, silver, copper, lead, zinc, and mercury are obtained from the mountains. A number of small manufacturing industries (soap, candles, leather, cigars, etc.) are carried on, in some cases by hydro-electric power. Transport facilities by rail and road are as good as in any part of Central America, but only small craft can use the rivers.

San Salvador ('Holy Saviour'), with a population of 100,000, is the capital and commercial centre. The city is over 2000 feet above the sea, and is joined to its Pacific port, La Libertad (4000), by twenty-five miles of railway and a good road. San Salvador is well built, prosperous, and healthy. Santa Ana (80,000), San Miguel (42,000), and San Vicente (26,000) are important agricultural centres.

GUATEMALA

Guatemala is the chief commercial country of Central America. Its area is over half that of Great Britain; its population of 2,250,000 is little more than that of Wales.

¹ Henequen (pronounced 'h6n-e-ken') is the fibre obtained from the *ajave* (*fa-ga-ve*), or American aloe, and is commonly known as sisal-hemp. It is used for making ropes and cables.

² Indigo is a blue dye obtained from the stalks of a fibrous plant. A good deal is grown in the Ganges basin, hence the name indigo, from the Latin *indicus* ('Indian'). Vegetable indigo has declined in importance in face of the competition of blue dye made from coal-tar.

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At least 60 per cent, of the people are Indians, the remainder being mestizos, save for a small number of pure Spaniards and other Europeans.

There are two natural regions: (*a*) the hot, wet, forested plains, extensive in the north, where they continue the limestone of Yucatan and reach the Caribbean Sea, and bordering the Pacific in the south; and (*b*) the mountainous centre (nearly two-thirds of the country), a region of earthquakes and volcanic activity, renowned for its natural beauty and pleasant climate. The plateaux and mountain slopes are the most productive areas in the country, and contain most of the people.

Coffee is grown on volcanic soils at 2000-8000 feet, and forms the chief export (about 80 per cent, of all exports), going largely to San Francisco. Germans own more than one-third of the plantations. Bananas from plantations on both Caribbean and Pacific slopes rank second in export trade. Chicle gum, exported through Belize (British Honduras) to North America for the manufacture of chewing-gum, is exceeded in quantity only by the production of Mexico. Sugar and timber are minor exports, while maize, rice, and vegetables are grown for home consumption. About half of both import and export trades is carried on with the United States. Transport facilities are improving. There are several important railways, of three-foot gauge, including one from coast to coast. Small steamers, motor-boats, and canoes are employed on the numerous rivers, and a number of good roads have been made.

Guatemala City (134,000), standing on a broad, beautiful, and healthy plateau nearly 5000 feet above the sea, is the capital and largest city. It is linked by rail with ports on either coast; Puerto Barrios, on the Caribbean coast, has a large, almost land-locked harbour in the Gulf of Honduras, and receives three-quarters of the total import trade; San Jose (1500) is the Pacific port, dealing with exports of coffee, rubber, hides, timber, etc. Guate-

CENTRAL AMERICA

mala City was destroyed by earthquake in 1918, but the opportunity has been seized to construct wide streets and imposing buildings. The chief industries are the making of cigars and cotton cloth and the preparation of coffee for export.

BRITISH HONDURAS

British Honduras, a colony a little bigger than Wales, owes its origin to the settlement of British subjects who crossed over from Jamaica, about 800 miles due east, and brought with them their negro slaves. The value of the land lay mainly in its wealth of logwood and mahogany. There were frequent conflicts with the Spaniards, but after 1798 Spain made no further attempt to conquer the land, which in 1884 became a Crown Colony, quite independent of Jamaica.

Off the coast of British Honduras there are many low coral islets (cays, or keys), on the larger of which there are coconut-palm plantations and the homes of fishermen. In spring or late summer certain islets are used as camping-grounds for holiday-makers, who enjoy good fishing, provided they can avoid the sharks. The coastal plain is hot and swampy, and generally fringed with coconut-palms. Malaria is prevalent. The northern half of the colony is low and flat, but in the south the Cockscomb Range—the significance of the name is clear—rises 3700 feet. Earthquakes are unknown. The soils are very fertile, and, thanks to the north-east trades, well watered by rivers. Rivers are the chief means of transport, the best being the Belize. There is only one good road, and one railway (twenty-five miles long) in the whole colony. Cattle and mules are important as beasts of burden, or for hauling timber. Motor-boats are used along the coast and on the rivers. The population of over 50,000 includes 2600 Europeans. The rest—the labourers—are Creoles,¹

¹ A Creole is, strictly speaking, a native of pure Spanish or French blood born in the country, but the word is sometimes misapplied to half-castes or to West Indian negroes.

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negroes, and native Indians. The interior of the country is little known, but in the south interesting remains of the ancient Mayan civilization (about 3000 B.C.-A.D. 1700) have been discovered among the dense vegetation, the finest being a vast amphitheatre, like the Roman Colosseum, capable of seating 10,000 people.

Splendid forests cover over two-thirds of British Honduras. Mahogany, the finest in the world, is a valuable export, chiefly to the United States. The great supplies existing are being increased by the planting of trees in selected areas. Logwood forests occur on damper soils in the north and south. The heart wood is removed, and exported as a dyeing material. Other valuable trees are cedar, rosewood, walnut, and iron wood, sapodilla (the source of chicle), and mangroves (yielding tanning material).

Of agricultural products the chief are coconuts, exported fresh or as copra—*i.e.*, coconut kernels cut up, and dried in the sun; fruits (banana, lemon, orange, lime, grapefruit); sugar, rice, and maize, for home consumption. Tortoiseshell and lobsters are the chief exports of marine produce.

British Honduras has only one town of any size—Belize¹ (17,000), which is the capital and chief port. Belize stands at the mouth of the river Belize, and is about 4700 miles from London. The harbour is entered by a narrow, winding channel between sheltering reefs, but vessels, according to their size, must anchor one to four miles from the coast, cargoes being carried in lighters. Belize is the outlet not only for the produce of the colony, but also for the neighbouring parts of Mexico and Guatemala. Belize is an overnight stopping-place on the Pan-American weekly air mail and passenger service between Miami (Florida) and Cristobal (Panama Canal Zone).

¹ Belize is probably a Spanish corruption of 'Wallace,' the name of a British buccaneer. The town was almost destroyed by a violent hurricane and tidal wave on September 10, 1931.

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EXERCISES

i. In 1936 2612 vessels, with cargo tonnage of 18,256,044, passed through the Panama Canal from Pacific to Atlantic, while 2770 vessels, with cargo tonnage of 8,249,899, passed from Atlantic to Pacific. Can you suggest any reason for this big difference in tonnage? What kind of goods would be carried?

2. Compare the Panama Canal with that of Suez, with special reference to their effects upon trade-routes and the development of countries near those routes.

3. On a large outline map of the Central American countries indicate the chief towns, routes, and products.

4. Briefly contrast the Pacific and Caribbean coasts of Central America, with particular reference to climate and human activities.

CHAPTER VI

THE WEST INDIES

THE West Indies are the higher portions of a partially submerged continent. The earth movements that produced the Gulf of Mexico and the Caribbean Sea, with its deep depressions, also broke up the remaining land into scattered islands. Earthquakes and volcanoes give evidence of these crustal movements. In Haiti¹ there are three west-east mountain ranges, of which the central one is continued in Southern Cuba as the Sierra Maestra, and the southern in Jamaica as the Blue Mountains. The three ranges of Haiti converge eastward to form the mountain mass of Puerto Rico. The four islands—Cuba, Haiti, Jamaica, and Puerto Rico—are known as the Greater Antilles. The name Lesser Antilles is given to the small islands—peaks of a submerged ridge—sweeping south from Puerto Rico to link up with the structure of Northern Venezuela. In the Lesser Antilles there are two chains of islands. The inner, or western, chain is volcanic, and consists of mountainous islands of wonderful fertility. The chief are St Kitts (or St Christopher's), Montserrat, the western part of Guadeloupe, Dominica, Martinique, St Lucia, St Vincent, and Grenada. The outer, or eastern, chain is composed of limestones, including coral, usually low and flat, and therefore easily cultivated. The chief islands are Barbuda, Antigua, Eastern Guadeloupe, Barbados, Tobago, and Trinidad. The Bahamas, lying round the tropic of Cancer, are another coral group, resting on a submarine continuation of Florida. The Panama Canal has increased the importance of certain channels in the

¹ Called Hispaniola ('Little Spain') by Columbus.

THE WEST INDIES

West Indies: Florida Channel, Windward Passage, Mona Passage, and Yucatan Channel.

The West Indies have a tropical climate, with low range of temperature. The north-east trades are the prevailing winds, and the mountainous regions receive some rainfall at all seasons. Most rain comes in summer, when thunderstorms are frequent. Leeward slopes are much drier than the windward slopes. Hurricanes in late summer may do

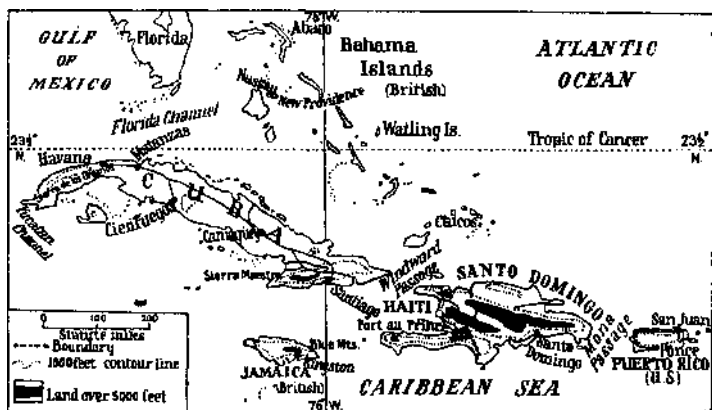


FIG. 29. THE GREATER ANTILLES

The railways of Cuba, Haiti, and Puerto Rico are marked.
Those of Jamaica are shown in Fig. 30.

immense damage. The Lesser Antilles have long been divided into the Leeward Islands and the Windward Islands, but the names have no true significance.

The original inhabitants of the West Indies were the Arawaks, a backward race, and the Caribs—fierce, warlike man-eaters. Indeed, our word 'cannibal' is a corruption of Xaribal,' a variation of Xarib.' The Spaniards killed off the Arawaks, and almost annihilated the Caribs. Then, to solve the problem of labour supplies, large numbers of African slaves were introduced, and their descendants form a big proportion of the present population. The

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abolition of slavery led to a serious decline in prosperity, aggravated by the competition of beet-sugar grown in Europe, for sugar-cane had always been the staple crop of the West Indies. As some negroes do not like plantation work, many Indian and Chinese coolies have been introduced, adding still further to the mixture of races. The West Indies have had a complex history. Originally Spanish, not a single island now belongs to Spain. Most of the islands are either possessed by, or under the control of, the United States or Great Britain. France and Holland own a few small islands.

CUBA

Cuba, one and a half times the size of Scotland, is the largest and by far the most important of the West Indies. Its position gives it great strategic importance, which explains the interest of the United States in its welfare. The Spanish-American War of 1898 came about chiefly through disputes concerning Spanish rule, and the desire of Cuba for independence. Cuba is now an independent republic, under the benevolent care of the United States, which have been granted a powerful naval station at either end of Cuba.

In the east of Cuba the picturesque Sierra Maestra rises to 8000 feet. In the west is the Sierra de los Organos. Between the two highland groups there are plains and low hills of limestone, in which there are many caverns and hollows. The coasts are rocky, and furnish many fine harbours. The climate is equable and wet, supporting a great wealth of trees—palms, cedar, mahogany, logwood, etc.—and other plants. Under United States influence drainage, water-supply, and general sanitary conditions have so greatly improved that Cuba is one of the healthiest lands in the world, and one of the favourite winter resorts of Americans. The population is over 4,000,000, of which nearly 70 per cent, are white,

THE WEST INDIES

Spain under a treaty of 1697. The French developed the natural resources of the country, and made it the most prosperous West Indian colony, until the First French Republic, following the Revolution of 1789, issued a decree granting freedom to the slaves of Haiti. Shortly afterwards Napoleon rescinded this decree, and instituted slavery once more. Thereupon the negroes rebelled, massacred the French people in Haiti, and (in 1804) set up a negro republic from which whites were excluded. For ninety years Haiti was left to govern itself, and its history has been one of appalling degradation. Poverty, disease, cruelty, rebellion, and oppression brought the country to a state of ruin. The United States had long desired to intervene, and their opportunity came in 1915, when 200 prominent Haitians—including the President—were murdered by an infuriated mob. The French-speaking independent republic of Haiti was, therefore, governed with the assistance of the United States, under a treaty which expired in 1936.

The Americans have done much for Haiti. They have cleared and laid out streets. They have made roads. They have built fine buildings. They have established hospitals. They have established order. They have wiped out the brigand forces. . . . And all this has been done with the surplus from the Haitian revenue, with the money that was before squandered in bribery. Haiti has become one of the most pleasant tropical places in the world. No island could be lovelier. . . . There is the haphazard South Sea atmosphere of a simple, unexploited peasantry living on its own land, working just so much as it needs to support life; where there is no need to work hard if your needs are simple. They are a happy and sweet-natured people. . . . There is also the French atmosphere; a Parisian atmosphere of *cafes*, and elegance, and well-dressed women. There is more grace of living, more culture in Port au Prince than anywhere else in the Antilles. . . . Thirdly, there is America: the America of efficiency, and wide streets, and motor-cars.¹

¹ *The Coloured Countries*, by Alec Waugh (1929).

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The Haitian population of 3,000,000 is predominantly negro. The country is devoted to agriculture, the peasants cultivating their own small farms. Coffee of excellent quality is the chief export. Other exports are raw cotton, logwood, cacao, tobacco, sugar, and sisal. France takes nearly half the exports, while the United States supply half the imports. Port au Prince (115,000), the capital, stands on a splendid harbour.

THE DOMINICAN REPUBLIC

The eastern two-thirds of Hispaniola is the Spanish-speaking republic of Santo Domingo, founded in 1844. From 1916 to 1924, when a new constitution was adopted, the country was occupied by American Marines. The population of 1,478,000 is of mixed blood—negro, Spanish, and Indian. The capital and chief port, Ciudad Trujillo¹ (71,000), is the oldest Spanish city in America, founded in 1496 by the brother of Columbus. Destroyed by a hurricane in 1502, the city was rebuilt on the other side of the river Ozama, but was once more destroyed, save for a few historic buildings, by another hurricane on September 3, 1930. Agriculture is the chief industry of the country, sugar (most important), cacao, tobacco, and coffee being exported. The United States provide over half the imports (cotton goods, rice, machinery, etc.), while Britain takes nearly half the exports.

PUERTO RICO

Puerto Rico is the smallest of the Greater Antilles, and the most densely peopled. Unlike the other West Indian islands, Puerto Rico has a large and increasing white population of 1,325,000, while the coloured people (under 400,000) are decreasing in numbers. As a Spanish colony the island was a convict station until early in the nineteenth century. After the Spanish-American War Puerto

¹ Known as Santo Domingo until 1936.

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goods, flour, fish, petrol, motor-cars, boots and shoes, timber, hardware, and coal. The bulk of both import and export trade is carried on with Britain, but United States trade is also very important. Special American steamers, equipped with cold storage, are employed in the fruit trade.

•Kingston (63,000), the capital, has a fine deep-water harbour on the sheltered south-east coast, and exports sugar, rum, and fruit. The harbour is used by twenty steamship lines. Kingston was almost destroyed by an earthquake in 1907. Port Antonio (6000), on the north-east coast, is the chief fruit port. Other towns of note are Spanish Town (8000), the old capital, and Port Royal, a naval station.

Along with the Crown Colony of Jamaica are governed certain small islands: the Cayman Islands, noted for turtles, guano, and coconuts, to the west; and the Turks and Caicos Islands—the most southerly of the Bahamas—to the north-east. The Turks and Caicos Islands export salt (obtained by evaporation of sea-water), sponges, and dried fish.

The Bahama Islands. The Crown Colony of the Bahama Islands consists of about 3000 low coral islands, islets, and rocks. Their wind-blown coral sands rise very little above sea-level, and salt lagoons are common. Only twenty islands are inhabited, the total population being 65,000, chiefly blacks or other coloured peoples, and all speaking English. The most important islands are New Providence—the most populous—and Abaco, the largest. The chief occupations are the growing of fruits (tomatoes, pineapples, oranges), early vegetables for the United States markets, and the agave, from which sisal hemp is obtained. Sponges (the most valuable export), turtle-shell, coral, and pearls are obtained from the sea, and salt is raked from hollows into which sea-water flows and evaporates. Trade is carried on mainly with the United States, Britain, and Canada.

THE WEST INDIES

Blue Mountains, rising to 7000 feet, form an east and west axis from which numerous unnavigable streams tumble with falls and cataracts to the coastal plains. A good deal of Jamaica is a limestone plateau. The prolific plant life includes palms, cabinet-woods, dye-woods, spices, and tropical fruits. Good roadways (over 2400 miles) enable one to explore all parts by motor-car. There are 210 miles of railway, 129 miles of steam tramways, sixty-nine of mule tramways, and eighteen of electric tramways.

Jamaica occupies a favourable position on the Panama Canal routes. The island is devoted to tropical agriculture, but is not so prosperous as Puerto Rico. Sugar (and rum made from sugar), pimento¹ (most of the world's supply), coffee, coconuts and copra, logwood, cacao, and ginger are exported.

By far the most important export, however, is banana[^] grown and exported almost wholly by the United Fruit Company of T> The leading imports are cotton



FIG. 32. CASSAVA ROOTS, JAMAICA

The swollen, fleshy roots contain a nourishing starchy food, which we obtain in the form of tapioca. ("assavi" is also known as mandioca or manioc).

By courtesy of the West India Committee

¹ Pimento^{*}
known
mon

Jamaican tree. It is commonly
combine the flavours of china-

THE V?

Nassau (15,000), on New Providence, is the capital. With its white roads and houses, set amid luxuriant vegetation in the brilliance of tropic sky and sea, Nassau is strikingly beautiful, and attracts many visitors from Florida, especially in winter.

Bermuda. "The still-vex'd Bermoothes,"* as Shakespeare calls the Bermudas in his romantic play *The*



FIG. 33. THE SPONGE INDUSTRY, NASSAU, BAHAMA ISLANDS.

The sponge is the skeleton of a marine animal whose jelly-like body is washed out before the sponge is dried for export. Sponges grow on the bottom of warm, shallow waters.

By courtesy of the West India Committee

Tempest, may conveniently be studied at this point, since, Wee the Bahamas, they are a group of coral islands, 360 number (about twenty inhabited), ail close together and standing upon an isolated bank that rises abruptb from the Atlantic bed. They are remarkable as being tb

JM The group was called after its Spanish discoverer, Juan de B mudéz—pronounced 'Bermoothes.'

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most northerly coral formations in the world, thanks to the warm waters of the ocean currents—including the

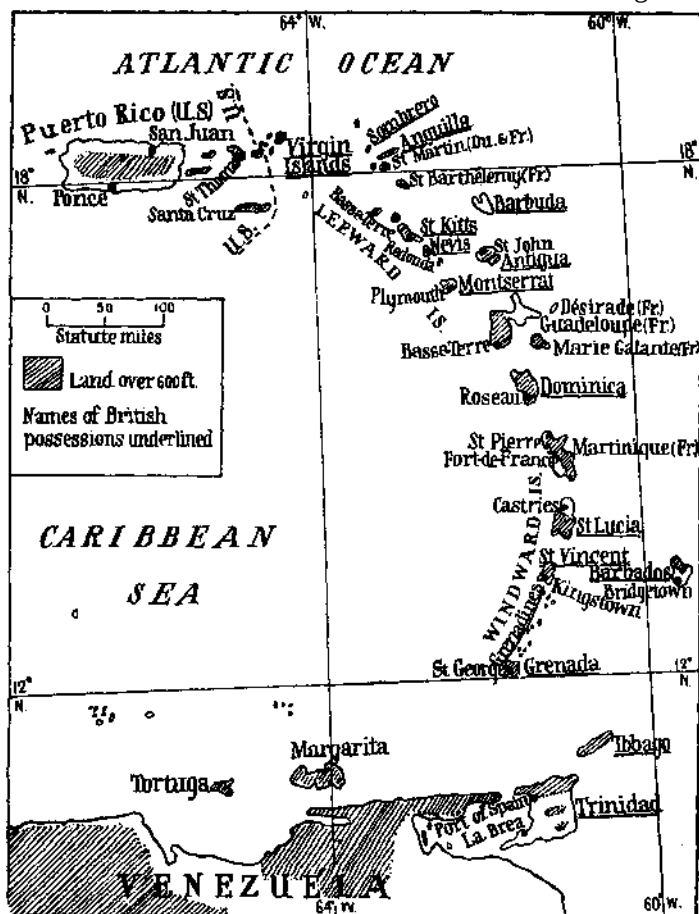


FIG. 34. THE LESSER ANTILLES

ulf Stream—and the tempering winds of the Atlantic. The coral reefs are most developed on the north and west, where they form a sheltering barrier, through the intricate

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channels of which vessels make their way to the main islands. The climate is remarkably mild and equable. Frost is unknown, and the mean temperature for the coldest month (February) is about that of the hottest month (July) in South-east England—*i.e.*, 62° or 63° F. The islands have a combined area of only 19.3 square miles, and their population of 30,000—of whom 11,900 are white—is doubled in winter by many holiday-makers and invalids, chiefly from America, attracted by the climate, the scenery, and the opportunity for sports.

Soils are rather poor, but the favourable climate, added to the proximity of North America, has led to a flourishing trade in early potatoes, onions, fruits, bulbs, and flowers for the New York market, 677 miles away. The position of Bermuda on great ocean routes has led to the establishment of a fortified naval base. The capital, Hamilton (3000), has good roads, but space is so restricted that motor-cars are prohibited, and the highways are thronged with bicycles and horse-drawn vehicles.

The British Leeward Islands. This federated colony includes thirty of the thirty-four Virgin Islands, also Sombrero, Anguilla, St Kitts (with Nevis), Antigua (with its dependencies of Barbuda and Redonda), Montserrat, and Dominica, with a total population of 138,000.

The Virgin Islands produce sugar, tobacco, cattle, cotton, and fish. Sombrero has deposits of phosphate of lime—a valuable fertilizer. Anguilla ('Eel'—a reference to its shape) also exports phosphates and salt.

St Kitts consists of a single extinct volcano, Mount Misery, 3700 feet high. The weathered lava soils of its gentle slopes are very fertile. The chief products are sugar, molasses, rum, cotton, salt, and arrowroot.¹ Basse-Terre, on the western side, is the chief town. Nevis is a similar volcanic island, producing sugar, coconuts, and salt.

¹ Arrowroot is a starchy food obtained from the roots of certain West Indian plants. It is commonly used as an article of diet (in the form of cakes, biscuits, puddings, etc.) for children and invalids.

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Antigua, the governing centre of the Leeward Islands, is a beautiful hilly island, rising to 1500 feet, with high, indented coasts, but shallow harbours. Sugar, cotton, and pineapples are grown. St John (9000) is the chief town. Barbuda and Redonda export phosphates and salt.

Montserrat (as its name implies) is so mountainous—rising to 3000 feet—that only one-third of the island can be cultivated. Cotton, sugar, tomatoes, onions, and lime-juice are exported. Plymouth (1800) is the chief town and port.

Dominica is another mountainous island, rising to 5300 feet, and including an active volcano. Many torrential streams descend to the bold, rocky coasts. There are no harbours, and vessels anchor off the leeward coast. Lime-juice, coconuts, cacao, and sugar are exported. Chariottetown, or Roseau (8500), is the capital.

The British Windward Islands. The federation of the Windward Islands includes St Lucia, St Vincent, the Grenadines, and Grenada. St Lucia is a beautiful, well-wooded, volcanic island, with fertile soils supporting good crops of sugar, cacao, fruits, and spices. Castries, the capital, has the finest harbour in the West Indies, and so has become a naval station and coaling-port, and the headquarters of British soldiers.

St Vincent has an active volcano, La Soufriere, which did immense damage to the plantations in 1812, and again in 1902. Arrowroot, sugar, rum, cotton, cacao, and spices are exported from Kingstown (4000), the capital, situated on a big harbour.

The Grenadines are unimportant, but Grenada, a slightly larger volcanic island than St Vincent, has exports of cacao, nutmegs, mace, cotton, fruits, and vegetables. St George's, the capital, has a good harbour, and is the residence of the Governor of the Windward Islands.

Barbados. Barbados, the most easterly of the West Indies, is a little larger than the Isle of Wight. The population of 182,000 is predominantly black, intensely

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patriotic, and proud of its British citizenship. Barbados is composed of sandstone and limestone, rising to 1145 feet, and surrounded by coral reefs. There are many springs, but no rivers. The whole island is under cultivation, the chief exports being sugar and molasses. Bridgetown (13,000), the capital, stands on an open roadstead.

Trinidad. Trinidad continues in the north and south the coastal mountains of Venezuela, and is about the size of Lancashire. Discovered in 1498 by Columbus, Trinidad was first colonized in 1577, and has been British since 1797. The hot, damp climate and remarkably fertile soils support valuable forests, and produce heavy crops of coconuts, coffee, bananas, oranges, tobacco, and rubber. The chief cultivated products, sugar and cacao, form two of the leading exports. Natural asphalt has been dug out of a large pitch lake in the south-west for centuries—the old buccaneers used it in caulking * their vessels. Thousands of tons are exported annually to the United States and Great Britain, mainly for road-paving purposes, but fresh supplies continually well up from below and keep the lake full. Trinidad has also an important oil-field, with wells and refineries. In 1935 over 408,000,000 gallons of crude oil were extracted.

Of the population (413,000) the majority are of African negro descent; most of the remainder are natives of British India, and the few whites are British, French, Spanish, and Portuguese.

Port of Spain (75,000), the capital and chief port, has a fine sheltered harbour on the north-west of Trinidad. Railways run inland to the plantations, and south to the asphalt and petroleum region.

Tobago, a small volcanic island about twenty miles north-east of Trinidad, with which it is governed, exports tobacco, cacao, coconuts, and sugar.

¹ *I.e.*, packing untwisted rope (oakum) into the seams of a ship to make it watertight.

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THE FRENCH WEST INDIES

In the seventeenth century France possessed the greater part of the Lesser Antilles. To-day she has only Guadeloupe, Martinique, Marie Galante, Desirade, St Barthelemy, and a part-share (with Holland) of St Martin. Only Guadeloupe and Martinique are at all important.

Guadeloupe is really two islands, separated by a narrow and shallow channel. The western part—Grande-Terre—is volcanic and mountainous; the eastern part—Basse-Terre—is a flat coral island. In the eighteenth century Guadeloupe was very prosperous, with exports of sugar, rum, and cotton exceeding in value the exports (furs) of Canada at that time. Indeed, for a long time Great Britain disputed with France the possession of Guadeloupe and would have preferred it to Canada in 1763, at the close of the Seven Years War.

Martinique is another volcanic island, on which stands Mont Pelee, a volcano which destroyed the town of St Pierre, with its 32,000 inhabitants, by pouring out dense clouds of intensely hot ash and gases on May 8, 1902.

The competition of beet-sugar has brought prices so low that the cane-sugar industry of the West Indies has lost much of its old prosperity. Guadeloupe and Martinique, in common with other islands, have tried to build up a flourishing trade by adding other crops, such as bananas, pineapples, cacao, coffee, cotton, and tobacco. Both islands are densely peopled with negroes and mulattoes. Fort-de-France (43,000), the capital of Martinique, is the chief French naval base in the West Indies. The capital of Guadeloupe is Basse-Terre (9300), but Point-a-Pitre (30,000), standing on an excellent harbour in Grande-Terre, is the chief port.

THE DUTCH WEST INDIES

The Dutch own a few islands, of which Curaçao (almost as big as the Isle of Man) is the chief. Curafao lies forty

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miles off the Venezuelan coast. Once the headquarters of smugglers, it now produces salt, sugar, tobacco, and oranges of a special kind used in flavouring the famous Curasao liqueur. Willemstad (27,000), the capital of all the Dutch West Indies, has a fine harbour. It has increased in importance owing to the development of the Venezuelan oil-field, and supplies ocean-going vessels with fuel-oil and coal, besides being a port for the transshipment of passengers and cargo to and from Maracaibo. Bonaire and Aruba are two islands near Curasao. Five hundred miles north-east lie the rest of the Dutch West Indies: Saba, St Eustatius, and the southern half of St Martin.

EXERCISES

1. Give an account of West Indian trade in (a) sugar, (b) fruits, (c) coffee, (d) tobacco.
2. Compare Puerto Rico and Jamaica in position, economic development, and trade. Take careful note of their population and trade statistics. (See Appendix, page 357.)
3. Compile, in appropriately headed columns, a brief statement of the principal geographical facts connected with (a) the British, (b) the French Lesser Antilles.
4. Compare the West Indies with the East Indies in position, climate, development, and importance in world trade.
5. Draw a sketch-map to show the position of Havana and Kingston (Jamaica) with reference to important trade routes.

CHAPTER VII

MEXICO

Los Estados Unidos Mexicanos—'The United Mexican States'—have an area of over 767,000 square miles, or more than six times that of the British Isles. The turbulence of Mexican history partly explains the relatively backward condition of a country with great possibilities for development. Such turbulence, however, is a sign of the impatience of the Mexicans for progress and general improvement of conditions. In fact, the history of Western civilization does not record any other case of a people having passed in four centuries from human sacrifices to co-operative enterprise, scientific development, and all forms of modern social activity. First conquered by Hernando Cortes in 1519-21, Mexico was for three centuries part of the Spanish Empire, finally becoming an independent republic in 1821. Since then Mexico has lost extensive territories to the United States. Frequent revolutions have done much to hinder material progress, although the country enjoyed a long period of calm under the presidency of General Porfirio Diaz, 1876-ign. On the other hand, revolutions have hastened the social and spiritual development of the people in general, and have brought about a very considerable cohesion among the Mexican peoples, thus creating the Mexican nation of to-day. The bitter dispute between Church and State, which reached a climax in the religious differences of 1926, was amicably settled in 1929.

The population of Mexico is over 16,500,000. About 55 per cent, are of mixed blood, 30 per cent, native Indians, and 15 per cent, pure whites—mainly of Spanish origin.



FIG. 35. MEXICO: ITS RELIEF, RAILWAYS, AND TOWNS

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The native Indians are with few exceptions hard-working, sober, and law-abiding. Their wants are few and early satisfied. They have a passionate love of their native soil. Big obstacles to progress are lack of a uniform language—a hundred dialects are in use—and the illiteracy of a great mass of the people, many of whom can neither read nor write. Free and compulsory education, however, is overcoming these difficulties,¹ and the revolutions themselves have been a great means to social progress and racial, linguistic, and spiritual unity.

Mexico is almost bisected by the Tropic of Cancer, and has both Pacific and Atlantic coasts. The 800-mile-long peninsula of Lower California and the Gulf of California are southern continuations of the Sierra Nevada and the Californian Valley of the United States. The Mexican coasts are low and flat, and harbours are few.

Mexico north of the isthmus of Tehuantepec consists of a triangular plateau with high flanking ranges, the Western Sierra Madre, and the Eastern Sierra Madre. These ranges are really the scarps of the plateau, which has an average height of 7000-8000 feet. The Gulf Plains of the United States are continued in Mexico, and from their sandy, lagoon-fringed shores there is a gradual ascent by terraced platforms to the Eastern Sierra Madre (about 6000 feet), and to the plateau beyond. The Western Sierra Madre rises to 10,000 or 12,000 feet, and falls steeply to the Pacific coast. The plateau itself consists of a series of ranges and troughs that have been almost completely covered and filled in with volcanic materials, and to a less degree with alluvial soils brought down by mountain streams. Along the southern edge of the plateau there is a chain of lofty volcanoes—mostly extinct—forming the highest peaks of Mexico. The most famous are the beautiful snow-capped Orizaba (18,250 feet), Popocatepetl—'Smoking Mountain'—17,780 feet high, and Colima (12,990 feet). Of these only the Popocatepetl and Colima

¹ There are now nearly 20,000 schools and eight universities in Mexico.

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are active. Earthquakes are frequent, especially on the Pacific side, towards the south of the Republic. Beyond the depression of Tehuantepec, which is important as the only easy route from coast to coast, there projects north the peninsula of Yucatan. This is a limestone plain, honeycombed with sink-holes and caverns, dissolved or worn out by underground streams. These streams and sink-holes supply to-day most of the water consumed in the countryside of Yucatan, just as they did in the times of the highly civilized Mayas of ancient days.

Mexico lies in the trade-wind belt, so that the eastern side is wetter than the western. The coastal lowlands are oppressively hot during most of the year, but the plateau has a mild, temperate climate, devoid of extremes. The air is dry, invigorating, and healthy. Summer is the wet season, when torrential rains are common almost every afternoon. In winter the rainfall is scanty, although at times *nortes*—i.e., northerly winds—bring cold conditions and fine rain. The light or scanty rainfall of the plateau and the great evaporation result in a deficiency of permanent streams. There are many deep troughs—cut out by the raging torrents of summer—that are quite dry in winter. The streams descending from the flanks of the plateau to the sea are too rapid and variable in volume to be navigable—a grave disadvantage to transport. The only river of any size is the Rio Grande del Norte, which forms part of the boundary with the United States, but even this river is often almost dried up, largely owing to the use of its water for irrigation in the state of New Mexico. The plateau at one time contained several big lakes, but these have steadily dwindled away by evaporation. Mexico City at the time of the Spanish conquest stood upon islands in Lake Texcoco. This lake, into which the sewage of the city was discharged, slowly dried up, with disastrous effects on the health of the city, which became one of the most unhealthy in the world. This state of affairs was remedied in 1898, when a canal, forty-

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three miles long, and a tunnel, of over six miles in length, were completed to carry the drainage into a permanent river. Health conditions to-day are highly satisfactory.

Climatic differences in Mexico are due to height rather than latitude. As in Central America, there are three zones: (a) *Tierra Caliente* (up to 3000 feet), hot, wet, and forested; (b) *Tierra Templada* (3000-6000 feet), with a greater rainfall than the *Tierra Caliente*, supporting forests of bamboos, evergreen oaks, magnolia, and myrtle, and crops of maize, coffee, cotton, and tobacco; (c) *Tierra Fria* (above 6000 feet), with a temperate rather than cold climate. The *Tierra Fria* includes most of the plateau, where frost and snow are rare, except on the high mountains. Forests of coniferous trees—pine, spruce, etc.—are found, although on the plateau much of the land has only sufficient rainfall for sage-brush, bunch-grasses, thorny cacti, agaves, and acacias. In the north the scanty rainfall results in semi-desert conditions. Towards the south the increasing rainfall is reflected in the greater number and variety of plants. The pastures support herds of cattle, and crops of maize, wheat, potatoes, beans, and temperate fruits are grown, irrigation being necessary in many areas.

The porous limestone of Yucatan supports a mixture of savanna and jungle, with forests on the higher regions.

NATURAL RESOURCES AND INDUSTRIES

From the earliest times Mexico has been in the main an agricultural country. Deficiency of rainfall on much of the plateau and in other parts of the country makes irrigation essential, the water being supplied by the rains and melted snows of the higher mountain ranges. Irrigation works are under the control of the Mexican Government. Great storage reservoirs have been constructed, from which canals carry the water to extensive areas. The rich volcanic soils of the plateau yield heavy crops if sufficient

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water is available, and several new irrigation schemes are in hand.¹ In accordance with the constitution of 1917 the nation is originally the owner of all lands and waters, minerals and mineral oils, having the right to transmit title thereof to private persons, thereby constituting private property.

Maize has always been one of the chief foods of the people, and the *tortilla*²—a round, flat cake of maize flour—is the favourite food in all parts of Mexico. The chief maize-producing states lie in the southern half of the country. The yield of maize is about 2,000,000 tons per annum, but it is still necessary to import some from the United States. Of other cereals grown in Mexico wheat is the chief, although the value is far below that of maize. Wheat is grown mainly in Northern and Central Mexico, but the crop is variable, owing to uncertain rainfall and lack of irrigation, and the country fails to supply its own needs. The rice production of the plains is also insufficient. Beans, grown in huge quantities, form, with tortillas, the staple diet of most people. Tomatoes and fresh vegetables are produced in increasing quantities, the surplus going to the United States. Temperate fruits (apples, plums, grapes, strawberries) and tropical fruits (bananas, grapefruit, pineapples, coconuts, oranges) are grown. The export trade is small, but capable of great expansion.

Coffee of the finest quality is grown on the mountain slopes, and where cheap labour is abundant the industry is flourishing, with a considerable export trade. Tobacco is grown in the east and south, mainly for home consumption, and for manufacture in about 140 cigar and cigarette factories. Much of the Tierra Caliente is suitable for sugar, of which there is usually a surplus for export. There are many large modern sugar factories, but the old methods of cultivation and manufacture are still used by small

¹ In March 1932 six irrigation systems were in operation, two others under construction, and thirty more under consideration.
² *tortilla* (Spanish) = 'small tart.'

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fanners in various sections of the country. The produce of this small industry is mainly limited to black, unrefined sugar (called *piloncillo*).

Cotton is a valuable crop, dependent on irrigation in the northern states, where conditions resemble those of Texas, the greatest cotton-growing state in the United States. Most of the cotton is manufactured in Mexican mills; surplus raw cotton is exported. The henequen plantations of the Yucatan peninsula, almost wholly Mexican-owned, produce half the world's supply. Other vegetable products of some importance are chicle gum, dye-woods, cabinet-woods, vanilla, and alfalfa.

The agricultural resources have only been developed on a comparatively small scale. The Indian *peons* are generally wretchedly poor; methods of cultivation are on the whole primitive; pack-horses, mules, and donkeys are the only means of transport over considerable areas. In recent years many of the old big estates, or *haciendas*, have been divided up into small-holdings for peasant families, but the latter, still lacking credit facilities, are forced to grow merely sufficient for their own needs. A great proportion of Mexico consists of pasture-lands, and the animal wealth is great. Cattle and horses are reared on the better pastures, where more water is available, while sheep and goats are kept on the drier lands. The revolutions of 1910-20 led to a serious decline in animal stock, but numbers are again increasing. There are some 10,000,000 cattle, 6,500,000 goats, over 3,600,000 sheep, nearly 3,700,000 pigs, and over 1,800,000 horses. Goat's milk is an important food among the poorer classes in remote districts. Meat, hides, and wool are exported.

From the standpoint of export values the most important Mexican industry is mining. From the mountainous parts of the country, including the plateau, great quantities of valuable metals are obtained, the mining being largely in the hands of big foreign companies, which possess sufficient capital for large-scale operations, and

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work with maximum efficiency and economy. About 97 per cent, of the mining properties are foreign-owned (chiefly United States and British).

The output of silver amounts to about 40 per cent, of the world's production. The principal mines lie north of Mexico City. Copper production is increasing, Mexican output ranking third after that of the United States and Chile, while only the United States have a greater production of lead. Gold, zinc, mercury, antimony, graphite, and arsenic are also mined in Mexico. About 1,000,000 tons of coal per annum are mined in the north, for use on the railways and in smelting-works.

The petroleum of the oil-fields on the eastern plains represents the greatest mineral wealth of Mexico. Operations are almost wholly in the hands of British and United States companies, and most of the oil is exported. Pipelines and barges convey the oil to the coast, where it is loaded on to tank-steamships for transport to all parts of the world. In 1921 the output of oil rose to its greatest total of 193,750,000 barrels. Since then legal disputes and other causes have led to a decline to about 40,000,000 barrels in recent years. Mexico ranks seventh as a producer, with an output of under 3 per cent, of the world's total, and has the two largest petroleum refineries in the world.

The manufacturing industries of Mexico are still in their infancy. The chief industries are connected with food and drink (including brewing and sugar-refining) and cotton goods. Other important manufactures are metal goods (hardware, pins, etc.), chemicals, cigarettes, and cigars. Woollen goods, earthenware, and glass are also made. In the past industrial development has been handicapped by lack of capital, poor communications, shortage of coal, and—above all, perhaps—the insecurity of the Mexican Government. Given settled conditions, which are now being securely established, the future is extremely bright. The mountainous nature of Mexico is favourable to the development of hydro-electric power. Many important

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installations already exist, chiefly in the region round Mexico City, and the advantages of erecting others are now being considered.

The rivers are of little use for navigation, and there are few good roads. The chief means of communication are the National Railways. The mountainous nature of the country has made railway construction difficult, but the system has been rapidly extended, and the mileage now exceeds 18,300. Five railways cross the United States frontier to give connexion with Mexico City. The chief two are those through El Paso and Laredo. The capital is also linked with the coast by several lines: to Tampico (600 miles), Vera Cruz (263 miles), and Manzanillo (381 miles). Another railway follows the Pacific coast from the United States southward to about half-way along the western side of Mexico. The only direct inter-oceanic line is that across the isthmus of Tehuantepec, from Puerto Mexico to Salina Cruz, measuring less than 200 miles—the shortest transcontinental line in North America.

Mexico City (1,029,000), standing on the plateau at 7400 feet above the sea, is the capital and commercial centre, built on the site of the ancient Aztec capital. The modern section of the city is well laid out, and has fine buildings. The old city has many colonial palaces and magnificent churches. There are many foreign residents, chiefly engaged in industry and commerce. The climate is healthy and pleasant, and many recreations are available—golf, tennis, bull-fighting, theatres, football, baseball. The surrounding country is very beautiful. Mexico City is the greatest collecting centre, and its manufactures include work in precious metals, cigars and cigarettes, paper, saddlery, hats, pottery, and fancy goods. Not far away lie the remains of an ancient city, with two great pyramids, three temples, and some subterranean buildings.

Guadalajara (185,000), capital of the state of Jalisco, ranks next to Mexico City in size and importance. It is a splendid city, resembling the towns of Southern Spain,

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and situated in a district rich in agricultural products and minerals. There are breweries, textile and flour mills, iron foundries, and pottery and confectionery works.

Puebla (123,000) is another fine city, seventy miles south-east of Mexico City, in a very productive region-

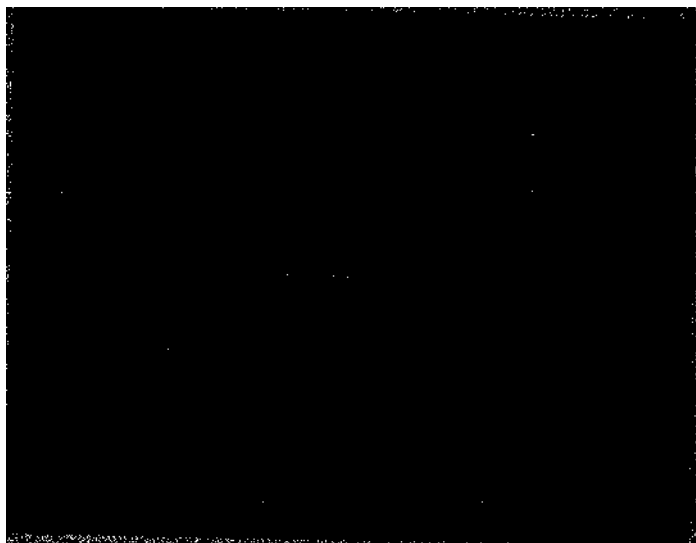


FIG. 36. THE HEART OF MEXICO CITY

The fine old cathedral in the centre is in striking contrast with the modern buildings and thoroughfares.

Fair child Aerial photograph, by courtesy of Wide World Photos

Cotton goods, pottery, paper, hats, and leather are manufactured.

Most of the other large towns lie north of Mexico City in the southern part of the plateau, a fertile region rich in minerals. The chief towns are the silver-mining centres of Guanajuato (31,000), San Luis Potosi (92,000), and Pachuca (47,000); and Aguascalientes—'Hot Springs'—with a population of 82,000, and Leon (99,000), both important industrial centres, with manufactures of textiles,

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pottery, tobacco, leather, and beer. The chief city of Northern Mexico is Chihuahua (62,000), capital of Chihuahua State. It is the centre of a rich silver-mining district, which has one of the biggest and most modern smelting plants in the world. Monterey (137,000) is another important northern city, with iron and steel works, cotton and flour mills, and manufactures of soap, tobacco, cement, and beer.

Merida (110,000) the capital of Yucatan State, stands in a flat, fertile region devoted mainly to the cultivation of henequen. There are factories for preparing sisal, and making soap and chocolate. Railways run to the ports of Progreso, which exports sisal, chicle, and hides, and Campeche (24,000), which exports logwood, sisal, and hides.

Tampico and Vera Cruz ('True Cross'), the two chief Mexican ports, lie on the Atlantic side, convenient for trade with the United States and Europe. Between them they share the bulk of Mexico's export trade, and the import trade in textiles and machinery from the United States and Britain. Tampico (70,000) stands seven miles up the river Panuco. Owing to the development of the oil-fields, it is the leading port and commercial centre of Northern Mexico. The city is well built, chiefly in the American style. Oil is conveyed in pipes from the wells to tanks and refineries on the river-bank, whence it is pumped into tank-ships. Vera Cruz (72,000) has been a seaport ever since Cortes landed there. It stands on a low, flat plain, formerly unhealthy, and not good as a port. But the Mexican Government has constructed a fine harbour, sheltered by a breakwater, and the city has been made healthy by modern sanitation and a supply of pure water. There is a big export trade in metals, coffee, tobacco, and sisal hemp, brought from the plateau by railway.

The Pacific ports are increasing in importance now that the Panamd Canal has given them close contact with the

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Atlantic. Mazatlan\ (51,000) is the chief Pacific port and commercial centre of Western Mexico. The harbour has been improved, and is a port of call for steamers going through the Panama Canal. The chief exports are metals, hides, fibres, and fruits. Manzanillo and Acapulco (21,000) have good harbours, and exports similar to those of Mazatlan.

EXERCISES

1. Draw a west-east section of Mexico (physical map) through Mexico City, and briefly state the geographical contrasts between west coast, east coast, and central plateau.
2. Give an account, illustrated with a sketch map, of Mexican mineral production and export.
3. Write an account of the farming industries of Mexico, indicating the probable lines of future development.
4. Write brief notes on (a) the Yucatan Peninsula, (b) the volcanic region of the Mexican Plateau, (c) the Tierra Caliente.

CHAPTER VIII

THE MAKING OF THE UNITED STATES

BY the middle of the eighteenth century a chain of British colonies extended from Nova Scotia to Georgia. In these lands, protected by the Appalachian Ranges, the settlers became predominantly farmers, well able to resist outside interference. By 1763 the menace of French domination had been destroyed, and Canada became British. But the colonists of New England were not long in breaking away from the motherland. The movement for independence was at first vague, and supported by a minority. But misunderstandings, largely due to the remoteness of America in those days, when it took three months to receive replies to communications, and failure in England to realize the true conditions in the colonies, led to the outbreak of hostilities in 1775 that ultimately resulted, in 1783, in the separation from Britain of the territories called, in the Declaration of Independence of July the 4th, 1776, the United States of America.

On gaining independence the original thirteen States held all land east of the Mississippi, with the exception of Florida. Settlers had penetrated to the Ohio Valley by two natural routes from Philadelphia and Baltimore across the Appalachians to Pittsburg. Others, known as 'back-woodsmen/' followed the celebrated Daniel Boone, who in 1769 had passed through the Cumberland Gap, farther south, into the plains beyond. In the century following the Declaration of Independence the United States expanded westward right to the Pacific Ocean. The French hold on the Mississippi Basin had always been weak—indeed, after the Seven Years War Spain had for a time

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held the land between the Mississippi and the Rockies—and Napoleon was only too ready to sell Louisiana to the United States in 1803 for £2,500,000. The tide of settlement, flowing from Europe, quickly spread into the new lands beyond the Mississippi. Indians were dispossessed of their lands by conquest or purchase.

The progress of the backwoodsman among the AUeghenies in the eighteenth century, of the frontiersman on the prairies, plains, and mountains, and of the Indian agent, acting for the Government under profitable contracts in the nineteenth century, does not make a glorious history to review, so far as it deals with native tribes.¹

Florida was bought from Spain in 1819, at a price of £1,000,000. The opening of the Erie Canal in 1825, giving continuous navigation from New York to Lake Erie, brought the heart of the continent into still closer contact with the Atlantic, and led to still more rapid settlement in the Middle West.

Having spread across more than half the continent, the United States came into conflict with Mexico. The bulk of the Mexican people lived in the south of Mexico, for reasons made clear in Chapter VII. Only small numbers of Spaniards had penetrated north into California, Texas, and New Mexico. Many United States citizens secured land in Texas, and later (1836) declared their independence. Texas was finally annexed by the United States in 1845. War² naturally followed, and when peace was concluded, in 1848, Mexico was compelled to give up not only Texas, but also the region now forming the states of New Mexico, Arizona, California, and Utah. In 1853 another piece of Mexican territory was bought for £2,000,000.

In the early nineteenth century American trappers,

¹ Professor W. M. Davis, of Harvard University.

² General Grant, the great Federal leader, afterwards described this war as "one of the most unjust ever waged by a stronger against a weaker nation."

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miners, and traders began to filter into the Pacific lands, crossing the western mountains by trails leading to San Diego and Los Angeles in the south, and by the famous Oregon trail in the north-west. The Oregon trail, 2400 miles long, led from Kansas City up the Platte River Valley, over the mountains to the Snake river, and so into the Columbia Valley. Thousands of settlers made the

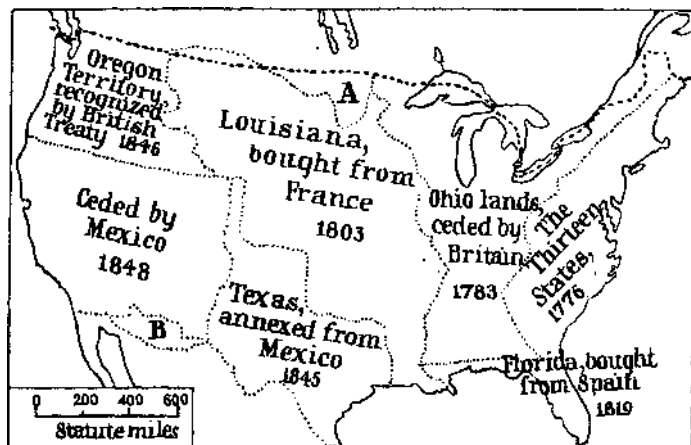


FIG. 37. THE GROWTH OF THE UNITED STATES

A, territory ceded by Britain in 1818; B, territory bought from Mexico in 1853.

arduous journey in covered wagons,¹ despite the hostility of Indians and the difficulties of securing water and food. Possession of the land south of British Columbia was disputed by Britain, but, as the result of an arbitration treaty in 1846, the Oregon region was awarded to the United States, the Canadian boundary being fixed as the forty-ninth parallel of latitude. The strength of the United States' claim lay in the work of their early explorers and the presence of 8000 American settlers in the region.

¹ *The Covered Wagon*, an excellent film, gives a vivid picture of the hardships of the Oregon trail.

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California¹ was effectively occupied as a result of the gold rush by the 'Forty-niners/ and before the end of 1849 the white population of California had increased from 4000 to over 100,000. These early settlers made their way south from the Oregon trail, branching off at the Snake river.

At first the various regions of the United States were loosely bound together, owing to the vast distances involved, the poor communications, the scanty population of all but the eastern states, and the differing interests of the manufacturers of New England, the farmers of the prairies, the cattle-ranchers of the Great Plains, the miners and lumberers of the Pacific mountains, and the cotton-planters of the Southern States. Two things helped to bring real unity: the American Civil War of 1861-65 and the construction of transcontinental railways.

The Civil War was caused by differences in population, occupations, and outlook, consequent upon different geographical conditions. The peoples of the North were in the main religious refugees. Their fine harbours and fishing grounds caused them to develop fishing and maritime trade; abundance of coal, iron, and water-power enabled them to develop manufactures, although the land itself was too stony and rugged for much profitable agriculture. The peoples of the South were mainly descendants of Cavaliers. They held large estates in a region suited to cotton, sugar, tobacco, and rice. Climatic conditions made plantation work uncongenial for white labourers: hence the maintenance of negro slavery as a necessary evil. The Southerners always wanted a loose federation, or union, of states, and when the Federal Government became strong, and was controlled mainly by Northerners, the Southern States felt that their own peculiar interests were threatened. On several occasions

¹ The short stories of Bret Harte, *Tales of the West*, and Mark Twain's *Roughing It* give an insight into the life in California in these early days.

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when the policy of North and South had been in conflict* the South had talked of leaving the Union, a threat that always made the North give way. A strong movement in the North against the policy of the slave-owning South culminated in 1860 in the election of Abraham Lincoln as President. Thereupon several Southern States decided to leave the Union, and become independent as the Confederate States. Only a minority of the whites were actually slave-owners, and it was for what they regarded as their freedom to govern themselves that they took the extreme step of breaking away from the rest of the United States; the abolition of slavery was simply the test question of all the issues at stake.

After a long and bitter struggle the wealth of the North in men and materials, guided by the burning faith of Lincoln, and the sound military leadership of General Grant, proved superior to the well-organized and brilliantly led resistance of the South, under its great soldier, Robert E. Lee. The country had finally asserted its determination to remain the United States in fact as well as in name, and incidentally slavery was abolished.

Railways, more than anything else, have enabled all parts of the United States to establish closer contact. The influx of gold-seekers into California made more urgent than ever the necessity of constructing transcontinental railways, and by 1869 there was direct railway connexion with San Francisco. Prior to that date so great were the dangers attendant upon sending gold by pack-mules across the Rockies that the precious metal was sent by sea to Panama, thence by a specially constructed railway to Colon, whence it was shipped to New York.

There are now forty-eight states in the Republic of the United States of America. The President is elected to office for four years. Congress, which consists of two elected Houses, the Senate and the House of Representa-

¹ A frequent cause of dispute was the Northern desire to prevent the adoption of slavery in new States entering the Union.

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tives, is the legislative body. The Central Government, established in Washington, the Federal capital, concerns itself with problems affecting the country as a whole: defence, foreign policy, tariffs—*i.e.*, duties, or taxes—on imported goods, and trade agreements. The Constitution¹ is a written one—unlike that of Britain—and changes of national policy, such as the introduction of prohibition, can only be effected by amending or altering the Constitution. Apart from affairs of national concern, the various states² are self-governing and independent.

Having established their unity, the United States were free to develop. Following the acquisition of the former Mexican territories stretching from Texas to California, "after a manner which the Americans had aptly inherited from their ancestors in Europe,"³ Alaska was purchased from Russia in 1867, for £1,500,000. As a result of the Spanish-American War of 1898 Porto Rico (now Puerto Rico), the Philippine Islands,⁴ and Guam, in the Marianne group, became United States possessions. Before the end of the nineteenth century the United States had also annexed the Hawaiian Islands (in 1898), and Tutuila, in the Samoan group, while in the present century they have gained control of the Panama Canal Zone, virtually occupied Haiti,⁵ and purchased the Virgin Islands from Denmark. Thus, within an amazingly short space of time, this young nation, born on Independence Day, July 4, 1776, has grown to the full stature of a world-Power.

The development of the United States during the nineteenth century was aided by their distance from Europe, with its international rivalries and wars. Attempts by European nations to interfere with American countries were forbidden by President Monroe's message to Congress

¹ *I.e.*, the set of laws, customs, and regulations under which the country is governed.

² Their average size is greater than that of England and Wales.

³ Professor W. M. Davis.

* Granted full independence from 1944.

* See page 113.

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on December 2, 1823, in which he declared that the American continents were henceforth "not to be considered as subjects for future colonization by any European Powers/' Only once has such interference occurred. During the American Civil War a French army sent to Mexico by Napoleon III conquered that country, and set up as emperor the Austrian prince Maximilian. The United States protested so vigorously that Napoleon withdrew his army, and the deserted Maximilian was captured and shot by the Mexicans in 1867. An American historian¹ writes as follows:

The enforcement of the Monroe Doctrine makes it necessary for the United States not only to defend the Latin-American republics against foreign aggression, but also to intervene from time to time in their domestic affairs. Our warships and soldiers have been repeatedly sent to the West Indies, Mexico, and Central America for the purpose of protecting American and European citizens and their property from rioters or revolutionists. Though grateful to her mighty neighbour for help, Latin America has trembled lest our intervention to restore order might pass into downright conquest. The benevolent purposes of this country are now being better understood. It has inaugurated a series of Pan-American conferences, composed of delegates from all the independent nations of the New World. With the assistance of the Latin-American republics, it has also established the Pan-American Union at Washington, which seeks to spread information about the resources and trade of the different countries and also to cultivate friendly relations between them.

Besides adopting a policy of "America for the Americans " the United States have tried to remain isolated from European affairs, and it was only after most careful deliberation, and under extreme provocation, that President Woodrow Wilson declared war on Germany in 1917. When the War ended America lost no time in breaking

¹ Professor Hutton Webster, University of Nebraska.

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away from the turmoil of European politics, but, although not officially a member of the League of Nations that came into being at the end of the War, she has always been willing to take a leading part in certain activities of the League, dealing with problems like the trade in dangerous drugs, slavery, disarmament, and the work of the Permanent Court of International Justice, at The Hague. It should not be forgotten that the Paris Peace Pact of 1929, in which all the leading nations agreed to abolish warfare as a means of settling disputes, was in the main the work of Mr Frank Kellogg, of the United States.

The United States include the greater part of the best lands of North America—lands fitted for development by Europeans. The eastern half of the country, which in all is twenty-five times the size of the British Isles, consists mainly of fertile plains, with sufficient rainfall for agriculture. To the native crops of maize, tobacco, and cotton were added wheat, barley, oats, and rye from the Old World, besides valuable animals—cattle, sheep, horses, goats, and pigs. The Appalachian coalfields, the immense supplies of iron near them, and the great food-producing areas farther west are within easy reach of Europe, whence adequate supplies of labour may be drawn, and where exports may find ready markets. The south-eastern states, the greatest cotton-growers in the world, have easy access to the textile manufacturing lands of Europe and New England. The minerals of the western mountains are valuable enough to stand the cost of transport to the east, while the Panama Canal permits of cheap transport for the timber, fruit, and minerals of the Pacific seaboard.

The peopling of the United States is one of the most remarkable stories in history. Europeans tend to settle in regions resembling their homelands. Thus South America is largely peopled by South Europeans (Spaniards, Portuguese, Italians), while Canada attracts the peoples of Northern Europe (British, Bretons, Normans, Germans, Scandinavians). In the United States the main elements

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are English, Scottish, Irish, German, Polish, Slavonic, and Italian—chiefly North European stocks, but not to the same degree as in Canada.

At the beginning of the nineteenth century the white population of the United States was only 4,000,000. These were almost all descended from the original settlers (overwhelmingly British) of the eastern states. They were responsible for transplanting British civilization and language into their new country, and they determined the lines of its economic and political development. During the nineteenth century there was a steady stream of immigrants,¹ attracted by the prospects of a new country, with plenty of work, free land, and opportunity for all, under a democratic republican Government. These immigrants were mainly British or Germans and Scandinavians, whose children, or grandchildren, tended to become American in speech and outlook. Of the British stocks one must emphasize the importance of the Irish. From 1820 onward Irishmen were the chief labourers, both in farming and public works—railways, canals, buildings. Irish immigration reached its maximum in the decade 1840 to 1850, when the potato famine of the "Hungry Forties" induced nearly 1,000,000 to leave their country. The Irish-Americans play a prominent part in farming, business, the professions, and politics—especially politics!

From about 1880 an ever-growing stream of immigrants poured in from Central and Eastern Europe (Poles, Czechs, Russians, Hungarians, etc.) and Italy, the greatest influx occurring during the decade 1900 to 1910, when 8,000,000 foreigners went into the United States. In general, these newcomers were difficult to transform into good American citizens; they could not so easily learn the English language; their manners and customs were at least very different from, if not inferior to, those of the majority of United States citizens. Many were uneducated and ex-

¹ An 'emigrant' goes *out* of his own country, and becomes an 'immigrant' *into* another land. See immigration statistics at page 151.

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tremely poor, so that they tended to crowd together as alien colonies in the poorer quarters of the great cities, rather than become prosperous farmers or skilled workers. During the Great War there was practically no immigration from Europe, but it was feared that when peace returned there would be a big influx from the war-shattered countries of Eastern and Central Europe. The United States thereupon decided that unrestricted immigration would be unwise, and established the Quota System, whereby only specified numbers of any one nationality are admitted. In order to maintain the balance of what were regarded as the best types of settlers, immigration has been largely restricted to British, German, and Scandinavian citizens.

During the nineteenth century, up to the period of the Civil War, the population of the United States increased every ten years by about one-third. Since that time the rate of increase has declined, the 1920 census showing an increase of under 15 per cent, as compared with that of 1910. The population according to the 1930 census was 122,775,000, a decennial increase of 16.1 per cent. Seventenths of the total population live east of the Mississippi, in a territory forming only three-tenths of the United States. The most densely peopled states are those bordering the Atlantic and the Great Lakes. Yet even the most densely peopled state—Rhode Island—is less densely populated than England, while the western two-thirds of the country have a lower density of population than the western counties of Scotland, with their barren moors, scattered farms, and small towns. In 1790 the population was rural, the largest city, Philadelphia, having only 42,000 people. But a change has taken place, especially in the last fifty years, during which the increase has been almost wholly urban, so that over half the people now live in towns. Only in the interior mountain states does the rural population increase more rapidly than the urban.

On the whole, the attempt to produce a nation from so

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many diverse elements may be regarded as accomplished, despite the presence of colonies of aliens in the great cities and some farming regions. These foreign elements will doubtless be assimilated * in time, despite their numbers, and it must not be forgotten that one-half of the white population is descended from the settlers of the eighteenth century.

Undoubtedly the most difficult problem in the United States is the colour question. Negro slaves were first shipped from Africa to the West Indies in 1501, and later, during the seventeenth and eighteenth centuries, the traffic was carried on chiefly in British ships. Slaves were first brought to the English settlements of North America in 1619, and as time went on hundreds of thousands of blacks were carried across the Atlantic. The tobacco plantations of eastern North America began to flourish, and the shortage of labour was met by introducing slaves. Later, other crops—rice, sugar, indigo, cotton—were grown with slave labour on the rich soils of the southern plains. As the soils were exhausted, cultivation was extended over larger areas, ultimately reaching almost to the Rockies. The white owners of the huge plantations were generally gentlemen of culture, who amassed wealth through their slave workers.

Prior to 1793 cotton fibres had to be separated from the seeds by hand, a process demanding cheap labour. In that year, however, the cotton gin—*i.e.*, 'engine'—was invented for separating fibre from seeds by pulling it through a comb. This simple mechanical process so reduced the price of cotton that it became a common necessity, instead of an expensive luxury, and in the United States the vast extent of cheap, fertile lands led to a rapid development in cotton-planting and, of course, a demand for more slaves.

In 1806 Great Britain stopped the slave traffic, and in

¹ *I.e.*, absorbed into the general mass of people as real American citizens.

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1833 abolished slavery throughout the Empire. But in the Southern States of North America slavery was regarded as such a necessity for prosperity that abolition was not achieved until the end of the Civil War. But abolition of slavery did not solve the problem of the future of the negroes. The former slaves became free wage-earners, with the same rights and privileges as white citizens—in theory. In actual practice, however, the negroes are anything but the equals of the whites, especially in the South, where the majority of the coloured people live. They have to travel in separate railway compartments; they must attend their own special churches and schools—in fact, they are treated as inferior to the whites, and regarded as incapable of exercising the rights of citizenship. Happily the relations between black and white are improving. It is now realized that even in the Southern States the negroes are unlikely to swamp the whites. In 1790 the blacks formed one-fifth of the population of the United States; in 1920 they formed less than one-tenth, and the whites in the Southern States are actually increasing more rapidly than the blacks.

Attracted by higher wages, greater freedom, and superior conditions of life, large numbers of negroes have left the South, and now live in the great cities of the North-eastern States, where they form separate colonies, such as Harlem, in northern Manhattan Island, New York. Many have become highly educated men, brilliantly successful as clergymen, teachers, doctors, lawyers, bankers, actors, etc. They claim for their fellows an adequate education, just wages, the right to vote, and, above all, freedom from the perpetual "degradation that labels them as though they were members of another and a lower, almost a sub-human, species."¹ Some negro leaders believe that freedom can only be achieved by force. Others, following the great Booker Washington, believe in slow, steady progress by the education of the negroes,

¹ *The Clash of Colour*, by Basil Mathews.

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and by patient co-operation with the whites. It is undoubtedly along such sane lines that coloured peoples all over the world can take their rightful share in the progress of mankind, for, given equal advantages, they have proved capable of attaining the same degree of civilization and culture as white men.

The rapid development of the Pacific States, especially California, resulted in a serious shortage of labour, which was largely satisfied by an influx of Chinese and Japanese. These Asiatics are accustomed to a lower standard of living than that of Europeans, and, being industrious and thrifty, many (particularly the Japanese) have amassed wealth and possess extensive lands. California has long feared the growing power of the Japanese immigrants, and has made laws restricting their rights and their ability to purchase land. Japan naturally resents what she regards as unfair treatment, the more so since Japanese have now been completely prohibited from entering the United States as settlers. Here, then, is another colour problem.

The relations between white and coloured peoples is the greatest problem of our time. By the end of the nineteenth century nearly nine-tenths of the habitable world had come under the domination of white peoples, and in the British Empire alone six of every seven people are coloured. Within the past generation there has been a rapid" awakening among the coloured peoples—especially since the Great War. No longer are they content to be controlled by whites who treat them as inferior beings. The colour problems have to be faced and solved, not by continued white domination, but by honest, equal co-operation throughout the world of all peoples, no matter what their race, for they all have their own special part to play in the onward march of human civilization. It is important to remember that the responsibility of solving the existing racial problems rests overwhelmingly upon two great peoples: those of the British Commonwealth and those of the United States.

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POST-WAR IMMIGRATION STATISTICS

YEAR	BRITISH	GERMAN	SWEDISH, NORWEGIAN, DANISH	AUSTRIAN AND HUNGARIAN	ITALIAN	POLISH	FRENCH	TOTAL OF ALL IMMIGRANTS
1921	79,577	6,803	22,854	12,649	222,260	10,193	9,552	805,228
1925	53,822	46,068	16,784	1,515	6,203	2,255	3,906	294,314
1930	54,460	26,569	6,919	3,009	22,327	9,231	3,713	241,700
1931	16,415	10,401	3,133	1,625	13,399	3,604	1,830	97,139
1936	2,005	6,073	521	1,084	2,467	1,250	464	36,329

The effects of the immigration restrictions and of the world trade slump of recent years are strikingly in evidence in the great reduction of immigrants. Indeed, the tendency now is for more aliens to leave than to enter the United States. For example, in 1926 304,488 aliens entered and 76,992 left the United States. But in 1933 there were 150,728 alien arrivals (including 23,068 immigrants admitted by quota), and 243,802 aliens left the country.

EXERCISES

1. Write an essay describing the expansion of the United States.
2. The United States are sometimes described as a 'melting-pot' of races. Explain the meaning of the term, and discuss the population problems involved.
3. Write brief notes on the negro and Red Indian peoples of the United States, and suggest possible future developments, with reference to their status in America.
4. Make a list of any stories you have read dealing with life in the United States. Sketch briefly the outstanding characteristics of the two that have most impressed you.

CHAPTER IX

THE RESOURCES, COMMUNICATIONS, AND TRADE OF THE UNITED STATES

THE United States are virtually a continent in size, and in manifold resources. Fertile soils and varied climates have made the country a leading agricultural land. Its extensive grasslands support millions of animals, while the lakes, rivers, and coastal waters abound in fish. There is a sharp contrast between east and west. The west (about two-fifths of the country) is mountainous, with considerable areas of bare rock, arid desert, and poor pasture, although here and there are regions of great fertility, such as the Californian Valley. The eastern three-fifths are* in general low-lying and well-watered. Cultivation is widespread, the crops varying with climate: wheat in the north; farther south maize; in the Southern States cotton. The importance of agriculture may be gauged from the average annual production for the years 1928, 1929, and 1930, and for 1934, 1935, and 1936.

CROPS	ACREAGE (1060 ACRES)		PRODUCTION (1000 BUSHELS)		BUSHELS PER ACRE	
	1928-30	1934-36	1928-30	1934-36	1928-30	X934-36
Maize	99,816	93,356	2,504,649	1,766,338	25.1	18.9
Wheat .	59,630	49,483	858,339	593,066	14.4	12.4
Oats	41,125	34,166	1,356,601	842,103	33.0	23.9
Barley .	12,701	9,082	328,758	183,302	25.9	19.5
Rye	3,5"	2,978	45,170	33,740	12.9	10.6
Flaxseed	3,224	1,424	20,220	8,696	6.3	5.9
Rice	935	868	41,690	41,555	44.3	48.3
Potatoes .	3,523	3,399	395,163	374,161	XII-8	81.6

In several of these commodities the United States are

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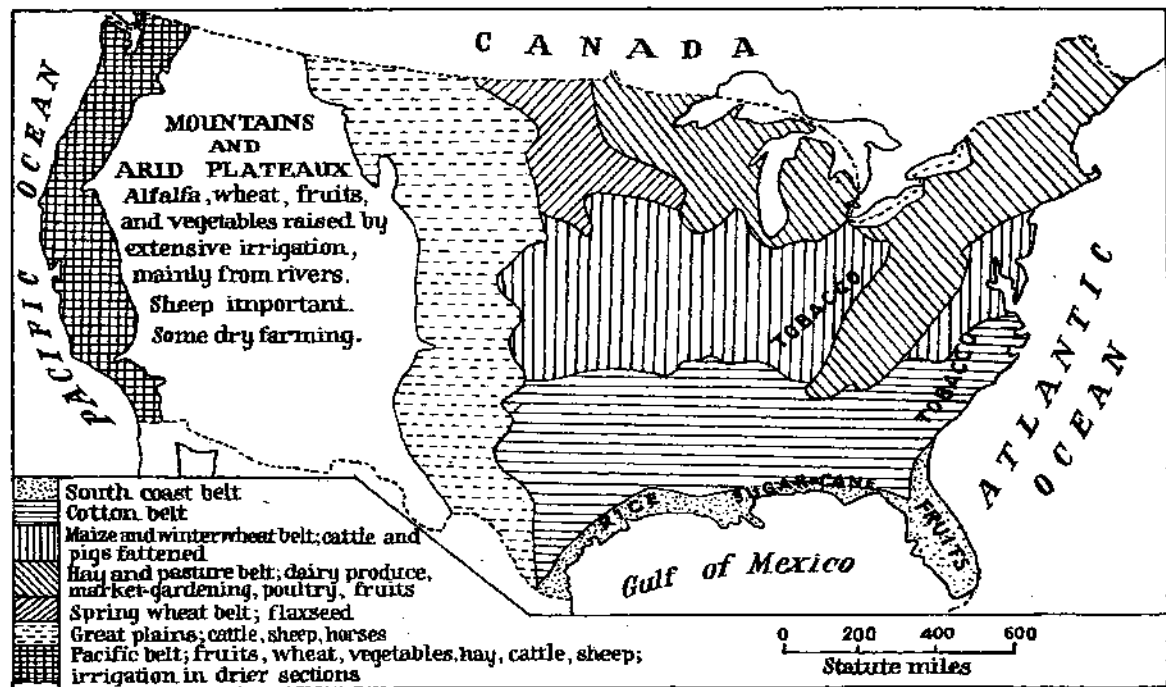


FIG. 38. THE FARMING REGIONS OF THE UNITED STATES

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the greatest producer in the world, despite the reduced output, of recent years. The United States crop of wheat is twice, and of oats, barley, and rye each three times the production of Canada. In cotton the United States stand supreme, with over half of the world production. The output of sugar, both cane and beet, hay, tobacco, and other crops is also of enormous value. No other country possesses such wealth in animals, as the following tables, based on recent estimates, will show:

ANIMALS	UNITED STATES	ARGENTINA	AUSTRALIA
Cattle	66,676,000	32,212,000	14,049,000
Sheep	52,576,000	44,413,000	112,282,000
Horses	11,527,000	9,858,000	1,768,000
Pigs.	42,774,000	3,768,000	1,158,000

In the early nineteenth century the United States were devoted to agriculture, animal-rearing, and mining. The most striking feature of the last fifty years has been the incredibly rapid development of manufacturing industries, together with the huge increase in the mining of coal and other minerals on which they depend. Until late on in the nineteenth century Great Britain was easily the greatest iron-manufacturing country; but after the invention of the Bessemer process¹ for making cheap steel the United States rapidly began to outstrip all its rivals, especially from the time of the formation in 1886 of the Carnegie² Steel Combine at Pittsburg. In recent years the United States have produced nearly half the world's steel, as compared with about one-tenth by Great Britain. Coal and iron are the bases of modern industry, and when one learns that the United States produce over one-third

¹ This was invented in 1856 by Henry Bessemer, an Englishman of French ancestry. The process was first employed in the United States in 1865. Most of the steel now made is 'open-hearth' steel, more costly than Bessemer steel, but of finer quality.

² Andrew Carnegie was an industrial organizer of unsurpassed genius.

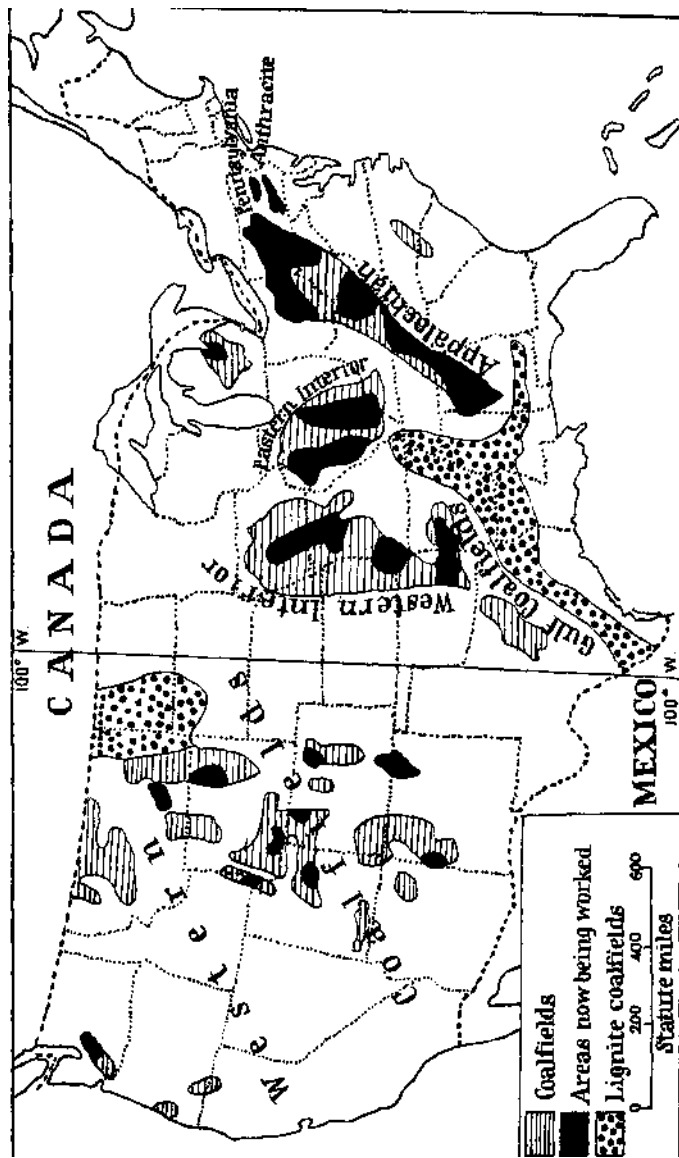


FIG. 39. THE UNITED STATES COALFIELDS

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of the world's iron and one-half of its coal no further explanation of American industrial supremacy is necessary.

COAL

The United States contain about half the world's coal resources, in numerous coalfields which may be classified into five groups, as shown on Fig. 39.

1. The *Appalachian Coalfields* are the most important. They extend from Pennsylvania to Alabama, and produce over three-quarters of the total United States output. In Eastern Pennsylvania there are huge quantities of anthracite coal; the output in 1935 was 51,003,000 tons. Anthracite has played a big part in the industrial development of the north-east, and much of it goes by rail and the Great Lakes to the central states and Canada. Most of the coal, however, is bituminous—the ordinary coal used in coke-ovens or domestic grates—the output in Pennsylvania alone reaching 89,826,000 tons in 1934. Bituminous coal is found in nine of the Appalachian states, the annual output being roughly that of Continental Europe. In general, the coal seams are horizontal, thick, and near the surface, and in some cases cut through by deep valleys. Hence mining is comparatively easy and cheap, for coal-cutting machinery can be employed to a far greater extent than in British mines. Railway wagons and river barges convey the coal to Pittsburg and the industrial centres of Ohio, and to the ports of Lake Erie for transport along the Great Lakes. Great quantities are also sent to New York and other eastern ports. On the average, lengthy transport makes the coal dearer than in England.

2. The *Eastern Interior Coalfield* lies in Indiana, Illinois, and Kentucky. The coal is not of such good quality as the Appalachian, but finds a ready market in the surrounding region.

3. The *Western Interior Coalfield* extends from Iowa,

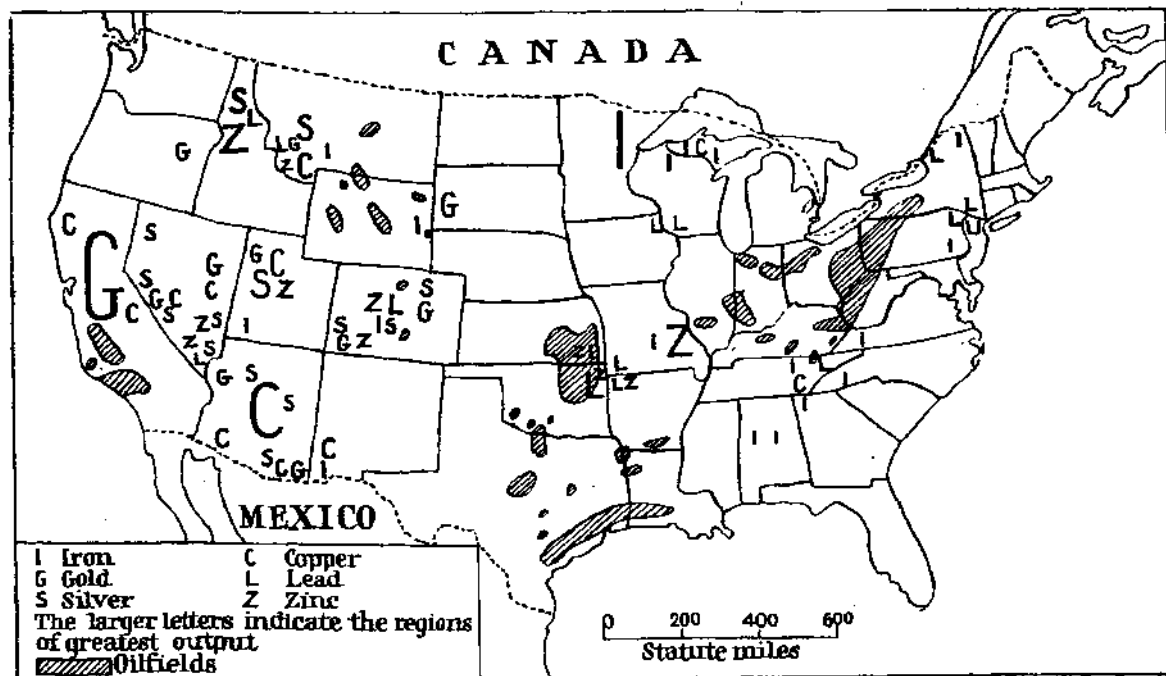


FIG. 40. IMPORTANT MINERALS OF THE UNITED STATES

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through Kansas and Missouri, into Oklahoma, and is of local importance.

4. The *Gulf Coalfields* border the Gulf of Mexico, from Southern Alabama to Texas, but as most of the coal is lignite, which retains much of a woody nature, it is not of much importance in competition with the coal of adjoining states.

5. The *Western Coalfields* are scattered throughout the mountain states, but here again a good deal of the coal is lignite. The most developed western coalfields are in Wyoming, Colorado, and Washington, which supplies Pacific steamships.

MINERALS

Iron ores are widespread in the United States, but about two-thirds of the present supply is obtained from the south-western shore lands of Lake Superior. In Alabama there are still greater reserves of iron ore. Fuller accounts of the iron industries are given in later chapters.

Of other metals copper is easily the most important, the output being over half the world's supply. The chief producers are Arizona, Montana, and Utah, in the west, and Michigan, on the southern shores of Lake Superior. The ores are smelted near the mines, but refining is carried on in the Atlantic ports. The enormous demands for copper are due to the great modern electrical industries.

The United States have a big share in the world's production of lead (over one-third), zinc, silver, mercury, and bauxite (aluminium ore). There are huge supplies of sulphur near the Gulf of Mexico in Louisiana and Texas; of phosphorus in the south-eastern states and the Rockies; of salt and building stones in many regions. But the country is deficient in supplies of metals (manganese, vanadium, tungsten, molybdenum) used in making the special steel alloys so vital to modern engineering. Additional supplies of potash and nitrates for manures and the manufacture of chemicals, and almost the whole

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requirements in tin, platinum, and nickel have to be imported.

PETROLEUM

To coal, iron, and copper, as the chief mineral bases of industry, must be added petroleum. The United States produce over 60 per cent, of the world's petroleum.¹ The industry is very modern, for the first wells were sunk in 1859, in Western Pennsylvania, where towns sprang up with magical rapidity, and immense fortunes were made by the gushing wells. This Appalachian oilfield extends from New York State to Kentucky, but the supplies have been drained so rapidly that it now produces only a small fraction of the national output. Farther west the supplies in Ohio, Indiana, and Illinois have greatly declined, and the yield is even less than in the Appalachian region. By far the most productive region stretches from Kansas, through Oklahoma and North-eastern Texas, into Louisiana. From 1,000,000 barrels in 1903 the annual output of this region has risen to well over 700,000,000 barrels, the greatest producers being Texas and Oklahoma. Oil is also obtained from the coastal belt of Texas and Louisiana. Wyoming, Colorado, and Montana share in the petroleum of the Rockies, but the greatest western producer is California, whose output almost equals that of Texas.

Extensive networks of pipes (six to twelve inches in diameter) convey the oil to the big ports of the Great Lakes or the Atlantic coast, where there are refineries, although much of the oil is refined on the oilfields. Of the 60,000 miles of pipe-lines the most striking length is that linking Wyoming to Kansas City, and thence to the Atlantic ports, crossing two-thirds of the continent. Modern refineries are extensive works, where the crude

¹ Petroleum ('rock-oil') is frequently called simply 'oil.' Our word 'petrol' is an abbreviation of 'petroleum.' In America the term •gasolene/ or 'gas,' is used.

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oil is heated in large tanks, so that one product after another is distilled and collected. Petroleum yields petrol, paraffin oil (kerosene), lubricating oil, paraffin wax, tar, and benzine. Further processes produce vaseline and other commodities, while the tar yields the aniline¹ dyes that have largely replaced vegetable dyes, such as indigo.

Despite their huge production, the United States' consumption of petroleum has grown so much that increasingly greater supplies are imported from Mexico, Venezuela, and other countries. But there is still a big export trade in refined oil for lamps and motor-car engines. Probably within another generation the oil supplies of the United States will be so far exhausted that petroleum will have to be obtained from other sources, such as the oil-shales of the western mountains.

The origin of petroleum is uncertain, but is thought to be due to the decay of animal or vegetable remains in the rocks. It is most commonly found in porous rocks, such as sandstone, imprisoned with water and natural gas by non-porous rocks lying above it. The light gas rests on the petroleum, which in turn lies on the denser water. When a well is bored the force of imprisoned gas is generally sufficient to force out the petroleum at a great rate. Natural gas is of great value as fuel; indeed, it is superior to, and cheaper than, gas manufactured from coal. Unfortunately immense quantities have been so carelessly wasted that supplies in some areas are becoming exhausted.

WATER-POWER

Water-power is most abundant in mountainous regions with good rainfall throughout the year. In a dry season the power may be greatly reduced, unless sufficient water is stored in lakes or in artificial reservoirs. Water-power has long been employed in small works in the Eastern United States, but after the Civil War attention was

¹ The word 'aniline' itself is from the Portuguese word for indigo.

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turned to the large-scale utilization of water-power for the generation of electricity for big factories. It is not always convenient to establish works near the streams—raw materials and workers may not be at hand. But electric power—'white coal'—can be transmitted long distances by cables to points where it can best be employed. Coal will in time be worked out, but water-power furnishes electrical energy that can never be exhausted. On this account, while steam supplies four-fifths of the United States' power, hydro-electric power is being increasingly adopted. The production of over 50,000,000 horse-power is possible, and in 1930 14,885,000 horse-power had been developed—more than twice the developed water-power of Canada. This is employed in manufacturing industries, on railways, and for electric lighting and heating. In New York State and New England great manufacturing industries of wood-pulp, paper, and cotton are supplied with abundant power, for the Northern Appalachians are rugged, they have heavy rainfall, and—owing to the Ice Age—thousands of storage lakes. (See page 39.)

In three other regions water-power is available on a big scale: (*a*) the Southern Appalachians, with their abundant rainfall and swollen rivers; (*b*) the regions adjoining Lakes Superior, Michigan, and Huron, where there are numerous falls and glacial lakes; (*c*) the western mountains, where heavy rainfall, glaciers, and snows provide about 70 per cent, of all water-power available in the United States, although very little of it has been developed. The greatest scheme in operation is that of Niagara Falls. About 1,000,000 horse-power is generated, and used as far as Detroit on the west, central New York State on the east, and Toronto on the north. At Keokuk, Iowa, the Mississippi has been dammed to supply 200,000 horse-power to St Louis and the region north of that city. The water-supply of Los Angeles is brought over 200 miles from the mountains, and furnishes, in addition, 50,000 horse-power. New power developments are those

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of the Columbia river (Washington State), the Boulder Dam on the Colorado river, and the Norris Dam, near Knoxville, on the Tennessee river.

TIMBER RESOURCES

The United States had originally two great regions of forests: in the east there were over 1,000,000 square miles, and in the west—beyond the prairies—nearly 300,000 square miles. But so rapidly has this timber been cut down in the east that Pennsylvania,¹ New York, and Michigan—formerly great producers—now find it increasingly necessary to import supplies from other regions. The timber reserves of the northern industrial states are relatively small, for no serious attempt at afforestation had been made until recent years, when the danger of a timber shortage was realized. Three-quarters of the country's reserves of timber stand in the west, over one-half being in Washington, Oregon, and California. The United States is still one of the leading timber countries, but the forests have rapidly dwindled, owing to enormous consumption of timber, careless waste of good lumber, forest fires, which destroy on the average over £3,000,000 worth of timber every year, and insects, disease, and storms, which together do even greater destruction than fires. To prevent further waste the Federal and State Forest Services control 154,000 square miles of forests, and hundreds of millions of trees are planted annually.

COMMUNICATIONS

Three hundred years ago the only lines of communication in the United States, apart from rivers, were the narrow trails, used for countless generations by the redskins. As these trails followed the easy gradients of river valleys, and crossed highlands by the lowest passes, they

¹ It is significant that this state, called after William Penn, has in its name the Latin word for 'forest.'

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became the routes by which pioneer Europeans penetrated westward, by pack-horse and, later, covered wagon. Until the end of the eighteenth century metalled roads were unknown in America, and travel by wagon or stage-coach over the roughly cleared earth roads was painfully slow. For example, the first post rider in 1773 took a fortnight to ride from New York to Boston; in 1782 the stage-coach did the journey in six days, and by 1792 the time had been reduced to three days. The journey by train now takes five hours. The construction of good roads began in the early nineteenth century, from the necessity of linking the developing central states with the eastern ports. As also happened in England, the advent of railways almost abolished the need for good roads in the United States, and modern developments are entirely due to the invention of the bicycle, closely followed by that of the motor-car. During the past thirty years neglected roads have been repaired and improved, and new roads of broad surface have been constructed over more and more sections of the country. There are over 3,000,000 miles of public roads, of which 694,000 are metalled, and (on January 1, 1930) 26,653,450 motor-vehicles.¹ In tiny Britain the automobile has become a serious rival of the railway. But in the vast territories of the United States the automobile is a means of linking all parts of the country with the railways, and bringing the population of remote districts into closer contact with the great cities and the main arteries of trade.

RAILWAYS

In 1850 there were only 9000 miles of railway in the United States, but, following the Civil War, there was an incredibly rapid expansion, and by 1900 the mileage had risen to 198,964. The present total is 254,300 miles—five times that of Canada, and ten times that of Australia.

¹ The world total of motor-vehicles was 35,127,400, of which the United Kingdom possessed 1,456,500.

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Before the construction of railways the Mississippi river system had been the great highway for the central and western states.¹ But there was always a strong tendency for trade from these regions to connect up with the Great Lakes, and with the Atlantic ports, especially through the Mohawk Gap. The construction of east to west main lines—so conspicuous a feature of the railway map—has therefore greatly assisted the development of the western states, and strengthened their bonds with the original thirteen states of the Union, while the traffic of the Lower Mississippi has declined.

The network of railways is closest in the vast plains of the eastern half of the country, especially in the states most intimately connected with the Atlantic, the Great Lakes, and the Upper Mississippi. The lines from the Atlantic ports are confronted with the barrier of the Appalachian Mountains. From New York the route follows the easy gradients of the Hudson and Mohawk Valleys, giving connexion with Buffalo and Chicago. Chicago is also joined to Philadelphia by the shorter, but more difficult, route of the Pennsylvania Railroad, which passes through the Susquehanna river gap at Harrisburg. From Washington another trunk line follows the Potomac Valley to Cumberland, whence one branch goes on to Pittsburg and Chicago and another to Cincinnati and St Louis. The development of Boston was hampered by the difficult mountain ridges behind the city, until the construction of the costly Hoosac tunnel.

The most striking railways are the transcontinental lines, which must cross the Western Cordilleras in order to join the Pacific Coast with the railway network that stretches east of the Mississippi Valley. The first transcontinental line was completed by the opening of the Union and Central Pacific Railroads, constructed by the Government with the definite object of strengthening the

¹ Mark Twain's *Life on the Mississippi* gives a vivid picture of these days.

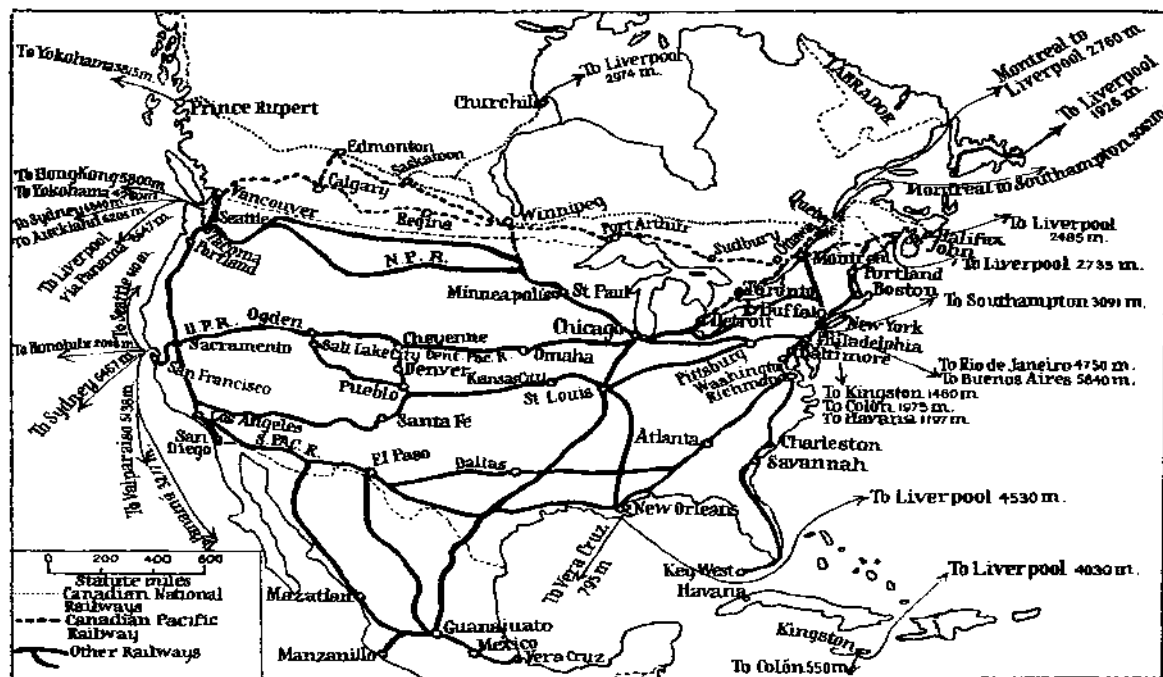


FIG. 41. THE CHIEF RAILWAYS AND SHIPPING ROUTES OF NORTH AMERICA

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ties between east and west. The New York Central Railroad runs north for nearly 150 miles along the Hudson Valley to Albany, and then strikes west through the Mohawk Gap to Buffalo. Following the shores of Lake Erie, it passes through Cleveland, and continues westward to Chicago, whence several lines reach Omaha, the eastern terminal of the Union Pacific Railroad, near the confluence of the Platte and Missouri. Following the Platte Valley, the Union Pacific reaches Cheyenne, at the foot of the Rockies, and the mountains are crossed by Evans Pass, at 8240 feet. The route now traverses the Great Basin to Ogden, near the Great Salt Lake. From Ogden the Central Pacific Railroad crosses the Great Salt Lake by a long bridge, and then follows the Humboldt river across the desert of Nevada. Beyond the final obstacle of the Sierra Nevada the line crosses the fertile California Valley to San Francisco, the western terminus. Tremendous obstacles and dangers had to be faced before the workers from the west met those from the east, and the last spike—of solid gold, presented by California—was driven on a summer's day in 1869.¹ From New York a journey to San Francisco by this route covers the 3250 miles in about four complete days. From Ogden several lines run to Pacific ports. One follows the old Oregon trail along the Snake and Columbia valleys to Portland.

The Northern Pacific Railroad starts from Duluth and St Paul; and uses the valleys of the Yellowstone and Columbia to reach Portland, Tacoma, and Seattle. The Southern Pacific connects New Orleans and Galveston with Los Angeles and San Francisco, by way of El Paso and the desert of Arizona.

The Pacific states send east by rail their fresh and dried fruits, besides commodities imported from Asia, such as tea and silk. But the heaviest traffic is lumber to supply the big demands of the eastern states. In return, the east

¹ *The Roaring U.P. Trail*, by Zane Grey, gives a vivid account of the construction of this line.

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sends manufactured goods, and grain and other foodstuffs from the Mississippi plains.

WATER TRANSPORT

The great highways of the colonial period were the rivers. The rivers of New England and the other Atlantic colonies gave access to the interior. Large vessels could reach the tidal limit, whence smaller craft could penetrate the upper reaches. Beyond the Appalachians the Ohio furnished a useful route to the west, and of the settlements on its banks the most important are Pittsburg, Cincinnati, and Louisville. The traffic on the Ohio and Mississippi became exceedingly important, and from 1840 to 1869 the tonnage on the Mississippi rivalled that of the great Atlantic ports. During the Civil War the Mississippi was closed, and afterwards the river never recovered its former volume of traffic, which largely went east on the rapidly- extending railways. The Upper Mississippi, between Minneapolis and St Louis, still carries an immense volume of traffic, but the Lower Mississippi is little used. The Ohio, however, has maintained, if not indeed increased, its traffic, almost wholly in coal. Other Mississippi tributaries are navigable, the Missouri being navigable for steamers for 2000 miles.

The first artificial waterway in America was the Erie Canal, completed in 1825 by New York State to connect the river Mohawk with Lake Erie. By joining the Hudson river and the Great Lakes it helped to decide that of the eastern ports New York, at the mouth of the Hudson, should become the greatest. The Erie Canal at once became a route of first-class importance. Its eastern end was joined to Lake Champlain, and so to the St Lawrence, while another branch from the middle of the canal was cut to Oswego, on Lake Ontario. After 1880 the tonnage carried on the Erie Canal began to decline, but the deepening of the channel to twelve feet about thirty years ago

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has led to an increasing barge traffic, and a recent proposal to deepen it to twenty feet would enable lake steamers to utilize it. It is now known as the Barge Canal,¹ and can take barges of 1000 tons, as compared with 250 tons on the old canal.

The development of canal and river transport was arrested by the introduction of railways, which have the

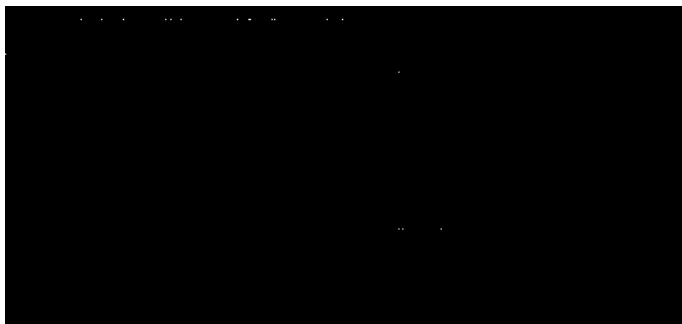


FIG. 42. LOCK ON THE SAULT STE MARIE CANAL
Vessels are descending from Lake Superior to the level of Lake Huron.
By courtesy of the Canadian Pacific Railway

advantage of speed, and are not affected by the severe winters that freeze the waterways. There is now a tendency, however, to make greater use of water transport for bulky commodities, such as coal and ores. One great scheme that is nearing completion is the Intracoastal Canal system, intended to provide sheltered waterways from New England to Florida, by linking up a series of canals, lagoons, and short sea passages.

¹ The Barge Canal and its branches provide 440 miles of canal and 350 miles of canalized river and lake.

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The greatest system of transport in the whole of the Americas is the Great Lakes. The low falls of Sault Ste Marie, between Lakes Superior and Huron, have been avoided by the two 'Soo' ship canals, one in Canada and one in Michigan State, free to all ships. Through the rock ledges of St Clair Rapids, between Lakes Huron and Erie, a channel has been blasted and dredged to allow steamers to pass on without canals or locks. From the south the traffic of Lake Michigan enters Lake Huron through a wide channel, the two lakes being at the same level. The only serious obstruction on the Great Lakes system is Niagara Falls, between Lakes Erie and Ontario, avoided by the Canadian Welland Canal. A new Welland Ship Canal, with a minimum depth of thirty feet, was completed in 1930. (See pages 265-266.)

The Great Lakes, together with the St Lawrence, furnish a route from the Atlantic to the farthest shores of Lake Superior—a distance of 2500 miles. The lake shores are so low and flat that railways can approach at almost any point. The shipping using the Sault Ste Marie Canals is several times the tonnage—but not the value—of that passing through the Suez or Panama Canals.

Iron ore, pig-iron, steel, coal, coke, cement, sand, gravel, lumber, rubber, cotton, wheat, corn, oats, flaxseed, cattle and hogs—these are the things that glide and dump, bellow and squeal, make dust, smoke, tonnage, jobs and profits in this region of cities; cities which the lakes have created.¹

Besides the project to deepen the Erie Canal for lake steamers, there has long been a proposal to deepen the St Lawrence waterways in order to permit ocean-going vessels to enter the Great Lakes, and also to develop hydro-electric power. This work involves co-operation with Canada, and the joint board of engineers appointed by the two Governments in 1924 has already submitted two possible schemes of development.² Canada will

¹ *North America*, by Professor J. Russell Smith.

² Negotiations for the making of the necessary treaty began in 1931.

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The following tables showing the principal exports and imports of the United States should be carefully studied:

CHIEF EXPORTS FROM THE UNITED STATES IN 1936

EXPORT	VALUE (\$1000)	EXPORT	VALUE (\$1000)
Machinery .	937,794	Tobacco and manufac- tures	147,898
Petroleum and its pro- ducts	503,711	Animal products ,	124,221
Raw cotton .	361,043	Chemicals	116,962
Cotton manufactures	54,877	Fruits and nuts	80,607
Motor-cars and parts	240,205	Copper and manufactures	50,663
Wood and manufactures	158,677	Cereals and manufactures	48,906
Iron and steel and manu- factures	149,810	Rubber and manufactures	33,299
		Total of all exports	2,416,000

CHIEF IMPORTS INTO THE UNITED STATES IN 1936

IMPORT	VALUE (\$1000)	IMPORT	VALUE (\$1000)
Paper and wood-pulp .	388,587	Wines and spirits .	75,272i
Wood products	279,531	Petroleum and products	63,527
Raw rubber .	158,731	Vegetable oils and fats .	62,842
Cane sugar .	155,399	Fruits and nuts	57,972
Coffee	133,962	Hides and skins .	54,76i
Raw silk	102,351	Iron, steel, and alloys	42,151
Cereals and manufactures	84,468	Oil-seeds	37,030
Wool and manufactures.	82,912	Copper and manufactures	29,884
Tute and manufactures .	81,748	Tobacco	29,880
Furs and manufactures .	81,607	Works of art	25,880
Chemicals	79,976	Cotton and manufactures	22,555
Tin	75,45i	Total of all imports	2,421,000

Despite a big export in certain commodities, it is found necessary to import additional supplies. Cotton is a leading export, but fine-quality Egyptian cotton is imported for making special goods. The case of petroleum has already been discussed (page 160). Alongside an immense production of iron ore, and a huge export of iron and steel goods, there is a considerable importation of

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iron, and of certain articles made of special steels. Other commodities which figure in both imports and exports are copper, wheat, and tobacco. It is important to note the great dependence on imported coffee, silk, rubber, sugar, hides and skins, paper, wood, wool, and tin.

The great dependence of the United States upon their trade with Canada and the United Kingdom is revealed in the statistics for the years 1930 and 1936.

EXPORTS TO	VALUE (\$1,000,000)		IMPORTS FROM	VALUE (\$1,000,000)	
	1930	1936		1930	1936
United Kingdom	824	440	1 Canada .	490	376
Canada .	903	384	1 United Kingdom	311	200
Japan .	260	204	1 Japan	383	172
France .	257	130	• British Malaya	205	168
Germany	402	101	Cuba	182	127
Mexico .	128	76	Brazil	194	102
South Africa	52	70	Philippines	122	99
Cuba	124	67	China	162	83
Philippines	77	60	Germany	235	80
Italy	147	59	1 British India .	141	70
Belgium .	109	59	Dutch East Indies .	78	70
Australia	136	58	Argentina	106	66
Argentina	190	57	France .	158	65
China	153	55	Belgium .	64	59
Netherlands	127	53	Netherlands	78	50
Brazil	97	49	Mexico .	112	49
Sweden .	52	43	Sweden .	53	48
Russia	91	33	Colombia	98	43
Total of all exports	4694	2453	• Total of all imports .	3849	2419

In addition to this great foreign trade, the extremely important home trade must not be overlooked. Referring to the trade of his country, Professor A. P. Brigham writes:

Cotton is in the South, iron is in the East, and petroleum in the West. The southern fringe raises tropical fruits, the 'ral region wheat and corn, the central and western area ^ces meat, and manufacture gathers in the North and More than half our people are urban, and to be urban 'o depend on trade. If now we regard distances in

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home exchange, it is like the Scandinavian peninsula bartering with Spain, France exchanging with the Danube countries, or the United Kingdom selling to Italy and the eastern lands of the Mediterranean. And let it not be forgotten that in all this continental sweep of the commercial stream there are no tariff barriers.¹

NATIONAL PARKS

As civilization advances people realize the value of open spaces for healthful recreation away from the crowded cities. With excellent forethought for the needs of a growing nation, the United States Government has secured as national parks nineteen regions, some of great size. Apart from one on a small island off the coast of Maine, and another in Arkansas, the national parks are all in the west. The first acquired, and best known, is the Yellowstone Park, which is larger than Devonshire. The Yellowstone Park, mainly in North-west Wyoming, is a plateau section of the Rockies, covered with sheets of lava, cut up by gorges, and abounding in geysers,² hot springs, and mud volcanoes. The wild beauty of the scenery is enhanced by the brilliant colouring of the mineral deposits from the hot springs and the dark green of the coniferous forests that clothe the mountain flanks.

Other parks worthy of note are Glacier Park, Montana, with its sixty glaciers and 250 lakes; Mount Rainier Park, on the Cascade Mountains of Washington, its beautiful volcanic cone fringed with twenty-eight glaciers; and, in California, Yosemite³ Park, with its precipitous canon and stupendous waterfalls, and Sequoia Park, which preserves 12,000 giant Sequoia trees, many over 250 feet in height.

¹ *The United States* (University of London Press).

² A geyser is a hot spring which forcibly ejects a column of water at intervals.

³ Pronounced 'Yo-sem-i-te.'

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In all these national parks the wild life of plants, animals, and birds can flourish without fear of destruction, and afford good health and delight to future generations, when the United States population is much greater than at present.

For census purposes the United States Government

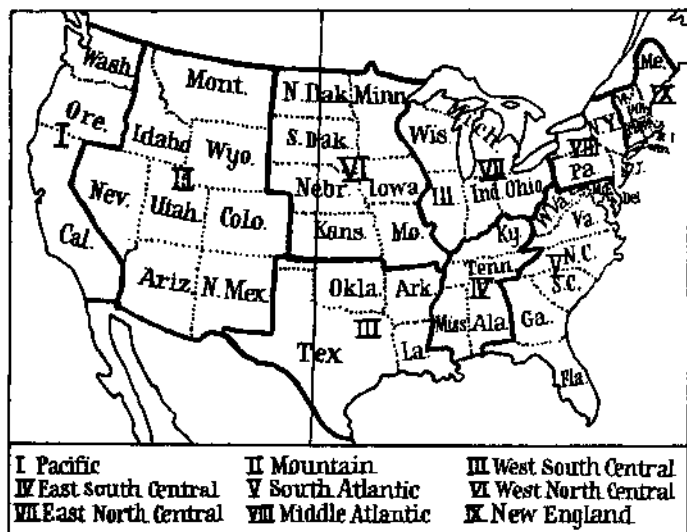


FIG. 43. GEOGRAPHICAL DIVISIONS AS RECOGNIZED BY THE UNITED STATES CENSUS

recognizes the geographical divisions shown in Fig. 43. Fig. 44 shows the division into natural regions as dealt with in succeeding chapters, and is a modification of the official census map. Many of these natural regions are so big that they might be subdivided, but for our purpose the larger divisions must suffice. On the north the natural regions of the United States are continued in Canada, for the political boundary is artificial throughout most of its length. Nevertheless, the two countries are sufficiently

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distinct in history and sentiment to warrant a regard for the dividing line of their frontier, even though it is the longest open, unarmed frontier in the world. The natural

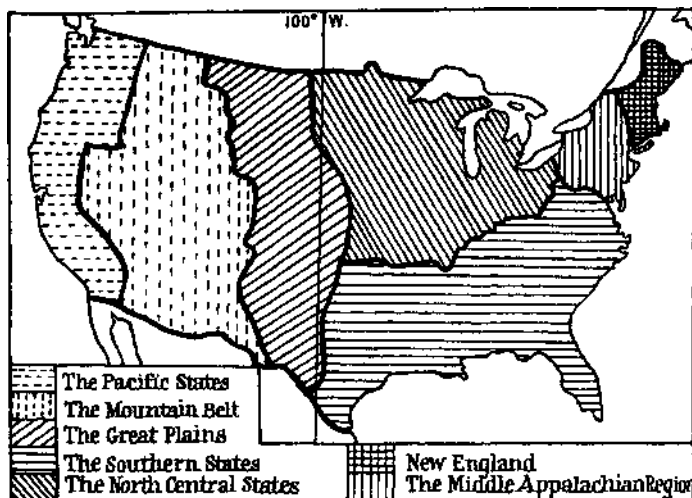


FIG. 44. THE NATURAL REGIONS OF THE UNITED STATES

regions that are most simple in development will be dealt with first, before the study of the more complex development of northern and eastern regions.

THE NEW DEAL

President Franklin D. Roosevelt took office in March 1933, when his country was deep in the trough of a trade depression. Under his inspiring guidance strenuous efforts have been made to restore something of the old prosperity. The programme of Mr Roosevelt's Government is usually known as the New Deal. It seeks to conserve and develop natural resources, to encourage international trade, to provide employment for the workers and some form of maintenance for the unemployed, and to abolish such evils as child labour and sweated labour.

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One of the finest achievements of this national planning is that of the Tennessee Valley Authority. The Norris Dam, near Knoxville, will eliminate the disastrous floods of the Tennessee river, thus preventing the loss of surface soil; it will supply electric power for great industrial and agricultural development in a 'depressed area' almost the size of England. -The President plans to adopt similar schemes in the Ohio Valley and in other regions which are subject to floods, and where soils are being denuded.

EXERCISES

1. Draw a sketch map of one important transcontinental railway of the United States. Discuss its importance in trade.

2. Show in diagrammatic form the values of United States exports and imports (page 171), and of trade according to countries (page 172). Add explanatory notes.

3. On a map showing the boundaries of states indicate the distribution of maize and add a line marking off what you regard as the Maize Belt. Contrast the production in 1930 and 1936.

PRODUCTION OF MAIZE IN THE UNITED STATES (1930, 1936)

STATE	1,000,000 BUSHELS		STATE	1,000,000 BUSHELS	
	1930	1936		1930	1936
Alabama	30	41	New Jersey	7	7
Arkansas	8	27	New York	22	20
Colorado.	37	n	North Carolina	52	43
Georgia .	45	34	North Dakota "	19	3
Illinois .	238	218	1 Ohio	89	122
Indiana .	n o	115	! Oklahoma	36	12
Iowa *	361	212	Pennsylvania .	29	55
Kansas x.	76	n	South Carolina	27	24
Kentucky	31	54	South Dakota ¹	77	8
Louisiana	21	21	Tennessee	41	57
Maryland	21	18	Texas	91	64
Michigan	28	37	Virginia .	18	30
Minnesota '	136	88	West Virginia .	13	12
! Mississippi	20	40	Wisconsin	79	44
i Missouri	173	40	Total for all states .	2081	1524
Nebraska >	236	27			

¹ In recent years farming has suffered in these states through drought and dust storms, especially in 1935-

CHAPTER X

ALASKA AND THE PACIFIC STATES

ALASKA

UNDER a treaty of March 30, 1867, Alaska was purchased from Russia by the United States for 7,200,000 dollars (approximately £1,500,000), and many Americans thought it a bad bargain. But the annual exports from Alaska are now worth nearly ten times the purchase price.

Alaska is nearly five times the size of the British Isles, or one-fifth that of the United States, but its permanent population is only about 60,000, of whites and Indians (including Eskimo) almost equally, increased in the summer months by 20,000 additional workers in mines, canneries, and railway construction. The country is governed jointly by the United States Congress and its own elected assembly.

Alaska, like Scandinavia, lies mainly south of the Arctic Circle. The boundary between Alaska and Canada consists in the north of meridian 141° W., and is continued by a line running south parallel with the coast, to include a multitude of small islands and a 500-mile strip of coast appropriately called the Pan-handle. Thus Alaska cuts off Northern Canada from the Pacific. The coast-line is so much indented, especially along the south, with its numerous fjords, that it exceeds in length that of the United States. The long, narrow Alaska Peninsula is continued by the great loop of the volcanic Aleutian Islands, extending 1500 miles to the Kamchatka Peninsula of Asia.

The physical map reveals Alaska as a mountainous country. Its folded ranges form part of the Western

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Cordillera, and enclose the*deeply dissected Yukon Plateau. The lofty Alaskan Range and St Elias Alps rise abruptly from the Pacific coast, and include the highest peak of North America (Mount McKinley, 20,464 feet). The

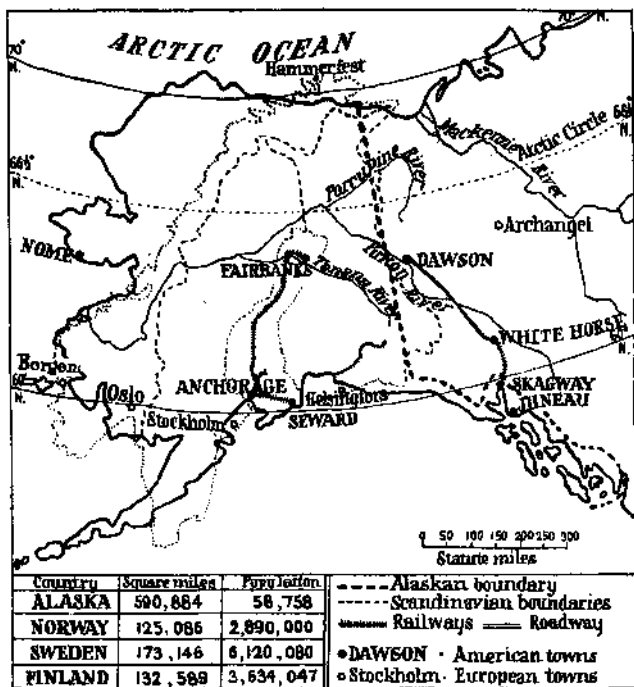


FIG. 45. ALASKA COMPARED WITH SCANDINAVIA AND FINLAND IN LATITUDE AND IN SIZE

After Russell Smith

oceanic winds deposit heavy snowfall on the higher parts, the snow-line being at 2000 feet, and from the snowfields many huge glaciers descend to the fjords, where they break off as icebergs. The lower mountain slopes are sufficiently mild and wet to support splendid forests of spruce, hemlock, and cedar. The interior plateau and

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Arctic shores have a wide range of temperature, the winters being long and severe, while precipitation is light. The more sheltered valleys have forests of spruce, hemlock, poplar, and birch, the higher parts of the plateau being carpeted with mosses. The summer is short but warm.

Before the coming of the European the Indians on the coast lived mainly on fish, especially salmon, and salmon still form the chief wealth of Alaska. Salmon are born in fresh-water streams, and after a few weeks descend to the sea to spend the rest of their lives, returning finally after several years to the stream of their birth, in order to lay their eggs for the next generation of their kind. It is so easy to catch the incoming salmon in big nets placed across the rivers that there has been grave danger of the extermination of the fish.¹ Salmon-fishing is a seasonal industry. In early summer a ship will arrive in the river-mouth, and unload its cargo of tin cans and Chinese packers. During the long summer days there is great activity. The salmon, weighing anything up to forty or fifty pounds, are scooped out of the river, cut up and put into cans by Chinamen, and finally sealed up and cooked. At the end of the summer the ship returns to Seattle or San Francisco laden with canned salmon for dispatch to all parts of the world. There are 156 salmon canneries in Alaska, employing over 22,000 workers.

The sea yields another rich harvest, in the form of seal-skins, from the Pribilof Islands, on the Bering Sea. These fur-seal herds, comprising 85 per cent, of the world's fur-seals, are United States Government property. Only the surplus young males are killed, so that the herds are preserved from the extinction that once threatened them.² The coastal waters of Alaska also have great resources in herring, cod, halibut, and other fish, but remoteness from

¹ Since 1922 there has been some restriction on the number of salmon caught in Alaskan waters.

² The number of seals was reduced by slaughter from 2,000,000 in 1873 to 127,000 in 1911. In 1935 there were 1,550,913.

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great centres of population has discouraged great-scale fishing.

Minerals rank next to salmon as a source of wealth. Alaska has a great variety of minerals, of which the most valuable in output are gold, copper, and silver. Relatively small quantities of tin, lead, and coal are produced, and there are supplies of petroleum, marble, gypsum (for making plaster of Paris), mercury, and platinum. In recent years the value of mineral output has been about one-third of the maximum figure reached in 1916. The Klondike gold rush of 1897-98 brought an influx of miners to the Yukon Valley. Tens of thousands set out to penetrate an unknown, mountainous country, and many perished from the severe cold, or starved to death when their supplies ran out.

Staggering under a great burden of flour and bacon, beans and blankets, tent, axe, pick, frying-pan and rifle, the prospector toils on, hunting, digging, hunting, digging. As the days pass the scanty food-supply diminishes and must be eked out with berries and game; then back he goes for more supplies and out again for more digging. Such is the life of the Alaska prospector.¹

The gold that could be obtained by washing gravel from the streams in a small pan was soon worked out. Then came placer-mining—that is, washing down the gravel banks by powerful jets of water. The output of placer gold has declined, and most gold is obtained by crushing with machinery the ores found at several places near the coast. The chief mineral wealth occurs in the mountain ranges and the coastal belt of Southern Alaska. There are enormous stores of coal, but its inferior quality and transport difficulties make it unimportant.

The hemlock, spruce, and cedar forests of Southern Alaska provide another resource. There is already a considerable sawmill industry, and the development of

¹ *North America*, by Professor J. Russell Smith.

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big industries in pulp and paper is only a matter of time. The possibilities of agriculture in the valleys are being demonstrated by Government experimental stations, but the most promising farming developments depend on the natural pastures. Destruction of the animals upon which their livelihood depended threatened the Eskimos with

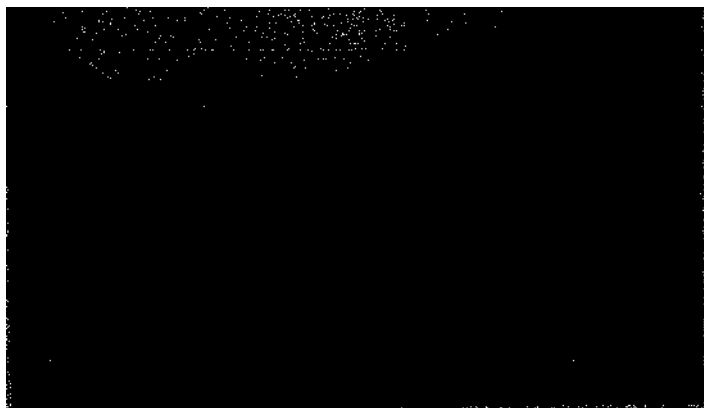


FIG. 46. JUNEAU, CAPITAL OF ALASKA

The site of the town reveals the scarcity of lowland on this deeply indented coast. Juneau is at the head of a splendid fjord harbour.

By courtesy of the Canadian Pacific Railway

starvation; so the United States Government about forty years ago introduced 1280 reindeer from Siberia, together with Siberians and Lapps to teach the Indians how to become reindeer shepherds. The industry has prospered, for by 1930 the number of reindeer had increased to 600,000, and reindeer meat is exported to Seattle and other western cities.

Alaska has no large towns. Juneau (4000) is the capital; Nome (1200), the port of the Seward Peninsula, has an open roadstead from which passengers and goods are

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landed in lighters. Besides the railway already mentioned, there are two other lines from southern ports, the more important being that from Seward (800) to Fairbanks (2100), in the heart of the country, a distance of 467 miles.

THE PACIFIC STATES

The Pacific States of Washington, Oregon, and California include the Pacific Slope—that is, the land drained to the Pacific Ocean. The broken Coast Ranges are separated from the Cascades and Sierra Nevada by two longitudinal valleys, and beyond the mountains lie the cordilleran plateaux. Climatically Washington and Oregon are of West European type, and California of Mediterranean type, but there are great differences between the exposed coastal belt, the sheltered valleys, and the lofty mountain areas throughout the three states. The coastal belt has mild temperatures, owing to the influence of the Pacific, while the summers of the Californian coast are greatly cooled by the California Current, which also causes frequent fogs. The valleys have warmer summers and cooler winters than the coastal belt. Throughout the region most rain comes in the winter half of the year, and is heaviest on the mountains, which are therefore forested, the sheltered valleys being so much drier that irrigation is commonly necessary, and dry-farming frequently practised. Dry-farming (first practised in Utah in 1875) is adopted in many arid regions. The land is deeply ploughed to break up the subsoil, which is then closely packed together by a special machine. The surface soil is finely broken up with a harrow, a process that is repeated after every fall of rain so long as possible without injury to the growing crops, whose seeds have been drilled into the subsoil. In this way any moisture that falls is allowed to penetrate at once to the subsoil, which stores it with little loss by evaporation. Dry-farming is widely practised in the drier parts of the United States, especially in the

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FIG. 47. THE PACIFIC AND CORDILLERAN PLATEAUX STATES

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Great Basin, Columbia Valley, Great Valley of California, and parts of the Great Plains. Special drought-resisting varieties of wheat are grown in these regions.

In Washington and Oregon the prevailing winds are the south-westerlies, which affect California only in the winter half of the year. The annual rainfall varies from over 100 inches in Northern Washington to less than 10 inches in the south of the Californian Valley and parts of the Columbia Basin.

Washington and Oregon.¹ Both states have immense natural resources capable of supporting a very much greater population. The well-watered longitudinal valley enclosing Puget Sound in the north (Washington) and the Willamette Valley in the south (Oregon) is a region of wonderful fertility, for it is an old arm of the sea filled with sediments from the surrounding mountains. The Willamette Valley was the goal of the pioneer settlers who journeyed along the lengthy Oregon trail. Farming is the most important occupation in both states. Of the grain crops wheat ranks first, and large quantities of barley, oats, and rye are grown, while fruits—plums, apples, pears, peaches, cherries, loganberries, etc.—and potatoes are also important. The export of canned and dried fruits is increasing. The pastures support sheep (providing a big wool clip), dairy and other cattle, and horses, the chief stock-raising being carried on in the drier lands east of the Cascades, where the pastures of the Columbia Basin produce meat, wool, and hides.

The Columbia river breaks through the Coast Range in a narrow gorge, and has also cut a gap through the Cascade Mountc The latter route gives easy access to the Columbia . sin, and will one day carry a big traffic by river and railway. The Columbia Basin is nearly all part of a great lava plateau, which has weathered into deep, rich soils, with a remarkable capacity for retaining mois-

¹ Washington, 69,127 square miles, 1,563,396 people; Oregon, 96,699 square miles, 953,786 people.

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ture. Hence, despite low rainfall, winter wheat¹ is grown in many parts, the yield per acre being very great. At the eastern foot of the Cascades there are extensive irrigated lands, largely devoted to apple orchards, and Washington is the leading apple-growing state. Spokane (115,000), the largest city of the Columbia Basin, is the centre of a region rich in wheat, animal produce, timber, and minerals. Electric power from the Spokane River Falls is used in flour-milling, and the town is also a railway centre.

Timber is a valuable product in Washington and Oregon, which are the chief lumber states, and ship large quantities of timber to the eastern states. Minerals are also important. Washington has a valuable coalfield, and both states produce copper, gold, silver, and other minerals.

The coastal waters provide halibut and oysters, but the fresh-water fisheries of the Columbia river are more important. The chief fish are salmon, which are canned in large numbers, and sturgeon. The latter is the largest fresh-water fish of the Northern Hemisphere. The flesh is excellent eating; the roe provides the delicacy of caviare; and isinglass² is prepared from the air-bladder.

Seattle (366,000), standing on a splendid natural harbour on the shores of Puget Sound, handles an extensive trade from its hinterland in timber, fruit, grain, and wool. As the nearest United States port to Alaska, Seattle carries on the bulk of Alaskan trade, while shorter routes to the Far East enable it to rival San Francisco as the port for silk and other Asiatic produce. Seattle is a naval station, and has shipbuilding, flour-milling, and fruit- and salmon-canning industries.

Tacoma (107,000), also on Puget Sound, is the second port of Washington, with an immense timber export.

¹ *I.e.*, wheat sown in autumn.

² Isinglass is a pure form of gelatine. Its chief use is for clarifying wines, beers, and other liquids. It is also used in jellies, jams, glues, and plasters.

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Portland (302,000), the chief city of Oregon, stands on the Willamette, near its junction with the Columbia, 120 miles from the sea, and exports timber, salmon, grain, and fruit. Astoria (10,000) is a salmon-canning port at the mouth of the Columbia.

California. California is almost as big as Washington and Oregon combined. The south-east of California includes the Mohave Desert and Death Valley, the latter a



FIG. 4b. JOSHUA-TREES IN THE MOHAVE DESERT, CALIFORNIA

By courtesy of the Los Angeles Chamber of Commerce

desolate, waterless, salt-encrusted plain below sea-level. The valley got its name through a party of emigrants losing their lives there in 1850. Death Valley is now a winter resort, reached by railway and motor-car, and possessing a modern hotel.

The most important parts of California are the Great Valley and the coastal belt in the south. In these regions live almost the whole population of 5,677,000, which includes over 97,000 Japanese, 81,000 negroes, 37,000 Chinese, and 19,000 Indians. The Sierra Nevada is important in its influences on the Great Valley. From it the Sacramento and San Joaquin rivers and their tributaries

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have brought down the fertile soils of the valley floor. Their old rocks contain gold, copper, silver, mercury, zinc, and lead. The gold rush of 1848-49 led to the first big influx of population. As in Alaska, the early miners obtained their gold by shaking the river gravels in a pan of water. Great dredger machines are now used in the

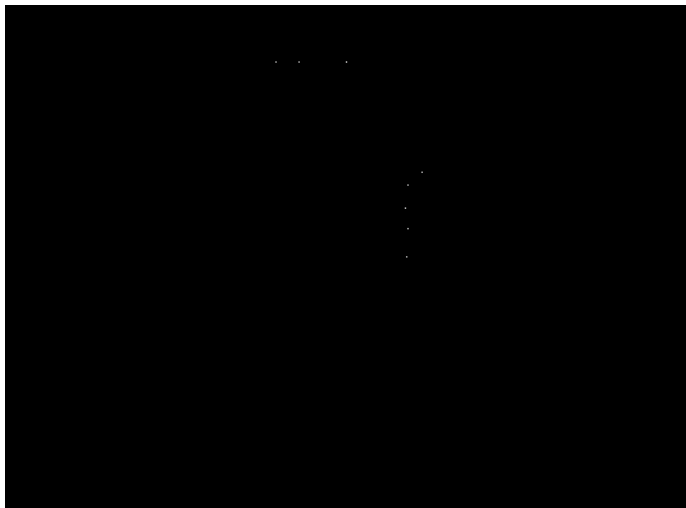


FIG. 49. THE FALLS, YOSEMITE NATIONAL PARK, CALIFORNIA

The Upper Falls have a sheer drop of 1430 feet, followed by a series of cascades, then a drop of 320 feet in the Lower Falls, the total drop being 2370 feet. The Yosemite Valley, cut through granite by water and glacial erosion, is eight miles long, half a mile to a mile wide, and 2000-6000 feet deep.

By courtesy of the Canadian Pacific Railway

river-beds, but most gold is obtained by sinking shafts and making tunnels along the gold-bearing veins. The ores thus extracted are crushed in powerful machines to obtain the gold.

The Sierras shut out the cold winds of the interior; without such a barrier fruit-growing would be impossible. Above all, the Sierras provide the water, without which

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the valley would be a wilderness, from the heavy rains and snows of winter. Dams are being made to hold up enough water for irrigation throughout the summer. Water-power, another gift of the Sierras, supplies electricity for the agricultural work of the Great Valley and light and power for the cities of the coastal belt. Finally, the magnificent scenery, which includes the highest mountain of the United States (Mount Whitney, 14,501 feet), the forests of majestic trees, and the Yosemite and other *canons* afford health and inspiration to the holiday-maker.

Sixty years after the discovery of gold oil was found in such quantities that the ever-increasing number of wells quickly made California a leading oil state. Oil-refining in the coastal cities is the chief manufacturing industry of California. Gold and petroleum have brought great wealth, but their supplies will one day be exhausted. The permanent prosperity of California depends mainly on its farming industries. The Spanish settlers were cattle-ranchers, and cattle-ranching remained a leading occupation until late on in the nineteenth century, the chief cultivated crops in those days being wheat and barley.

The great products to-day are fruits and vegetables, grown in the Great Valley, 500 miles long, twenty to fifty miles wide, and about one-third the size of England in area. The Great Valley is covered with fertile alluvial soil. Hot, dry summers, with abundant sunshine and exceptionally mild winters, with light rainfall to supplement irrigation from the rivers, and from artesian wells sunk into the valley floor, have combined to make the Great Valley the world's finest fruit region, and a great exporter of fruits and vegetables. For a long period the trade of California suffered through remoteness from good markets, and the chief exports were hides, gold, wool, and wheat. By specializing on one product in each district—peaches in one, prunes in another, melons in a third, and so on—and by supplying the fruit to huge co-operative

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associations, the fruit-growers have built up a gigantic industry. Several varieties of grapes are grown, the best known being those that have achieved a huge world-wide sale as "Sun Maid Raisins," largely as the result of good advertising by the Raisin Growers Association. Oranges



FIG. 50. SECTION OF SIGNAL HILL OIL-FIELD, CALIFORNIA
, A multitude of unsightly derricks disfigure the landscape. Note the storage tanks.
By courtesy of the Los Angeles Chamber of Commerce

(the "Sunkist" brand are famous), lemons, apples, pears, figs, peaches, apricots, plums, prunes, cherries, strawberries, tomatoes, olives, almonds, and walnuts are other important fruits of this wonderful valley, or of the smaller valleys of the Coast Ranges, where the climate is cooler and wetter. There are also great crops of celery, asparagus, spinach, beans, peas, potatoes, sugar-beet, and other vegetables. The bulk of the fruit and vegetable crops is

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exported, fresh, dried, or canned. The acres and acres of prunes, raisins, peaches, and other fruits laid out on trays to dry in the sunshine make an imposing sight. The Del Monte firm alone has an enormous sale of canned fruits and vegetables in most parts of the world. The vegetable-growing is mainly in the hands of Japanese, Hindus, Mexicans, and other foreigners. The demand for addi-

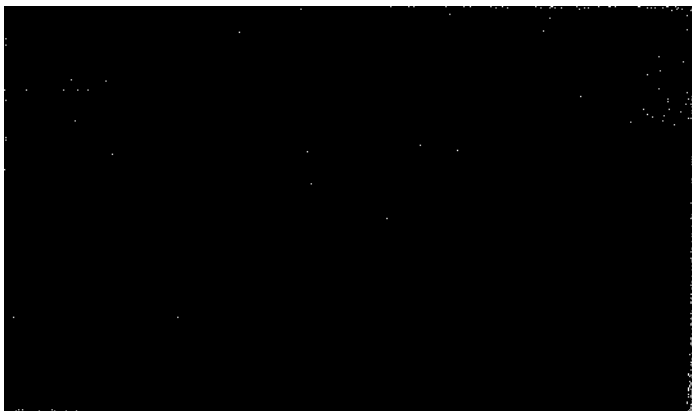


FIG. 51. LOADING AN OIL-TANKER, LOS ANGELES HARBOUR

By courtesy of the Los Angeles Chamber of Commerce

tional labour during the harvest season is met by the employment of the floating population of unskilled labourers—Red Indians, Mexicans, Chinese, Japanese, and any others willing to work hard.

Of the valleys of the Coast Ranges that of Santa Clara is the most important.

San Jose, the centre of the Santa Clara Valley, is one of the leading fruit cities of the world. Its canneries, dryers, and packing-plants have developed to such an extent that carloads of peaches and other fruit are hauled to San Jose from points as much as 200 miles distant. At the unloading platforms trucks and trains are disgorging thousands of boxes of fresh fruit. It is rolled into the factory door in

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quantities that seem truly appalling. Hundreds of men and women are busy paring, skinning, scalding, and packing.¹

San Francisco (634,000) is the gateway of the Californian Valley. Its harbour, entered through the Golden Gate, is one of the finest in the world, and it gains added importance from the absence of good harbours along most of the western coast of the United States. Flour-milling, woollen-manufacturing, and fruit-canning are important industries, while sugar-refining (dependent on sugar from Hawaii) and shipbuilding are noteworthy. San Francisco is the focus of many important routes. It is the terminus of several transcontinental railways, and has shipping connexions with nearly all parts of the world. The Panama Canal has increased its trade with Atlantic ports. From the ashes of the old city destroyed by earthquake and fire in 1906 there arose with great rapidity a new city, more imposing than the old. Its coastal position gives the city a summer like that of Western England, making it a welcome resort for the peoples of the Great Valley, where the summer heat is almost unbearable. Round the bay there are other towns, the most important being Oakland (284,000), the terminus of the Southern Pacific Railway. A great new bridge crosses the Golden Gate, and another links San Francisco with Oakland. Water-supply and hydro-electric power are secured from the distant Sierra Nevada, petroleum is at hand, but coal must be imported. Sacramento (94,000), the state capital, stands in the middle of the Great Valley.

Southern California is almost wholly desert and semi-desert, but round Los Angeles there is sufficient winter rainfall for certain plants, although irrigation by ditches, wells, and pumps is the mainstay of most crops. In the late eighteenth century the Spaniards established mission settlements, and the friars introduced Mediterranean products—vines, oranges, lemons, olives, cork-oaks, wheat, and barley, besides keeping cattle, horses, donkeys, and

¹ *North America*, by Professor J. Russell Smith.

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sheep. Since it became part of the United States the region has developed very rapidly. Its climate, one of the most delightful in the world, and its varied and beautiful scenery, attract thousands of settlers, many of whom have retired from working life, tourists, and health-seekers.

Cultivation is very intensive—big quantities of produce

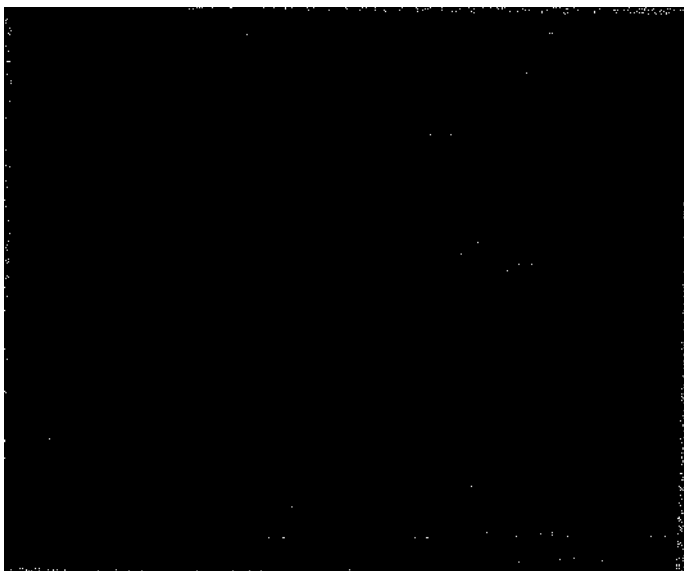


FIG. 52. A DATE ORCHARD IN SOUTHERN CALIFORNIA

By courtesy of the Los Angeles Chamber of Commerce

are obtained from relatively small areas. Oranges and lemons are the principal fruits exported, and the climatic conditions vary so much with height and situation that grapes, peaches, apples, celery, sugar-beet, and alfalfa are also important crops.

The petroleum that has brought so much wealth and cheap power is mainly obtained in Southern California, within easy reach of the ocean, to which the oil can be

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carried in pipe-lines. Petroleum and hydro-electric power are particularly valuable in the absence of coal.

The dry, sunny climate, clear atmosphere, and varied scenery—coast, desert, plain, mountain, village, city, etc.—have made Southern California the greatest film centre in the world. Hollywood is the headquarters of an industry that sends its products to all parts of the world. Film-making is one of the leading industries of the United States. It has been estimated that the weekly attendance at cinemas throughout the world is 250,000,000, of which the United States alone claim 115,000,000; and in the British Ehipire about 90 per cent, of all films shown are American.

Los Angeles (1,238,000) has grown with amazing rapidity into one of the biggest cities in the United States—fifth in population, and with an area half as big again as that of New York. Its artificial harbour is a port of call for many shipping lines, and handles a good deal of trade from Western Mexico, as well as from its own hinterland. Los Angeles is the greatest tourist centre of the United States. Meat- and fruit-packing are important, while Hollywood, with its film production, is a suburb of the great city. Water is brought to Los Angeles through mountain tunnels, and across the plains from Owen Lake, on the east of the Sierra Nevada, by an aqueduct of 240 miles, the longest in the world.

EXERCISES

1. Compare Alaska with Scandinavia, indicating its probable lines of future development.

2. Draw sketch maps to show the position and importance of (a) Seattle and Tacoma, (b) Portland (Oreg.), (c) San Francisco, (d) Los Angeles. Add brief notes on any important points not revealed in the maps.

3. Write brief accounts, illustrated by simple maps, of (a) the Columbia Basin, (b) the Great Valley of California. Compare the latter with the Central Valley of Chile.

CHAPTER XI

THE MOUNTAIN BELT AND THE GREAT PLAINS

THE PLATEAUX

BETWEEN the developing lands of the Pacific coast and the eastern half of the United States, with its immense industries and big cities, there extends a great barrier of lofty ranges and broad, high plateaux, dry in climate, thinly peopled, and devoted in the main to animal-rearing and mining. The mountain belt is so formidable a barrier that railway transport is costly, and most of the trade between the eastern and western States is carried on *via* the Panama Canal. The plateaux will be described in the following order: (1) the Snake River Plateau; (2) the Great Basin; (3) the Colorado Basin.

1. *The Snake River Plateau.* The Snake river is a long tributary of the Columbia, the greater part of its course running through Southern Idaho, or forming the boundary between that state and Oregon. The Snake has cut deeply into the great plateau built up by successive flows of lava and layers of volcanic dust, with occasional layers of sand and mud that mark the sites of old lake bottoms. The great gorge, over one hundred miles long, and 4000 to 6000 feet deep, rivals the Grand Canon of the Colorado river. Much of the basalt of the plateau has weathered into fertile soil, but there are also extensive areas of hard volcanic rock and stretches of dry volcanic dust and ash. In the Snake River Valley there is a little agriculture dependent on irrigation, but the chief industry is the breeding of livestock (especially sheep), which find abundant food on the sage-brush plains and mountain pastures in summer, and in winter are fed on alfalfa in the valley.

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All the farms use the abundant and cheap electric power furnished by the mountain streams. Meat, wool, beet-sugar, and dairy produce are the chief products that pay for transport to the distant markets of the eastern states.

2. *The Great Basin.* The Great Basin is an extensive plateau lying between the Sierra Nevada and the Wasatch Mountains* It includes the whole of Nevada* and the western half of Utah. The plateau is crossed by many ranges of old block mountains, between which the valleys or basins have been filled to a great depth with rock-waste washed down by rivers. The basins are areas of inland, or continental, drainage: the rivers have no outlet to the sea, but end in lakes made shallow with river-borne mud. As only the pure water evaporates, the mineral matter brought in by the streams collects in the lakes in ever-increasing quantities, and there are huge deposits of common salt, soda, and other minerals. The Great Salt Lake of Utah is the remnant of a fresh-water lake¹—about as big as the present Lake Huron—that existed during the heavy rains of the Ice Age, and drained out to the Snake river. At that time the lake was 1500 feet deep, but the present rainfall is so much less that the lake has dwindled in size, nowhere exceeding fifty feet in depth, while the average is from fifteen to eighteen feet. Wave-cut caverns, cliffs, and beaches mark the former levels of the lake on the surrounding mountains. Large areas of the old lake bed are encrusted with salt, and the lake contains 400,000,000 tons of common salt, besides other minerals.

In two such mountainous states as Nevada and Utah mining is naturally important. Indeed, Nevada, the most thinly peopled state² in the Union, was until recently dependent entirely on mining, and its population fluctuated

¹ This former lake is known as Lake Bonneville. On the salt flats in 1937 Captain G. E. T. Eyston broke the world's motor-car speed record.

² The population at the 1930 census was only 91,058—less than one per square mile.

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greatly as mines were worked out or new deposits discovered. Mining towns that sprang into being in the feverish rush for gold and silver decayed just as rapidly when the mines were exhausted. The mineral wealth of Western Utah has been developed later, and the production is much greater than that of Nevada. The chief minerals of the Great Basin are silver, gold, copper, lead, iron, gypsum, salt, sulphur, and zinc, while the coal deposits of Eastern Utah, beyond the Wasatch Mountains, are important for smelting-works.

The seasonal range of temperature on the Great Basin is great; days of blazing heat may be followed by cool or cold nights, and the rainfall is scanty, except on the highest mountains. The plains are treeless, bunch-grass and sage-brush forming the typical plant life, and only on the higher ranges are there scattered forests. A scanty population is inevitable. Mining will long remain important, but permanent settlement must depend on farming, supported by irrigation.

In 1847 the Mormons, or Latter-day Saints, an American religious sect founded by Joseph Smith in 1830, settled on the shores of the Great Salt Lake, whither they had journeyed over plains and mountains to escape persecution. With praiseworthy industry the Mormons set to work to transform the desert into a land of farms yielding heavy crops of grain, fruit, and vegetables. They diverted the mountain streams to the plains round the lake—the first important irrigation works in the United States. The level nature of the various basins of the plateau and the fertility of their soils make them ideal for irrigation, but water is available in sufficient quantities only along the foot of the Sierra Nevada, in Nevada, and the Wasatch Mountains, in Utah. The United States Reclamation Service has carried out irrigation schemes in both regions, the greatest in Utah being that of the Strawberry River Valley. The principal crops are wheat, oats, barley, and potatoes, with alfalfa as a fodder crop.

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Dairy and other cattle, sheep—providing a valuable wool clip—and horses are kept in considerable numbers. Dry-farming is practised on suitable soils in Utah, wheat being the chief crop.

Salt Lake City (140,000), founded on the river Jordan by the Mormons, is the largest city between the Rockies and the Pacific ports. Strikingly situated a few miles from the Great Salt Lake, and backed by the Wasatch Mountains, the city is the collecting and distributing centre of the farming and mining industries, besides being the headquarters "of the Mormon Church¹ and capital of the state of Utah. Ogden (40,000), lying north of Salt Lake City, is an important centre on the Union Pacific Railway. One line from Ogden goes due west over the Salt Lake by means of a long bridge.

In Nevada the railway follows the westward-flowing Humboldt river, the longest in the Great Basin, along the route of the 'Forty-niners/ The Humboldt, often little but a series of connected water-holes, ends in the salt Lake Humboldt.

3. *The Colorado Basin.* South of the Great Basin there are several plateaux forming a region even drier and hotter than the Great Basin.

Everywhere the rain is so slight, the summer so hot, that the farmer with his plough is not the symbol of the settlement. Instead it is the cowboy with his lariat and leather leggings that keep the cactus from pricking him.²

Agriculture is unimportant, since irrigation is only possible in scattered areas. Large ranches, where cattle roam over big areas for the scanty pasture, are the outstanding characteristic of most of the region. Drought occasionally causes heavy losses among the herds.

Most of the Colorado Basin is a plateau over 6000 feet

¹ Over 60 per cent, of the population of Utah are members of the Mormon Church.

² *North America*, by Professor J. Russell Smith.

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above sea-level, lying between the Rockies and Wasatch Mountains, and formed of almost horizontal sedimentary rocks, with a region of volcanic cones and lava flows in the south. The rocks have been fractured a great deal, and huge plateau blocks have been lifted up to various heights. The rivers, fed by rains and melted snows, have carved out deep *canons*, of which the most remarkable is the Grand Canon of the Colorado river itself.

Even the least imposing portions of the canon are as impressive as any scenery that can be found in the world.

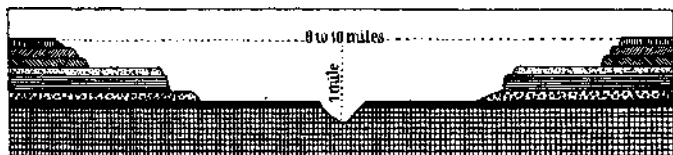


FIG. 53. DIAGRAMMATIC SECTION THROUGH THE STRATA OF THE GRAND CANON, COLORADO

Canyon development is favoured by (a) great altitude (hence swift streams); (b) arid climate (hence little lateral erosion); (c) strong streams; (d) rocks that will stand with steep slopes.

For 200 miles of the river-bed, with a breadth of ten to twelve miles or more, is here revealed the interior of the workshop of nature and the secrets of the building up of our earth's crust. . . . To a depth of 6000 to 8000 feet geological history is exhibited in precipitous walls with a clearness unparalleled in any portion of the world, telling of æons of rock-building and millenniums of rock-carving by wind and water. Far below, hardly recognizable, if at all visible from above, flows the great river, which in its ceaseless rush has carried to the sea the sands and *debris*—results of the denudations of more recent formations; has cut through the pale grey limestones of the Permian, the pink and brilliant red sandstones and the purplish and vermilion limestones of the Triassic, the deep-brown rocks of the Carboniferous, down to the sombre, iron-black granites of the Silurian and Archaean ages.¹

¹ B. E. Fernow, in the *National Geographic Magazine* (1897).

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The diagram (Fig. 53) reveals the manner in which the softer strata have been worn into gentle slopes, while the harder rocks form steep, projecting cliffs. The reason for the Spanish name 'Colorado' (coloured) is clear from the above description of the Grand Canon. The dissection of the big plateaux by *canons* has resulted in the formation of separate flat-topped mountains of irregular outline, known as *mesas* (Spanish for 'tables'), the smaller ones being called *buttes*.

On the highest mountains and *mesas* there is sufficient

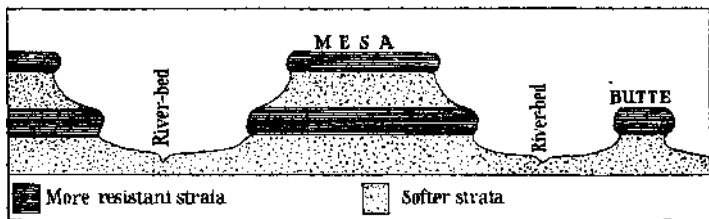


FIG. 54. SECTION TO SHOW THE FORMATION OF MESAS AND BUTTES

rainfall for forests of yellow pine and cedar, with good pasturage for cattle, sheep, and goats in the clearings. The Pueblo Indians (see pages 79-80) make their homes on the tops of *mesas*. There are many Indians in reservations, the Hopi dwelling in the old fortress-homes on *mesas*, and the Navajos leading a nomadic life with sheep, horses, mules, and *burros* (donkeys).

The Colorado Basin includes Eastern Utah and parts of New Mexico, Arizona, and Nevada. This country of *canons* is so difficult to traverse that it is one of the least-known parts of the United States, and is avoided by the railways. There is little mineral wealth, and the chief resources are likely to remain grazing animals and the pine-forests of the mountains.

The Arizona Highlands, immediately south of the Colorado Plateau, are a copper-mining country. Still

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farther south, and also westward, lies the great desert of the United States, where the land is lower, hotter, and drier. The desert goes under various names: Mohave Desert, Death Valley, Colorado Desert, and Arizona Desert. The desert is a region of cactus, sage-brush, and low thorny bushes, with some areas devoid of plants, and here and there isolated mountains weathered by sun, frost, wind, and the rare rainstorms into weird and fantastic shapes. The rain carpets the earth with grasses and flowers, which rapidly bloom, wither away, and leave their seeds ready for the next shower. Old lake-beds contain great stores of salt, potash, and borax.

The waters of the Colorado and its big tributary the Gila were used centuries ago by the Indians for irrigation in the desert. Since 1902^x important modern irrigation works have been undertaken. The Roosevelt Dam on the Salt river, a tributary of the Gila, holds up water for irrigation in the valley below, and also furnishes electric power. The mighty Boulder Dam, on the Colorado river in Nevada, constructed for the same purposes, is the largest in the world. Alfalfa, fruits, vegetables, and dairy produce are typical of the irrigated area. The states of the Colorado Basin have entered into an agreement for the building of similar dams in the Grand Canon and other sections of the Colorado river. The Lower Colorado may thus become a new Nile, turning the desert into a vast oasis.

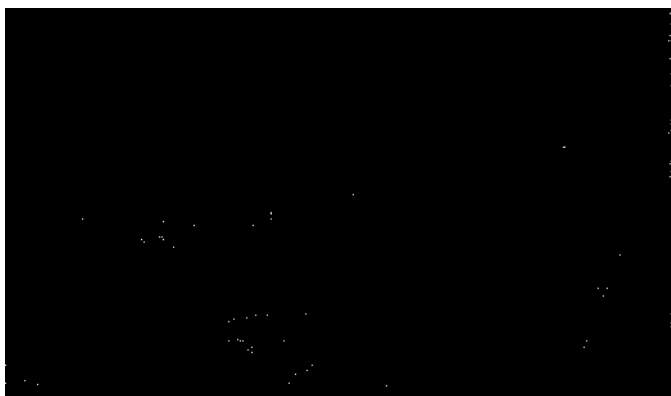
THE ROCKIES

The Rockies resemble the Alps in their bare, sharply chiselled peaks, and snow-clad summits. There are small glaciers in many high valleys, and beautiful glacial lakes in the lower valleys. Above the forests there are the splendid summer pastures that one associates with the

¹The date of the Reclamation Act, which authorized many irrigation schemes.

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Alps, but in the drier valleys there may be sage-brush or cactus. In the more fertile valleys alfalfa, potatoes, wheat, barley, and fruit are grown, while the animals provide butter, cheese, hides, and wool; but as yet farming is relatively unimportant. Timber from the forests is often



TIG. 55. TYPICAL PLATEAU SCENERY ON THE BORDERS OF ARIZONA AND NEW MEXICO

This air photograph, taken in 1929 by Colonel Charles Lindbergh, affords excellent illustrations of *canyon*, *mesa*, and *butte* formations. Travel in such country is difficult, except by air.

By courtesy of the Carnegie Institution of Washington, and Wide World Photos

rather inaccessible, much of it is only fit for wood-pulp, and large areas have been devastated by forest-fires. The magnificent scenery of the Rockies attracts thousands of tourists and campers, especially to the national parks.

The gold that first attracted men to the Rockies is nearly all worked out, as many abandoned mines, shacks, and even towns bear witness. Huge deposits of lead and silver in Utah, and of copper at Butte, Montana, have been

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of greater and more lasting value, while great supplies of coal, oil-shale,¹ and phosphate still remain. Phosphate is a fertilizer, and the Rockies contain the greatest deposits in the world.

El Paso (102,000)—'The Pass'—on the Rio Grande del Norte, is the meeting-place of eight railways and an im-



FIG. 56. A GOLD-MINE IN SOUTH-WESTERN COLORADO

Note the mine refuse on the left, the mill for ore-crushing, the conifers, and the bare mountain peak. The whole scene is typical of the western mountains.

By courtesy of the Colorado Association

portant centre for the minerals of New Mexico and the Mexican mountains. The Reclamation Service has built the Elephant Butte Dam, 125 miles above El Paso, holding up the biggest artificial lake in the world, supplying irrigation water in New Mexico and Texas for wheat, alfalfa, and cotton.

¹ *I.e.*, shale containing mineral oil that can be distilled, like petroleum.

MOUNTAIN BELT AND GREAT PLAINS

THE GREAT PLAINS

On their eastern flank the Rockies drop steeply to the Great Plains, an undulating land extending 1500 miles from north to south (including the Canadian section), and from 300 to 500 miles from west to east, where it adjoins the true prairies. As the whole region rises from about 1200 almost to 5000 feet, it is really a plateau, but the descent eastward to the Mississippi Basin is so gradual that it is difficult to say where plain ends and plateau begins. The eastern limit of the Great Plains is approximately the meridian of 100° W., which roughly marks also the annual isohyet (or rainfall line) of 20 inches. The Great Plains, sheltered by the Rockies, have a rainfall of 10 to 20 inches, a quantity insufficient for wheat and maize, especially in view of the wide variations in different years, some being much wetter than the average, others disastrously dry. Most rain falls in summer, while in winter fierce, blinding blizzards may sweep the land. Most of the rivers have cut deep gorges through the soft upper strata, making travel very difficult. The worst type of such a region is the 'Bad Lands'¹ of South Dakota and adjoining parts of Wyoming and Nebraska. Here the land is composed of heavy clay, which holds so little water that it is bare of vegetation. Consequently the rivers, and streams that flow only after rain, have cut deep gullies, and carved the landscape into ugly, fantastic shapes. North of the 'Bad Lands' the pine-clad Black Hills have been pushed up by volcanic action above the surrounding plain. The most southerly part of the Great Plains, in North-western Texas, and extending into Oklahoma and New Mexico, is the Staked Plain, a remarkably level plateau, with an irregular scarp on the south-east.

The Great Plains are grasslands, the climate being too

¹ The old French *voyageurs* called them "les mauvaises terres pour traverser."

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dry for trees. The grasses are sparse but nourishing, and afford excellent pasture so long as the animals are not too numerous. When the Union Pacific Railroad was being constructed the Sioux and other tribes were still getting their meat and skins for clothing and tents by hunting the bison that roamed in millions over the Great Plains, making their annual migration into Canada (Alberta) in spring, and returning south into Oklahoma and Texas in autumn. The Union Pacific Railway was completed in 1869, and in the four years 1868-72 the bison were slaughtered in millions, their place was taken by European cattle, and to-day the Great Plains are the chief cattle-ranching belt of the United States. The Great Plains became the land of the cowboy, immortalized and idealized in stories and films. Most people have revelled in accounts of the wild, free life, with all its excitements—fights with Indians, hunting bison, stage-coach hold-ups, prairie fires. We know of the cowboy's brilliant horsemanship; we have seen him breaking in the bucking broncos, or travelling sixty to eighty miles a day in rounding up the cattle, for the branding of calves in early summer, or the selection of beasts for killing in autumn. Millions of cattle are now sent eastward to be fattened in the Maize Belt, before being slaughtered in such centres as Kansas City, Omaha, and Chicago.

In the eastern, and so wetter, part of the Great Plains, besides stock-rearing, there is a great deal of agriculture, producing wheat, barley, oats, rye, and a little maize. The driest sections, mainly in the west, or on sandy soils, support immense numbers of sheep, which need less pasture and water than cattle. Attempts to establish agriculture in areas of uncertain rainfall have occasionally ruined thousands of settlers, and stock-raising remains the chief industry, except in low-lying valleys, where agriculture is carried on by irrigation. Only permanent rivers from the springs and snows of the Rockies can be used, and so much water is drawn off the Arkansas and

MOUNTAIN BELT AND GREAT PLAINS

South Platte that they are dry for part of the year, only the Missouri and North Platte continuing to flow. The chief crops on the irrigated land are wheat, maize, sugar-beet or potatoes, and alfalfa, grown in rotation, the alfalfa and maize helping to support dairy cattle.

The mineral wealth of the Great Plains has not been

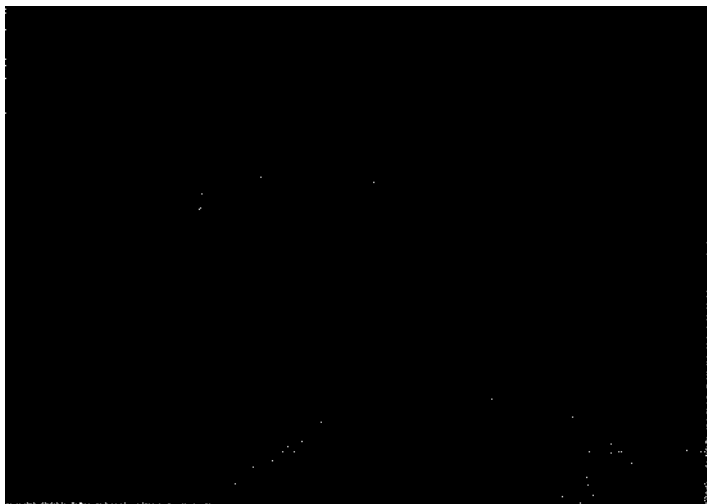


FIG. 57. AERIAL VIEW OF THE STOCK YARDS, DENVER, COLORADO

Note the packing-sheds of Messrs Armour and Company. Near the centre there is a new sheep market, and to the left of it the hog market. The animal pens are in the foreground.

By courtesy of the Colorado Association

exploited to any great degree. Petroleum is obtained in Wyoming, but the coal of Colorado,¹ Wyoming, and Montana is of greater value, while enormous deposits of gypsum and salt are found in the Pan-handle of Texas.

The chief towns of the Great Plains are in Colorado, and Denver (234,000) is the only one of any size. It stands on Cherry Creek, a tributary of the South Platte, a few miles

¹ See the illustration of the Colstrip Jiine, page 206.

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from the base of the Rockies, and is a great mining centre, to which ores are brought for smelting and the manufacture of mining machinery. Denver is also a great distributing centre, furnishing the miners and ranchers with manufactured goods and food-supplies, and having great

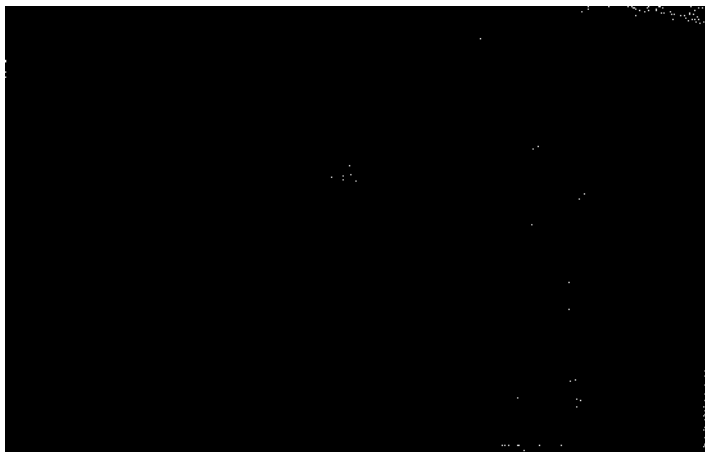


FIG. 58. THE COLSTRIP COALFIELD, SOUTH-EAST MONTANA

The largest open-pit coalfield in the world, with millions of tons within forty feet of the surface. The stripping shovel on the right (over 1000 tons in weight) digs out fifteen tons of earth, swings round, and dumps it on the heap, 300 feet away. The nearer machine is a loader, whose shovel digs nine tons of coal from the seam (twenty-eight feet thick) and quickly fills the railway wagons drawn by an electric locomotive. These gigantic machines are each electrically operated by one man. The coal is used on Northern Pacific Railway locomotives.

By courtesy of the Northern Pacific Railway

stock-yards and meat-packing plant. It is in the heart of the ranching country and rich agricultural lands irrigated from the South Platte. Denver is the gateway between mountains and plains; it is a meeting-place of railways from the east, along the foot of the Rockies, and from Salt Lake City; and its clear, dry air and beautiful scenery make it an attractive tourist centre and health resort.

MOUNTAIN BELT AND GREAT PLAINS

Pueblo (50,000), on the Upper Arkansas river, resembles Denver in position and occupations. Colorado Springs (33,000) is a noted health and tourist resort at the foot of Pike's Peak.

EXERCISES

1. Show how geographical conditions have influenced human settlement and occupations in the cordilleran plateaux of the United States.
2. By means of sketch maps indicate the exact location and economic importance of (*a*) Salt Lake City, (*b*) El Paso, (*c*) Denver.
3. Describe and explain the chief scenic features occurring in the plateaux of the western states. Illustrate your answer with diagrams.

CHAPTER XII

THE SOUTHERN STATES

As a whole, 'the South' is a low-lying, alluvial plain of vast extent, stretching from the Great Plains to the Atlantic, reaching the Gulf of Mexico on the south, and broken only by the Ozark Plateau and Southern Appalachians. The chief rivers are the Lower Mississippi and its tributaries the Arkansas and Red from the west, and from the east the Tennessee and Cumberland, both tributaries of the Ohio, which river may be regarded as roughly the northern limit of the Southern States.

In winter Florida and the Gulf Plains are warm, and the temperature falls farther north; but although the South has a mean January temperature above 32° F. cold snaps are liable to occur. Summer is hot, and is the wetter period of the year. Rainfall at all seasons tends to diminish both north and west. The South is suited to warm temperate crops, and capable of supporting a much greater population than the western states already described. The Southern States will be described under the following headings: (1) the Ozark Plateau; (2) the Southern Appalachians; (3) Florida and the Gulf Coasts; (4) the Cotton Belt.

THE OZARK PLATEAU

The Ozark Plateau is a broad, flat dome rising gently above the lowlands between the Mississippi and Great Plains, south of the Missouri and north of the Arkansas river. In rocks and scenery it closely resembles the Alleghany Plateau, while the neighbouring Ouachita Mountains on the south side of the Arkansas river are

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similar to the Alleghany ridges. In striking contrast with the open prairies, the highlands were forested, and when settlers were moving westward many were attracted by the wooded hills, which furnished logs for a house, wood for fuel, pasture for cattle, horses, and pigs, and opportunities for hunting and fishing. Lead and zinc are valuable minerals from the northern part of the Ozark Plateau, but future prosperity will depend on organized agriculture, animal-rearing, and reafforestation.

THE SOUTHERN APPALACHIANS

The Southern Appalachians contain part of the Piedmont Plateau, with its woods and pastures, which support great numbers of fine horses and fat cattle. Tobacco is the most important crop throughout the land bordering the Appalachians in North Carolina, Kentucky, Virginia, South Carolina, Tennessee, and Georgia, but, since it exhausts the soil, large areas are left fallow. Tobacco is native to America, and has always been smoked by the American Indians. The falls¹—furnishing hydro-electric power—and harbours at the edge of the plateau gave rise to towns, such as Richmond (183,000), Virginia, with enormous manufactures of tobacco. Lynchburg (40,000) is a railway centre, with tobacco and cotton factories.

West of the Piedmont Plateau lies the southern part of the Great Appalachian Valley, a fertile land of farms, growing wheat, maize, apples, and clover and pasturing sheep and cattle. Limestone is the chief rock of the Great Valley, a fact which explains the fertile soil, the good pastures, and the splendid roads; but much of the drainage goes underground in tunnels and caverns. Limestone supplies raw material used for making cement and as the flux² added to iron ore in smelting.

¹ *I.e.*, on the Fall Line. See pages 38 and 241.

² The limestone put into the blast-furnaces combines with impurities in the iron ore and produces a liquid slag, which flows from the molten iron, and can be run off.

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Birmingham, Alabama, is the only iron centre in the world in which all the raw materials are present in abundance in the immediate neighbourhood. Besides limestone, there are huge deposits of iron ore and abundant coal-supplies, so that iron-smelting and the manufacture of iron and steel goods can be carried on very cheaply. Birmingham is surpassed as an American iron and steel centre only by Pittsburg. It also manufactures cotton goods and cement, and is an important centre. The population has grown rapidly from only 3000 in 1880 to 260,000 in 1930.

Atlanta (270,000), capital of Georgia, has grown rapidly as a railway centre at the southern end of the Appalachians, with easy access to water-power, coal, and iron. Its cotton manufactures are important.

West of the Appalachian Valley rises the steep edge of the forested Appalachian Plateau, which sinks gently westward to the Mississippi plains, and is dissected by many valleys. It is an isolated region inhabited by poor, backward farmers, descendants of early Anglo-Saxon settlers, and, like them, living in log cabins, keeping a few sheep, pigs, and cattle, and growing small crops on the hillsides. The Appalachian Plateau in West Virginia, Kentucky, and Tennessee has untold wealth in coal and timber.

The slopes of the plateau in Kentucky are an extensive 'blue grass' country, where tobacco is widely cultivated.

FLORIDA AND THE GULF COASTS

The peninsula of Florida projects south for 400 miles. It bears every indication of its recent elevation from the bottom of the sea. Much of it is limestone, with many small lakes, while the surface is generally low, flat, and sandy, and dotted with swamps and pools. The coasts low and often marshy, especially on the south, where -eeless Everglades form a dense wilderness of tall.

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entangled spiky grasses and irregular swamps and water channels, with mangrove swamps along the coast. The east coast is remarkably even, with sand-reefs enclosing long, narrow lagoons and fine stretches of sandy beach, such as that of Daytona, where Sir Malcolm Campbell established the world's records (since broken) in his *Blue Bird* car, in February 1931, 1932, and 1933.

Fifty years ago Florida was little known; but during the present century development and growth in population have alike been rapid, although as yet less than 6 per cent, of the land is actually under crops. Florida's chief asset is her climate. Low latitude and exposure to the warm Gulf of Mexico and the Atlantic (into which passes the warm Gulf Stream) give Florida a remarkably mild, sunny winter, except for an occasional frosty spell due to cold, northerly winds. Summer is rather enervating and wet, and in late summer or autumn disaster may come to the east coast through the passage of hurricanes, which hurl stormy seas over the low beaches. Winter is the attractive season, and millions of visitors from the colder north, arriving by train, motor-car, liner, and private yacht, form the chief source of income in Florida. Jacksonville, Miami (111,000), and Palm Beach (27,000) are the chief tourist centres, equipped with most luxurious hotels. Bathing, golfing, and sea-fishing are especially attractive.

Florida's other great industry is the production of huge quantities of oranges, grape-fruit, and vegetables (beans, lettuces, tomatoes, celery, and potatoes) for rapid transport by rail to the northern markets. Florida oranges and grape-fruit also appear in the British market. The most serious drawbacks to the fruit industry are over-production (with a consequent fall in prices) and liability to damage by cold spells.¹ The fisheries are extensive, oysters, turtles, and sponges (of which Florida has almost

¹ Two spells of severe cold in the winter of 1894-95 killed nearly all the orange groves.

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a monopoly) being important. Timber production, mainly pine, has declined through the destruction of forests. Phosphate rock is important, supplying two-fifths of the world's phosphate—a valuable fertilizer. The mineral is preserved in fossil bones of rhinoceros, crocodile, shark, whale, and other creatures, and is found in scattered deposits in the west of the peninsula.

Jacksonville (130,000) is the largest city of Florida. It is a growing ocean port, with a large export of pitch-pine, resin, and turpentine. Tampa (101,000) and Key West (20,000) have cigar factories, employing Cuban and Spanish labour, for supplying the United States market, and thus escaping the import duty on Havana cigars from Cuba. Key West is also a naval port, a centre for sponge-fishing, and the terminus of a ninety-mile railway, built at fabulous cost (some £20,000 per mile) by a millionaire oil-king. This single-track railway was carried across the long string of palm-clad coral islands known as Florida Keys, the shallow channels being bridged by concrete viaducts and embankments. The railway provides a short sea passage to Havana.

The northern coast of the Gulf of Mexico, west of Florida Peninsula, is a hot, swampy lowland, fringed with lagoons and shoals. At rare intervals this coast is visited by destructive hurricanes. The flatness of the swampy land west of the Mississippi delta, combined with hot summers and abundant rainfall, has led to rice-growing on a large scale in Louisiana and Texas, where modern irrigation methods and the use of farming machinery have greatly increased the output and cheapened the cost of production, which is now actually below that of China or Japan, where hand labour is the rule. Sugar-cane, grown fairly widely in the Southern States, has long been cultivated extensively in the delta region, despite liability to damage by frost. Louisiana is the chief producer. Large tracts of very low-lying land, liable to floods, have been set aside as sanctuaries for wild birds and animals.

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THE COTTON BELT

The Cotton Belt is one of the most important regions of the country, for in value cotton is still one of the chief exports of the United States.

There are several varieties of cotton, but two are of supreme importance. Upland cotton, introduced into America¹ from South-eastern Asia in the eighteenth century, provides the great bulk of American output. Its fibres are of short staple—i.e., the fibre-threads are about one inch long—and a little coarse. The other type, Sea-Island cotton, produces fine silky fibre of long staple—i.e., the fibre-threads are as much as two or even two and a half inches long—suitable for the best qualities of cloth. Sea Island cotton in North America is mainly grown on small islands (hence its name) off the coast of Georgia and South Carolina, and the quantity is relatively small.

Cotton is planted annually, the seeds being sown in March or April. During June, July, and August the plant grows quickly to about four or five feet high, and its flower-pods, stuffed with white, woolly fibres, encasing the cotton-seeds, at length burst open, dotting the fields like big snowflakes. Cotton may be successfully grown on many different soils, but the most suitable is one rich in lime. Central Alabama, Central Texas, and the Mississippi 'bottoms'—i.e., low-lying areas near the river that are liable to flooding—which are the best three cotton regions, have soils rich in lime.

The Cotton Belt is roughly the south-eastern quarter of the United States, where suitable conditions exist over a huge area. The cotton plant requires a long, hot summer, with at least 200 days free from frost, and moderate but not excessive summer rainfall, followed by a fairly dry autumn for picking. The limits of the belt are fixed, on the north, by the length of the growing season, although

¹ Cotton was also found in America at the time of its discovery.

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improvements in early-ripening varieties tend to extend the belt northward; on the west, by the line of 23 inches of rainfall; and on the south the summer rains of the Gulf Coast are so heavy that cultivation is difficult, and the autumn rains may beat down the cotton before it has been picked. Another important factor in cotton cultivation is the supply of labour, since weeding and picking are done by hand. Cheap labour is provided by the negroes, whose standard of living is very low.

In colonial days the chief crops of the south-eastern states were rice, indigo, and tobacco. When cotton became a valuable export, because of the ease with which it might be grown with slave labour, it was found to exhaust the soil rather quickly. It became the rule, therefore, to cut down the forests to clear fresh land for cotton. Nowadays it is more usual—and less wasteful—to make use of artificial fertilizers^x to prevent exhaustion of the soil. The south-eastern states have long formed the greatest cotton area in the world. In 1936 the crop was 12,407,000 bales of 500 lb. each. Raw cotton is exported to Great Britain and Continental Europe, and enormous quantities are manufactured in the New England States. Cotton factories have also been established in the two Carolinas, Georgia, and Alabama, and, as the former shortage of skilled operatives is being overcome, their output is now nearly as great as that of New England. Cotton-seeds are crushed to obtain cotton-seed oil, used in soap-making, the waste pulp forming a valuable oil-cake for cattle.

A great change is taking place in the cotton states. For a century cotton was their only important crop. Then came the boll weevil, a small insect which first crossed the Rio Grande from Mexico into Southern Texas in 1892. The young insects eat their way into the bolls, or unripe cotton pods, and ruin the crop. Emerging from the bolls, the weevils fly off to lay their eggs elsewhere in the cotton-fields, and in this way spread destruction. Careful research

¹ Cotton-oil cake, phosphates, and animal and fish manures are used.

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has so far failed to find a way to defeat the pest. Dusting the fields with poison (sometimes spread by aircraft) has seemed of little avail. The Cotton Belt is now being extended westward and northward into parts of Texas where the insect cannot survive the severe winter. Above all, the Southern farmers grow other crops besides cotton, and have increased their stock of animals. During the Great War, when food-supplies were dear, ten Southern States increased their maize output 18 per cent., oats 50 per cent., rice 72 per cent., potatoes 60 per cent., sweet potatoes in per cent., hay 150 per cent., milking cows 16 per cent., and pigs 23 per cent. Besides the crops just named the Cotton Belt produces wheat, soya beans (an Asiatic bean very rich in fat), peanuts, walnuts, almonds, and beans, cultivation and harvesting being mainly done by machinery.. Maize supplies food for millions of pigs. Cattle,¹ horses, and mules are also important, especially in Texas.

The Cotton Belt was once forested in most parts with pine, oak, hickory, cypress, and other trees. For a time it was the chief lumber producer of the United States, but too intensive cutting and forest fires have greatly reduced the output. Pinewood for paper-making and turpentine (from the sap of pine-trees) are important.

The Cotton Belt, despite its great possibilities, is backward in development. The climate is not attractive to white settlers, although diseases such as cholera and typhoid fever have been made much less prevalent by modern sanitation and medical science. The black population has declined, owing to migration into the northern industrial areas, and the resulting labour shortage may become serious. There are great resources for development in manufacture, as well as in agriculture, animal-

¹ Cattle-rearing in the Cotton Belt was formerly unprofitable because of the ticks, which spread disease. Most of the area has been made free from ticks by driving the cattle through deep troughs of disinfecting liquid.

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rearing, and forestry. The immense supplies of petroleum and natural gas in Texas and Oklahoma will one day be exhausted, but there remain the great coalfields of the Southern Appalachians, Oklahoma, and Texas, and the water-power of the Southern Appalachians. Abundant iron ore, sulphur, salt, and phosphates are other resources. Barges on the Ohio, Mississippi, and other rivers give



riu. 59. J\ SUGAR IVEFINERY, INEW URLEANS

This refinery, covering seventy acres at the riverside, is one of the biggest
in the world.

By courtesy of the New Orleans Association of Commerce

cheap transport connexion with the states farther north. There is a good railway system throughout the region, and large quantities of manufactured goods and farm produce are sent south by rail for export through Gulf ports. The same railways take north huge supplies of early vegetables and fruits.

New Orleans (459,000) is the largest city of the South, and the outlet for the rich hinterland of the Mississippi-Missouri Basin. The city is built 100 miles from the sea, on the left bank of the Mississippi, and immediately south

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of Lake Pontchartrain, where the river is wide enough to accommodate hundreds of vessels. Flat-bottomed stern-wheel steamers bring bales of cotton, and wheat, maize, tobacco, timber, cattle, machinery, and other products down the river for export; the delta channel is dredged to keep it clear for ocean-going vessels. A ship canal from Lake Pontchartrain gives a shorter route to the Gulf of Mexico. New Orleans is not so well situated as New York and other Atlantic ports for trade with Europe. Sugar-refining and preparation of fertilizers are the chief manufacturing industries of New Orleans, and its chief imports are coffee, sugar, and bananas. A large element of the population is French-speaking—a reminder that the city was founded by the French.

Galveston (53,000), built on a sandspit off the coast of Texas, has a fine artificial harbour. A causeway over two miles long connects the city with the mainland. The wealth of Texas and the neighbouring states is reflected in the rapid growth of Galveston's export trade. Galveston is by far the most important outlet for United States cotton, and in value of trade as an American port is excelled only by New York. Other exports from Galveston are wheat, petroleum, and cattle.

Houston (292,000), an important railway centre recently connected with the Gulf of Mexico by a ship canal (fifty miles long), has become the largest inland cotton market in the world. Its development as a port will probably injure the trade of Galveston. Mobile (68,000), Alabama, and Pensacola (32,000), Florida, are other important Gulf ports, while Charleston (62,000), South Carolina, and Savannah (85,000), Georgia, are the chief ports of the Cotton Belt on the Atlantic coast.

The two leading inland towns of the Cotton Belt, apart from Birmingham and Atlanta (see page 210) are Memphis (253,000), Tennessee, the largest city on the Mississippi between St Louis and New Orleans, and a great market for raw cotton and lumber, and Dallas (260,000), the chief

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inland town of Texas, important as a railway and commercial centre, with meat-packing, oil-refining, leather, and other industries.

EXERCISES

i. There is much rivalry between Florida and California. Why is this? Briefly compare the two states.

2. Give brief accounts, accompanied by simple sketch maps, of the chief towns of the Cotton Belt.

3. The total United States cotton production in 1936 was 12,407,000 bales (of 500 lb. each), grown chiefly in the states given in the following table of production:

STATE	PRODUCTION (BALES OF 500 LB.)	STATE	PRODUCTION (BALES OF 500 LB.)
Alabama .	1,140,000	Missouri .	310,000
Arizona	170,000	New Mexico	110,000
Arkansas	1,295,000	North Carolina .	612,000
California	440,000	Oklahoma.	290,000
Florida	32,000	South Carolina .	820,000
Georgia	1,090,000	Tennessee.	431,000
Louisiana	763,000	Texas	2,945,000
Mississippi	1,910,000	Virginia .	34,000

Record these facts of cotton production on a map of the United States. Add a short explanatory note.

4. The total United States tobacco production in 1936 was 1,167,068,000 lb., grown chiefly in the states given in the following table of production:

STATE	PRODUCTION (1000 LB.)	STATE	PRODUCTION (1000 LB.)
Connecticut	21,429	North Carolina .	464,895
Florida	10,020	Ohio.	20,285
Georgia	84,080	Pennsylvania	32,50°
Indiana	4,480	South Carolina .	73.71°
Kentucky.	218,850	Tennessee.	76,098
Maryland .	29,600	Virginia .	101,517
Massachusetts .	6,385	West Virginia .	1,282
Missouri .	2,701	Wisconsin.	18,096,
New York	795		

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From these facts prepare a map to show the tobacco production of the United States.

5. Obtain the 1930 population statistics of the United States, and shade a map to indicate states where the negro ratio of the total population is (a) 50 per cent, and over; (b) 25-50 per cent.; (c) 5-25 per cent.; (d) below 5 per cent. Discuss the facts revealed by your map.

CHAPTER XIII

THE NORTH CENTRAL REGION

THE north central region, popularly known as 'the Middle West/' is the vast territory lying east of the Great Plains, extending to the Great Lakes and Ohio river, and on the south merging into the Cotton Belt. It is a region of plains, greatly affected by former ice sheets. Myriads of lakes are dotted over the surface in hollows scooped out of the softer rocks. These glacial lakes are most numerous in Minnesota, Michigan, and Wisconsin. In some areas the ice removed most of the soil, leaving the land useless for agriculture; in others heaps of boulders, layers of gravel, sand, or clay were deposited. Most of the land, however, is covered with a great depth of finely ground soils of high fertility. The valley of the Red river of the north, which extends into Canada, is one of the most fertile regions in the world, but on the shore regions of Lakes Superior and Michigan there are some areas of old bare rocks from which all soil has been removed. The north central region has a continental climate, with a big range of temperature. The summers are hot, but neither so hot nor so long as in the Cotton Belt. The winters are cold, most of the region having a mean January temperature below 32⁰ F. The rainfall is not so heavy as that of the Cotton Belt, but is ample for cereals and other crops, most of it falling in summer. The land is sufficiently level for the use of farming machines. Topography, soil, climate, and position near the Great Lakes and Mississippi have combined to make the north central states the most important farming region of the country, while it is the second most important manufacturing area

THE NORTH CENTRAL REGION

of the United States, and contains nearly one-third of their population.

THE OHIO VALLEY

The Ohio Valley is the border region between the Cotton Belt and the Maize Belt. It is a land of plains and rolling hills, with a winter climate as variable as that of England, but with longer and warmer summers. The most important money crop of the Ohio Valley has long been tobacco, especially on the 'blue grass' lands of Kentucky (see page 209). Wheat and maize are widely grown; pigs are common; horses and mules (in Kentucky) and sheep (in Ohio) are also important. The Ohio river is navigable, and, with the future development of the valley,¹ and the prevention of disastrous floods, will carry far more traffic.

Cincinnati (451,000), Ohio, is the biggest city on the Ohio river. Its leading industry is soap-making, and it is the centre of the American radio industry. Other important industries are metal goods, clothing, meat-packing, printing and publishing, motor-cars, and boots and shoes.

Louisville (308,000), the largest city of Kentucky, is also on the Ohio, and is the greatest tobacco market in the world, with immense vault-like warehouses for storing the hogsheads of tobacco brought in from the surrounding lands. Meat-packing and the manufacture of agricultural implements are important. Evansville (102,000), another town on the Ohio, is the big lumber market and furniture centre of Indiana.

THE MAIZE BELT¹

Maize is the only grain crop introduced into the Old World from the New. The name 'Indian corn' reminds one that maize was the chief cereal cultivated by the American Indians. It is an extremely valuable crop, as, under equally suitable conditions, it will yield twice as much grain per acre as wheat. Maize grows best where

¹ See page 153.

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the summer is long, free from frost, and has abundant sunshine. The middle of the summer should be continuously hot. During the rapid growing season there must be a moderate rainfall. Maize is grown in most parts of the United States, but the most important area lies immediately north of the Cotton Belt, where a very large region has the right climatic conditions, the rainfall coming mainly in brief thunderstorms. In addition, the soil is mainly an almost stoneless glacial drift of great fertility, and the land is level enough for easy ploughing. On the average farm of the Maize Belt more than half the grain acreage is under maize, other crops being oats, wheat, and barley. In addition, there are crops of hay and, in the most westerly part of the belt, alfalfa. In autumn, when the maize has ripened and dried on the stalks, the farmer harvests the crop by driving a wagon through the fields, cutting the corn cobs off, and throwing them into the wagon. The increasing use of motor-tractors for ploughing has led to an increase in the size of farms, but a decline in population, as fewer men are needed.

The chief product of the Maize Belt is meat. The farmer generally sells his wheat, but most of the maize and oats is used for fattening cattle and pigs and feeding horses and mules.¹ Most of the cattle are bred on the pastures of the drier: western lands (the Great Plains), and then sent to the Maize Belt for a few months' fattening before going to the slaughter-house. Pig-breeding is increasing in popularity, because pigs will produce more pounds of meat for a given weight of feed than will cattle. The greatest problem the farmer has to face is the declining fertility of his land, with the increasing necessity for artificial fertilizers.

West of Lake Michigan the land is more hilly and less fertile than the rest of the Maize Belt. Consequently cereal crops are not grown to the same extent, but a large

¹ It has been estimated that in the United States more than three-quarters of all agricultural produce is consumed by animals.

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proportion of the land is under pasture for dairy cattle, producing large quantities of milk, cream, butter, and cheese, while the skimmed milk helps to fatten pigs. Wisconsin is the chief dairy-farming state, with hundreds of co-operative creameries and cheese factories. Large quantities of fresh milk are sent daily to the neighbouring cities, especially Chicago and Milwaukee.

THE WINTER WHEAT REGION ¹

Throughout most of the Maize Belt winter wheat is grown, but in the western part, especially Kansas, where the rainfall is scarcely sufficient for maize, winter wheat is much more important. Wheat does not require so hot or so long a summer as maize, or so much moisture. The early growing season for wheat should be cool and moist, the ripening and harvest season warm, sunny, and fairly dry. A moderately stiff soil containing clay is best for wheat, and the land should be gently undulating, giving good natural drainage, yet permitting easy use of farm machinery. The limits of important winter wheat cultivation are largely determined by climate. To the north the increased cold of winter will kill most of the grain sown in autumn; on the west uncertain rainfall marks the change from wheat-growing to cattle-ranching; on the south the increasing heat and moisture are more suited to cotton than wheat; while on the east maize is a more profitable crop. The winter-wheat farmer makes the utmost use of tractors and other machines, and only requires additional labourers for harvest-time. He supplements his wheat production by fattening cattle, for which he grows fodder crops.

THE SPRING WHEAT REGION ^x

The rich, treeless prairie lands of North and South Dakota and Western Minnesota, consisting in the main

¹ See page 153. '

NORTH AMERICA

of the Red River Valley, form part of the greatest wheat-exporting region in the world, continuous with the more important section in Canada. In this vast region the winters are too severe¹ to permit the successful growth of winter wheat, so that spring-sown wheat is the great crop. Railways are easily made in these level, treeless plains, enabling the settler to reach the new lands and eventually to send away his wheat. Agricultural machinery can be used extensively, thereby cheapening the cost of production. Indeed, machinery is used on such a large scale that the wheat-producer has to be a skilful engineer as well as a farmer.

Although the average climatic conditions of the heart of North America suit wheat cultivation, in a region so far from the sea the climate is one of extremes. The intense cold of winter kills many insect pests, and the frost breaks up the clods into fine soil. The melted snows of spring and the light summer rains enable the grain to grow, while the warm, dry sunny days of late summer ripen the ears quickly, and produce a hard grain of good quality.² Despite these great advantages, however, enormous damage may result from prolonged drought or severe frost during the growing season. Damage equally serious may result from heavy hailstorms, weather that is too damp, or plagues of grasshoppers. Finally, when the harvest is exceptionally good the world price of wheat may be very low, because of equally good harvests in other wheatlands (Western Europe, Australia, Argentina, Russia). The wheat from the prairies has usually to be transported by rail and steamer thousands of miles to the consumers, and when world production greatly exceeds demand, as it has done in recent years, the farmer may have to sell at a price that scarcely covers the cost of

¹ The severity of the winter would not matter so much if the snowfall were heavy enough to act as a blanket to protect the grain.

² Spring wheat is harder than winter wheat, makes better flour, and so commands a higher price.

THE NORTH CENTRAL REGION

transport and other necessary charges. One finds, therefore, that—as in the Maize Belt—the farmer is taking up other branches of farming, especially dairy-farming, and making himself less dependent on wheat. The rearing of livestock also has the advantage of providing manure for land that is losing its fertility. Wheat-farming itself is being improved by the introduction of hardier types. Durum wheat, a native of South-eastern Russia, is grown in huge quantities in the spring wheat region of the United States, while Marquis wheat¹ is also very important. Besides wheat, big crops of barley, rye, oats, hay, and potatoes are grown.

St Louis (822,000) was first established as a fur-trading post on the first piece of high ground below the junction of the Missouri and Mississippi. Its position near the junction of three big waterways—Missouri, Mississippi, and Illinois—marked it as an important route centre, and it is now a railway centre of great importance. By railway and waterway St Louis distributes commodities over a wide region in the south-west, reaching even into Mexico. It is also a great market for cattle, horses, mules, and grain, and has important manufactures of boots, shoes, tobacco, agricultural implements, and flour.

Kansas City (400,000) stands at a bend of the Missouri, into which comes the Kansas river. In the early days of settlement boats came up the Missouri to this bend, whence covered wagons set out for Santa Fe and the south-west. Kansas City naturally became a railway centre, with a huge market for grain, cattle, horses, and goats. Its admirable position for receiving cattle from the west for fattening in the Maize Belt has made it second to Chicago as a slaughtering and meat-packing centre.

Omaha (214,000), on the Missouri, near the confluence of the Platte, is another important railway and meat-packing centre.

East of the Mississippi there lie Indianapolis (364,000),

¹ See page 305.

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Columbus (291,000), and Dayton (201,000), important as railway and market centres, and having manufactures of agricultural and other machinery.

Above St Louis the largest towns on the Mississippi are the "Twin Cities," Minneapolis and St Paul, the most important centres of trade and manufacture between Lake Superior and the Rockies. Minneapolis (464,000), metropolis of the wheatlands of the United States, stands near



L AIR-PORT OF ST LOUIS, 1931

This air-port is one mile square. Note the aeroplanes outside the hangars on the left and the hard-surfaced runways, permitting aircraft to take-off or land regardless of wind direction.

By courtesy of St Louis Chamber of Commerce

St Anthony's Falls, which mark the limit of navigation on the Mississippi, and also provide electric power. The latter is employed in great modern flour-mills, Minneapolis being the greatest flour-milling centre in the world. Agricultural machinery is also made.

St Paul (272,000) stands on the Mississippi seven miles below Minneapolis. It is the state capital of Minnesota, and a great collecting and distributing centre.

The north central states are well equipped with railways and roads, and the Great Lakes play a most important part in their industrial and transport activities.

THE NORTH CENTRAL REGION

Most of the land round the lakes was formerly forested with white pine, spruce, hemlock, and maple, but so rapidly has this timber been cut that Michigan, once the chief producing state, now finds it necessary to import big supplies, and much of the deforested land has been swept bare of soil by fires, rain, and wind.

The chief wealth of this lakes region lies in its minerals. On the southern shores of Lake Superior immense deposits of pure copper long made Michigan the greatest copper-producing state. The output is now surpassed by that of Arizona and Montana. Silver is a by-product from the copper-mines. Far more important than copper, however, are the enormous deposits of iron ore, the richest supply in the world. On the north and south of the western end of Lake Superior there are ranges of hills containing huge masses of solid iron ore, largely red haematite of great purity. Iron ores are widespread in the United States, but well over 80 per cent, of the present supply is obtained from the western shorelands of Lake Superior, above all from the Mesabi, Vermilion, and Cuyuna ranges, in Minnesota, north of Duluth. When the glacial soils are removed ore is exposed as much as 500 feet in depth. Railway tracks are laid along terraces dug into the deposits, and the ore is so loosely bound together that after a little blasting it can be dug out with great steam- or electric-shovels, which take a bite of several tons of ore, and drop it into railway trucks.¹ Whole trains are quickly filled and dispatched, largely under the power of gravity—which costs nothing—to the lake shores, at Duluth, Superior, and other ports. On the Great Lakes transport in special boats of 10,000 to 12,000 tons is very cheap, the loading being accomplished at over 750 tons a minute. Most of the ore goes to ports on Lake Erie—Toledo, Cleveland, Buffalo, and Detroit, or to Chicago, on Lake Michigan. Huge quantities pass on to Pittsburg, a

¹ The illustration of the Colstrip Mine, page 206, shows the methods adopted.

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journey of 200 miles, following nearly 1000 miles on the lakes. This very lengthy transport has led to the modern development of sending coal from the Northern Appalachian fields to meet the iron ore on the lake shores, where great iron and steel industries have grown up, at Chicago, Milwaukee, and Cleveland.

Duluth (101,000), at the western end of Lake Superior, has the biggest iron export and coal import of any port in the world. Its position also makes it a great wheat port, with giant grain elevators.

Milwaukee (578,000) stands on a good harbour on the western shore of Lake Michigan. Besides shipping wheat, Milwaukee has big industries in flour, meat, machinery, leather, and brewing. The population includes many Germans.

Detroit (1,569,000) was founded by the French as a fur-trading post. As railways in this region pass between Canada and the United States through Detroit, the latter stands at an important junction of land and water routes, where it is easy and cheap to assemble supplies of coal, iron, steel, and other commodities. Through the genius of Mr Henry Ford Detroit has become the world's greatest producer of motor-cars. In the Ford works the cars are built up piece by piece on a slowly moving platform that passes between two lines of workmen, each of whom performs the same small task on every growing car, and the finished cars can emerge into the testing-yard at the rate of 6000 a day. This mass production of cars and tractors has become so highly organized and centralized that the Ford Company has its own iron-mines, coalfields, ships, forests, and even supplies its own paint and glass. Besides the motor-car industry, Detroit has other metal and machinery manufactures, and engages in meat-packing and flour-milling. Many other towns in Southern Michigan and Northern Ohio share in some way in the motor-car trade.

The location of Toledo (291,000), at the western end of

THE NORTH CENTRAL REGION

To cope with its growing trade Chicago has enlarged its harbour, and the city looks forward to the time when the deepening of the Barge Canal and the Illinois Canal will [enable.it](#) to receive ocean-going steamers from the Atlantic and the Gulf of Mexico. A poet¹ of Chicago aptly describes his city as

Hog Butcher for the World,
Tool Maker, Stacker of Wheat,
Player with Railroads and the Nation's Freight
Handler;
Stormy, husky, brawling,
City of the Big Shoulders.

Many competent judges believe that Chicago will become the greatest city in the world; they may be right.

EXERCISES

i. Draw sketch maps to show the position and importance of (a) St Louis, (b) Minneapolis and St Paul, (c) Detroit, (d) Cleveland. Add notes on important facts not revealed in the maps.

2. "By its location Chicago was destined to become one of the world's greatest cities." Discuss this statement.

3. Write an account of the meat-packing industry of the United States.

4. Reproduce in map form the following figures of wheat output from the leading states in 1930 and 1936. Compare the maps with those showing maize and cotton production (see pages 176 and 218).

STATE	WHEAT PRODUCTION (1,000,000 BUSHELS)		STATE	WHEAT PRODUCTION (1,000,000 BUSHELS)	
	1930	1936		1930	1936
Colorado	22	11	North Dakota.	100	19
Idaho	28	21	Ohio	29	40
Illinois	42	36	Oklahoma	34	28
Indiana	29	31	Oregon	23	13
Kansas	169	120	Pennsylvania	25	19
Michigan	19	17	South Dakota	41	3
Minnesota	22	16	Washington	40	46
Missouri	30	31	1 Total for all states	« 51	626
Nebraska	73	47			

¹ Carl Sandburg.

CHAPTER XIV

NEW ENGLAND AND THE MIDDLE APPALACHIAN REGION

IN area the land to be described in this chapter is much smaller than that dealt with in the previous chapters on the United States, but it is a land of first-class importance, containing many large cities, and with a population nearly as great as that of England and Wales, or nearly one-third of the population of the United States in one-twentieth of their total area. These north-eastern states, or 'the East,' have many good harbours on the Atlantic, through which millions of immigrants have come during the last three centuries, and out of which passes the enormous stream of commodities destined for the markets of Europe.

THE NEW ENGLAND STATES

When the Pilgrim Fathers arrived at Cape Cod in 1620, after a stormy voyage of sixty-four days from Plymouth, they found a country that would call forth all their courage and strength if a colony were to be established. New England is a stern land; its ancient rocks are hard; agriculture is difficult; the winter climate is severe. Thousands of rivers have carved the rocks into rolling hills. There is very little coastal plain, for subsidence has drowned the valleys and brought the sea close to the hills. The glaciers of the Ice Age carried great stones and boulders from the Northern Appalachians, and scattered them over the lower lands. Some parts are so rocky that ploughing is impossible. In other parts the soils were scraped away, or only coarse, infertile sands were left.

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NEW ENGLAND

Ice action was not wholly bad, however. Some areas were covered with good soils, and the formation of innumerable lakes and waterfalls proved a great asset for power.

The early settlers found the land thick wth forests of spruce, pine, hemlock, oak, maple, and hickory. Before it was possible to till the ground the settler had to endure the heavy labour of cutting down trees, and digging out their roots. The presence of Indians and wolves added to his difficulties. Stones and boulders had to be cleared from the fields, and piled in heaps, or built into walls. The long, harsh winters, marked by frequent storms and heavy falls of snow that might mantle the ground for four or even five months, proved most disastrous to the old Puritan settlers, many of whom died under the severe strain. But they persevered, and farming became their mainstay.

The New England colonist made his little farm self-supporting. He grew wheat and maize for bread and porridge; pigs, sheep, cows, and wild game supplied animal food; wool was made into rough homespun cloth, and flax was grown for linen; leather for shoes and harness and timber for buildings and fires were there in abundance.

Hemmed in between the sea and the forested Appalachians, accustomed to prolonged struggle against unfavourable conditions, and neglected by their motherland, the English colonists developed a self-reliance and sturdy spirit of independent self-government that ultimately made them the founders of the United States. Since 1850, however, the composition of the New England population has greatly changed, owing to the influx of workers—Irish, French-Canadian, Italian, Polish, Russian, Austrian—attracted by the developing manufacturing industries. The New England states are Massachusetts, Connecticut, New Hampshire, Vermont, and Rhode Island, but Maine, which was admitted to the Union in 1820, may be conveniently considered along with New England.

At a very early stage farming in New England was

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supplemented by fishing. Good harbours, plenty of timber for boats, the difficulty of making a good living by farming as the population increased, all tended to encourage fishing. The coastal waters were teeming with fish, fed by the plankton¹ that drifts south from the Arctic Ocean in the Labrador Current. In winter ice could be used for preserving the fish, while the summer weather was cool enough to permit the drying of fish. The New Englanders, like their ancestors in Great Britain, not only became expert fishermen and boat-builders, but great sailors too. Hence New England in the seventeenth century developed an overseas trade, taking dried cod and salt herring to Mediterranean countries, and sailing on to the Guinea Coast for a return cargo of slaves for American plantations. Fish, flour, and timber for barrels were exported to the West Indies, the return cargoes being sugar, molasses, rum, cotton, rubber, and cocoa. New England schooners and clippers (the speediest sailing-ships in the world) became famous, and before the age of the iron ship New England and Canada were the greatest shipbuilders. New England ports also developed a great whaling industry, particularly in the pursuit of the sperm whale in tropical seas.' This persisted until, by the middle of the nineteenth century, gas and mineral oil killed whale oil as an illuminant.

The opening of the nineteenth century saw the beginnings of those manufacturing industries that form the modern basis of New England's prosperity. New England is a land of waterfalls, and of lakes which serve as reservoirs for water-power. The early cotton-mills were established at points where falls could be used for water-wheels, and as near a harbour as possible, so that the industry

¹ Plankton (Greek *planktos* = 'wandering') is the name given to the minute plant and animal organisms found floating in the ocean. The tiny plants in particular form the food of many fish, and are most abundant in cold waters. Some fish feed on smaller fish, but ultimately plankton is the basis of fish life..

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skill of her workers and highly efficient manufacturing and marketing organization.

Half the brass goods of the United States are made in Connecticut, and from this industry developed the manufacture of clocks and watches. Connecticut and the adjacent parts of Massachusetts also make huge quantities of needles, pins, hooks, bells, nails, screws, tools, typewriters, sewing-machines, firearms, bedsteads, locks, cutlery, and jewellery. Iron ore for the hardware industry is mainly imported from Spain, Algeria, and Cuba. It will be noted that these manufactured articles are valuable compared with their bulk, and that highly skilled workers are employed in their production. Heavy machinery, railway and bridge materials, are made for local use. The chief towns engaged in these metal industries are Springfield (150,000) and Waltham (39,000), Massachusetts; Hartford (164,000), New Haven (163,000), Bridgeport (147,000), Waterbury (100,000), and New Britain (68,000), Connecticut; Providence, Rhode Island. yBtich town'has certain noted specialities, such as clocks and watches in Waterbury and Waltham and typewriters in Hartford.

The manufacture of leather and leather goods, especially boots and shoes, is mainly concentrated in Massachusetts, despite the necessity of importing most of the hides. The chief centres are Brockton (64,000), Lynn (102,000), and Haverhill (49,000).

The north and south ridges of New England, known as the Green Mountains in Vermont, White Mountains in New Hampshire, and Berkshire Hills in Massachusetts, are a cool, wet region, unsuited to agriculture, but formerly supporting big forests. They have a small and scattered population. In autumn gangs of lumbermen go into the forests of pine and spruce, where they build log cabins to live in, and spend the winter felling trees. Teams of horses, and, in recent years, motor-tractors, drag the logs over the snow, which is usually deep, to the frozen streams. In spring, when the melting snows provide deep waters,

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the logs are floated down to the sawmills, wood-pulp and paper mills. The timber resources have been greatly reduced by too rapid consumption, and by forest fires. Besides wood-pulp and paper, there are manufactures of matches, boxes, furniture, and toys. The leading export centres are both in Maine: Bangor (29,000) and Portland (71,000). Portland is the nearest ice-free port to Montreal, and so shares in the Canadian winter traffic. It is also a big fishing-port. Maple sugar and syrup are other forest products of local importance. The chief minerals are granite and marble.

As a direct result of all her industries New England makes large quantities of machinery for manufacturing textiles, shoes, paper, and so on, machinery manufacture ranking third in the industries of the region.

The superior opportunities for farming offered by the fertile lands of the Mississippi Basin, and the attraction of high wages in the cities of New England itself, have led to a decline in rural population, and to-day New England farming is mainly confined to market-gardening and dairy-farming to supply the big urban populations of the region. Cape Cod and the islands near it have sandy, gravelly soils that are used for the intensive culture of cranberries and strawberries. The fishing industry flourishes in many ports for the same good markets, herring, shad, and mackerel being abundant. New Bedford used to be a great whaling-port.

New England is a land of cities; the greatest of them is Boston. Boston (781,000) was first settled by farmers from the Boston district of Lincolnshire. It is built on several peninsulas jutting into the estuary of the Charles river, on the shores of the huge Boston Bay. Its early development was hampered by the New England ridges. A road to Albany, on the Hudson, was completed in 1825, but the opening of the Erie Canal in the same year diverted most of the traffic from the West down the Hudson to New York, and it was not until the opening of the long

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Hoosac Tunnel, in 1873, giving better access to the interior,¹ that Boston began to take a big share in the export trade of the north-eastern states. Boston is the capital of Massachusetts, and the metropolis of New England trade. It has huge imports of hides and skins, cotton, wool, and other raw materials, which it distributes to other manufacturing districts, besides supplying its

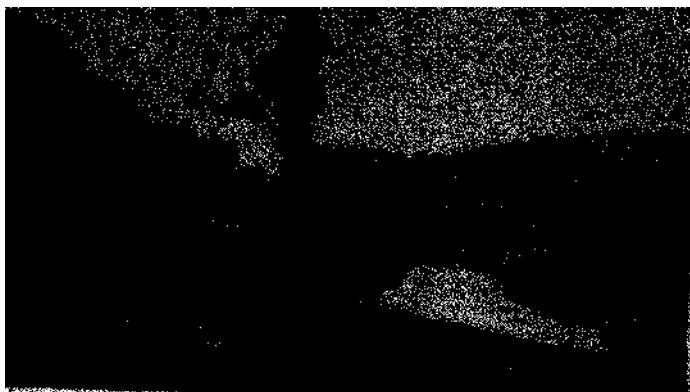


FIG. 63. A TRAIN OF HEAVY FREIGHT ON THE BOSTON AND ALBANY RAILWAY

Powerful locomotives are required for the difficult gradients in the mountains between Boston and the Hudson Valley. Contrast this picture with that of the Mohawk Valley (frontispiece).

By courtesy of the New York Central Lines

own great industries of iron and steel, textiles, clothing, paper, leather, and sugar. It exports great quantities of manufactured goods, besides grain and meat from the west. Boston has also a big coasting trade. The closely adjacent towns bring the population of the Boston district to 2,000,000. Across the Charles river, three miles from Boston, is Harvard University, founded at Cambridge in

. ^x A railway to Albany was completed in 1841, but its gradients were more difficult than those along the Hudson Valley to New York.

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1636. Yale University, the great rival of Harvard, is at New Haven, Connecticut.

THE MIDDLE APPALACHIAN REGION

The remaining region of the United States consists of two large states, New York and Pennsylvania, and three smaller ones, Maryland, Delaware, and New Jersey. It is a region of great industrial importance, and handles the bulk of United States commerce.

The region includes part of the Atlantic coastal plain, composed of sand, gravel, and clay deposited at the foot of the Piedmont Plateau—the Fall Line. In recent geological times the coast sank, so that the valleys of rivers, such as the Hudson and Delaware and their tributaries, were converted into long inlets: Chesapeake Bay, Delaware Bay, New York Bay, the Lower Hudson river, and Long Island Sound—all good harbours. On parts of the coast, as in New Jersey, sand has been driven by the tides to form barrier beaches enclosing lagoons. The soils of the coastal plain are suited to truck¹ crops—vegetables and small fruits—and, as in California and elsewhere, it is customary to find the crops concentrated on the soils best suited to them, and the farmers marketing their produce through their own co-operative associations. The Cape Cod region has already been mentioned (page 238). Long Island is a sandy island on which two long moraines stretch from end to end. At the western end of Long Island, near Brooklyn, and also at the eastern end, market-gardening flourishes, supplying potatoes, tomatoes, cabbages, and other vegetables and fruits to the great markets of New York. New Jersey grows fruits and vegetables for Philadelphia. There is similar market-gardening all round Chesapeake Bay, where the multitude of inlets provide cheap water transport. Long "Island Sound,

¹ *I.e.*, crops that can be transported to convenient buyers in a truck, or cart. In the United States a truck-farmer means a market-gardener.

THE MIDDLE APPALACHIAN REGION

Chesapeake Bay, and Delaware Bay are important for oyster-fishing, while along the coasts the fine broad sands and excellent bathing attracts huge crowds of summer visitors. Atlantic City (66,000), the terminus of a railway from Pittsburg and Philadelphia, is the chief seaside resort, receiving annually about 10,000,000 visitors.

The Piedmont Belt of Maryland, Pennsylvania, and New Jersey is a region of small, fertile, and highly pro-

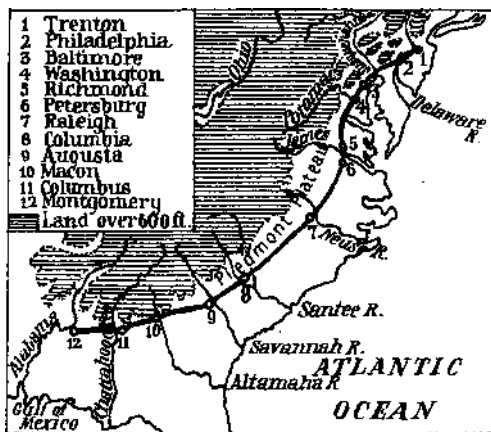


FIG. 64. THE FALL LINK TOWNS

ductive farms, owned by hard-working farmers. Maize and hay (chiefly for animal fodder), wheat, cattle, and pigs are the chief products, while the neighbouring cities are supplied with fresh milk and other dairy produce, eggs, and potatoes.

The Fall Line naturally provides the sites of great cities, owing to the break in navigation, the presence of water-power and—usually—of a good harbour. Philadelphia (1,951,000), at the head of ocean navigation on the Delaware river, and its junction with* the Schuylkill, about one hundred miles from the sea, is the greatest of the Fall Line towns, and, in size, the third American city.

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Philadelphia was founded by William Penn in 1682, and is often called the Quaker City. The Declaration of Independence was signed there in 1776, and, until the building of Washington, Philadelphia was the capital city of the United States.

Nearness to the anthracite coalfields is a big advantage, coal being brought by canal and railway for the city's great industries, and for export to New England and other parts of the Atlantic coast. The leading industries are textiles (especially woollens and cottons, clothing, and carpets), machinery, leather, shoes, locomotives and other railway stock. With a splendid harbour, good supplies of coal and steel, and abundant skilled labour, Philadelphia has an important shipbuilding industry. There are excellent railway connexions with New York, Baltimore, and the South, and with Pittsburg by lines passing through Harrisburg and across the Appalachians.

Of numerous other towns near Philadelphia the most important are Trenton¹ (123,000), the capital of New Jersey, with manufactures of pottery and chinaware, and Wilmington (107,000), at the head of Delaware Bay, with important manufactures of machinery, explosives, and chemicals.

Baltimore (805,000), on Chesapeake Bay, is the biggest city between Philadelphia and New Orleans, and contains nearly half the population of Maryland. Its command of excellent waterways makes it a great distributing centre. Baltimore also has important manufacturing industries, notably of clothing. The canning of fruits, vegetables, and oysters is carried on in many large factories. Artificial fertilizers, tobacco, and iron and steel goods, including heavy machinery and railway materials, are also manufactured, Cuban iron ore being imported. The chief exports of Baltimore are grain, flour, tobacco, iron and steel goods, and coal (from Pennsylvania).

¹ Oil July 4, 1932, Trenton became a sea-port, the Delaware having been dredged to a minimum depth of 20 feet.

THE MIDDLE APPALACHIAN REGION

Washington (487,000) is another Fall Line town, standing on the Potomac, fifteen miles below the Falls, which supply the city with water and electric light and power. The early Congresses could not agree as to which city should be the capital, so they decided to build a new one, worthy of their great nation, near the home of George Washington, the first President, after whom the city was called.

George Washington himself had the city planned by Major L'Enfant, of the French Army, the main features being streets at right angles, diagonal avenues, and abundant open spaces. The city is built in the District of Columbia, formerly a portion of Maryland, but now controlled by the Federal Government. As the centre of Federal Government, Washington has many important buildings: the Capitol, where Congress meets; the White House, the official home of the President; the many Government offices; and the residences of foreign ambassadors. Washington is one of the most beautiful cities in the world, and Americans take great pride in improving it by the addition of imposing new buildings, parks, and avenues.

Harrisburg (80,000), the capital of Pennsylvania, stands on the Susquehanna, at the point where it leaves the Appalachian ridges. In the narrow, isolated valleys of the Appalachians mixed farming prevails—wheat, maize, cattle, and pigs being typical—but development is handicapped by difficult transport. In the western part of the ridges, however, where they approach the Appalachian Plateau, there are valuable deposits of anthracite coal,¹ occurring in downward-bending strata. This anthracite of North-eastern Pennsylvania is the remains of a vast supply, of which the greater part has been denuded. The anthracite is found within an area of 480 square miles, and, although the bent strata make mining expensive, the

¹ The anthracite is about 2½ times as valuable per ton as the ordinary bituminous coal mined in Pennsylvania.

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demand for anthracite as a domestic fuel * in the big cities of the eastern states has built up a great mining industry in the upper Susquehanna and Schuylkill Valleys. Over a million people are directly dependent on the industry, the chief mining towns being Scranton (143,000) and Wilkes-Barre (87,000). The miners are Welsh, Irish, Italian, and East European Slavs. The average annual output of anthracite is over 50,000,000 tons, and seven railways have been built to convey it to the big cities. A manufacture of wire cables and mining machinery is carried on in the district, and the making of textiles, especially silk, employs many of the women.

The western half of Pennsylvania and the adjoining part of New York State are part of the dissected Appalachian Plateau, which on the north overlooks the Hudson and Mohawk Valleys. The eastern edge is steep, part of it forming the Catskill Mountains, but the plateau sinks gently west to the Great Lakes and the Ohio Valley. The northern part of the plateau has been worn down to a lower elevation than the southern part, and is a region of rolling hills, largely devoted to pastures and hayfields for dairy cattle. Fresh milk is sent by special express trains to the great cities, and cheese-making is important. The chief cereal is buckwheat, a hardy grain that will grow on poor soils, and may be sown late (May to mid-August), perhaps after a maize crop has been killed by frost. The biggest town of this region is Binghamton (77,000), a shoe-manufacturing centre.

The greatest wealth of the Appalachian Plateau is its abundant fuel. A huge coalfield lies below the surface of most of the plateau from Pennsylvania to Alabama; petroleum and natural gas have been stored in the deeper rocks. In 1936 New York State produced 4,663,000 barrels of petroleum, and Pennsylvania 17,070,000 barrels, besides great quantities of natural gas. A good deal of the

¹ The cold winters necessitate central heating, and the furnaces usually burn anthracite.

THE MIDDLE APPALACHIAN REGION

petroleum is refined on the spot, but some is pumped through pipes to Buffalo, New York, and Philadelphia, to be refined and exported. The gas is also conveyed long distances by pipes. These fuels are being exhausted, and the coal forms a more permanent basis of great industries. The coal is easily mined because the seams are nearly

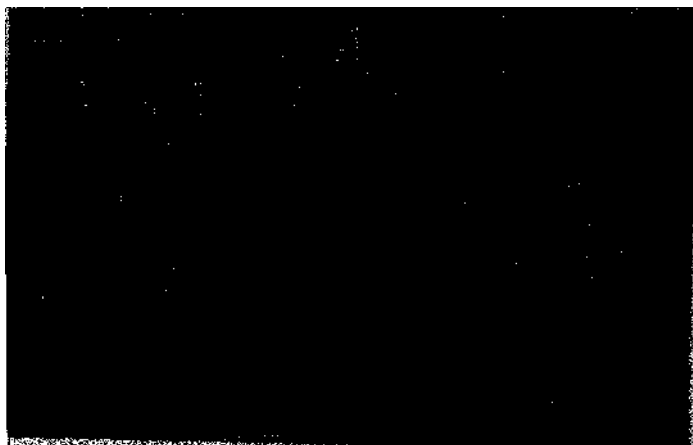


FIG. 65. THE HEART OF INDUSTRIAL PITTSBURG

Note the stern-wheel river steamers on the water-front of the Monongahela river.

By courtesy of the Manchester Guardian Commercial

horizontal, and in many cases outcrop in the sides of valleys. Hence it is possible to drive shafts horizontally into the hillsides, and loaded trucks can be run down into the valley to a railway or a boat. The extensive use of coal-cutting machinery tends to an increased output per miner. Pennsylvania is the greatest coal-producing state. Large quantities of coal are transported by the upper Ohio and its tributaries, some going even to New Orleans. The finest coking coal in America is that from round

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Connellsville, near Pittsburg, and as this district also contained iron ore and limestone Pittsburg became the greatest iron and steel centre in the world.

Pittsburg (670,000) stands where two navigable rivers, the Monongahela from the south, and the Alleghany from the north, unite to form the Ohio. The junction of these valley routes in a plateau region has made Pittsburg the focus of both railway and water routes in Western Pennsylvania, and the handling of the enormous traffic in minerals and manufactured goods presents a grave problem. Railways, works, and offices crowd the banks of the narrow valleys, while most of the city is built on the plateau and reached by steep inclines. Pittsburg and neighbouring valley towns manufacture every type of iron and steel goods; electrical and other machinery, locomotives, rails, girders, tools, nails, and so on. The local supplies of iron ore have been worked out, and big quantities are obtained from Eastern Pennsylvania. But by far the greater part of the iron is brought from the rich mines at the western end of Lake Superior, reaching Pittsburg *via* ports on Lake Erie and canal or railway after a journey of 1000 miles. Pittsburg has long had a reputation for the fine quality of its glass, due to the use of the purest fuel, natural gas, in fusing the sand.

Pennsylvania produces winter wheat, oats, maize, buckwheat, and rye; potatoes, tobacco, hay, and apples. Cattle, especially milking cattle, pigs, sheep, and horses are reared in large numbers. Iron, steel, and coal employ most workers and most capital, but there are also important manufactures of textiles, chemicals, paper, pottery and glass, leather and rubber, cement and bricks. Pennsylvania has over one-third of the United States iron and steel trades, and 40 per cent, of the silk manufactures.

New York State is of supreme importance because it contains the Hudson and Mohawk Valleys. On the north of the Mohawk Valley lie the Adirondack Mountains,

THE MIDDLE APPALACHIAN REGION

rising to 4000 feet, and famed for their picturesque mountain scenery, with forests, lakes, and rivers. The Adirondacks and the Catskills—the latter famous as the scene of Rip Van Winkle's lengthy slumber—to the south of the Mohawk Valley, attract many visitors from the crowded cities. The most northerly part of New York State, where the Adirondacks slope towards the St Lawrence Valley, is devoted to dairy-farming, and has many cheese factories.

The Great Lakes may be approached by two routes: the St Lawrence Valley, a route that has the disadvantage of being ice-bound in winter, and the valleys of the Hudson and Mohawk, which give access to an ice-free harbour. New York State, therefore, contains the corridor through which there passes the greatest volume of traffic in the world.

Buffalo (573,000) stands at the eastern end of Lake Erie, the lake carrying most traffic. Buffalo receives the prodigious bulk of wheat, maize, oats, timber, iron ore, meat, hides, and other products brought by lake steamers, and passes it on by the Barge (Erie) Canal, or by rail, to New York. The shipping tonnage entering Buffalo harbour exceeds that of Liverpool. With such a splendid location for assembling bulky raw materials, Buffalo has rapidly developed important industries. Buffalo is also near the greatest source of power in the world: Niagara Falls, which furnish electric power at a much cheaper rate than is possible in New York or Philadelphia. Cheap coal is available also, as Pennsylvania sends return cargoes of coal in the freight boats, for distribution to the lake ports, or for use in Buffalo itself. Buffalo ranks next to Minneapolis as a flour-milling centre; its stockyards for cattle are second only to those of Chicago; the advantage of unloading Lake Superior iron ores alongside the blast-furnaces has led to iron and steel manufactures, such as motor-cars and locomotives.

Along the 400 miles of waterways between Buffalo and

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New York there is a string of towns, all having the advantages of cheap coal, water-power, water transport, and access to abundant raw materials and good markets.

Rochester (328,000) stands on the shore of Lake Ontario, where the river Genesee falls 205 feet over the same escarpment that produces Niagara. The Barge Canal brings wheat, and takes away flour milled in Rochester. A canal to the Upper Alleghany gives access to the Ohio, whence come timber, oil, grain, and hemlock bark (for tanning). Rochester makes shoes, men's clothing, optical goods, and photographic apparatus. It is the home of the Kodak Company, and produces more than half of America's photographic materials.

Syracuse (209,000) employs electric power from Niagara, and from steam-driven dynamos dependent on coal. Soda is manufactured from local salt and limestone. Utica (102,000) makes knitted goods. Schenectady (96,000), an early Dutch settlement, makes electrical machinery and locomotives. Troy (73,000) makes nine-tenths of America's collars and cuffs, and is at the junction of the Barge Canal and Hudson river. Albany (127,000) has an important position at the junction of routes: south to New York, west by the Mohawk Valley, north by the Champlain-Richelieu Valley to Montreal, and east by rail to Boston. Albany has many industries, including heating-stoves, writing-paper, chemicals, and toys.

The early Dutch settlers found that the Hudson provided an excellent harbour, sheltered by the western end of Long Island, and also furnished a route inland. They therefore established their settlement of New Amsterdam—destined to become New York in English hands—on the southern end of Manhattan Island, on the eastern shores of the Hudson estuary. New York had as rivals Boston, Philadelphia, and Baltimore. But New York outstripped them because it alone had a waterway leading to the Mohawk Valley, and when the Erie Canal was opened in 1825 New York at once became the great outlet for the



FIG. 67. MANHATTAN ISLAND, THE SITE OF NEW YORK CITY

This wonderful photograph shows the whole of Manhattan, with the Hudson river and Jersey City on the left, the East river and Brooklyn on the right. The suspension bridges crossing the East river are, from south to north, Brooklyn, Manhattan, and Williamsburg Bridge. The new George Washington Suspension Bridge crosses the Hudson to New Jersey. Note the many piers for ocean coastal and river shipping; the skyscrapers; Central Park (840 acres); and the rectangular street plan. The north-south avenues are numbered from east to west, the east-west streets from south to north; Broadway cuts from north-west to south-east. In the south of Manhattan lies the financial district of New York, where the streets, dating from Dutch and English Colonial days, are narrow and irregular.

Fairchild Aerial photograph, by courtesy of Wide World Photos

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underground railways have been made to deal with the dense throngs of passengers.

The southern end of Manhattan Island is the heart of New York. The concentration of business premises in such confined space increased the cost of land to such a degree that, when cheap steel was invented, the era of the skyscraper began (about 1880), the object being to get as much accommodation as possible on each site. Hundreds of buildings are more than ten stories high, and great modern skyscrapers reach appalling heights, yet contrive to present a peculiar beauty of their own. The Woolworth Building (fifty-three stories) is 792 feet high; the Chrysler Building rises to 1046 feet (three times the height of St Paul's Cathedral); the Empire State Building (eighty-six stories, with an additional sixteen inside the mooring-mast for airships) reaches 1240 feet. Electric lifts, or elevators, rapidly convey people to the different floors, and during business hours these great buildings may contain 25,000 to 30,000 people—the population of Shrewsbury. New York contains people of every race and culture: Germans, English, Poles, Czechs, Hungarians, Scots, Swedes, Norwegians, Greeks, Danes, Dutch, Jews—to name only a few. There are more Irish than in Dublin, and more Italians than in Rome.

Beyond the Hudson there are in New Jersey a number of towns that may be regarded as parts of Greater New York. Newark (442,000) makes leather, electrical and other machinery, and locomotives. Jersey City (317,000) has sugar and tobacco factories. Paterson (139,000) has a greater silk industry than that of Lyons, in France. Elizabeth (115,000) makes half the sewing-machines of the United States. Bayonne (89,000) is the terminal of an oil-pipe line from Pennsylvania, and has petroleum refineries.

The Lower Hudson seems destined long to remain the greatest urban concentration in the world. The huge population itself constitutes an immense market for com-

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modities, and explains the growing multitude of busy factories. A great proportion of the population is actually engaged in providing food, clothing, and other necessities, living accommodation, transport, and recreation for the teeming millions of residents and visitors, who throng this amazing product of geographical influences and human ingenuity.

EXERCISES

1. Show to what extent the development of the New England states resembles that of England.
2. Compare the cotton-manufacturing industry of New England with that of (*a*) the Southern States, (*b*) Lancashire.
3. By means of sketch maps and notes describe the position and explain the importance of (*a*) Boston, (*b*) Philadelphia, (*c*) Baltimore, (*d*) Washington, (*e*) Buffalo.
4. Write a full account of the iron and steel industries of the United States, emphasizing the most recent developments.
5. Compare New York with London, in position, development, and present importance.

CHAPTER XV

CANADA: ITS RESOURCES, TRADE, COMMUNICATIONS, AND NATURAL REGIONS

CANADA is in size the greatest country in the British Empire, its area being 3,690,000 square miles—a little larger than Continental Europe; yet its population is small—about 10,376,000. New York and Chicago together have a larger population. Geographical conditions explain why the people live in the southern margins of Canada, and why the greater part is virtually unpeopled. About three-quarters of the population are Canadian born, and mainly of British stock. In recent years the principal immigrants have been British, United States, German, and Scandinavian. Great numbers have crossed the border from the United States, owing to the attraction of cheaper land. The population of Canada is much more uniform in type than that of the United States, but one finds important 'islands' of alien peoples, such as the German area round Kitchener (Ontario) and the Icelandic fishing settlement, founded in 1876, on the shores of Lake Winnipeg. The native Indians have already been mentioned (page 83). The people of French descent (mainly in Quebec Province) form more than a quarter of the total population. There are in British Columbia a fair number of Chinese and Japanese, but further immigration is unlikely owing to the restrictions imposed (see page 282).

The vast territories of Canada became British not so much by conquest as by right of discovery and settlement. France ceded Nova Scotia in 1713 (Treaty of Utrecht), and fifty years later gave up Canada, together with its

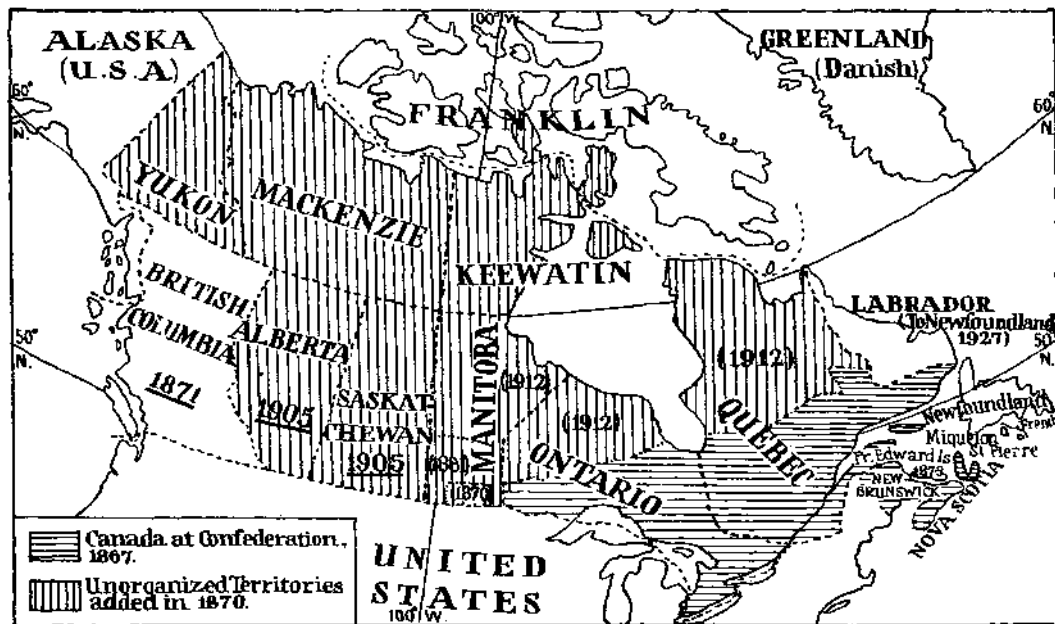


FIG. 68. THE GROWTH OF CANADA

Dates underlined indicate the year of admission of new provinces to the Dominion. Dates in brackets record additions to existing provinces. Yukon became a separate Territory in 1898. Mackenzie, Keewatin, and Franklin are provisional divisions of the North-west Territories dating from 1920. Newfoundland (with Labrador) forms a colony separate from Canada.

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dependencies, including Prince Edward Island and New Brunswick. But Canada at that time meant only the lands immediately north of the St Lawrence and Great Lakes, and even when the Dominion of Canada was formed, by royal proclamation on July 1, 1867, in fulfilment of the British North America Act, 1867, it consisted merely of Upper and Lower Canada (now parts of Ontario and Quebec), Nova Scotia, and New Brunswick. At the close of the American War of Independence (1783) a large body of people who wished to remain under the British flag left the United States, and, as the United Empire Loyalists, formed the first real settlers in what later became the provinces of Ontario and New Brunswick. Canada owes a great deal to their vigorous efforts and unswerving loyalty.

Modern Canada has grown, like the United States, by westward expansion to the Pacific. In 1869 Rupert's Land, or the North-west Territories, was purchased from the Hudson's Bay Company—which had held that immense area since 1670—for £300,000, and one-twentieth part of the land classified as the Fertile Belt. The Company retained all its posts and stations, and was allowed to carry on its trade. Manitoba was made from part of Rupert's Land, and was admitted to the Dominion in 1870. In 1871 British Columbia was admitted, and Prince Edward Island in 1873. Alberta and Saskatchewan achieved the status of Dominion provinces as recently as 1905. Canada now possesses all the Arctic islands north of the mainland except Greenland.

Canada is governed by a Senate of ninety-six members, nominated for life, and a House of Commons elected for a period of five years. The nominal head of the Government is the Governor-General, representing the British Sovereign. Canada, and all the other self-governing Dominions, were stated at the Imperial Conference of 1926 to be equal in status within the Empire, free to control their own affairs, and united together by common

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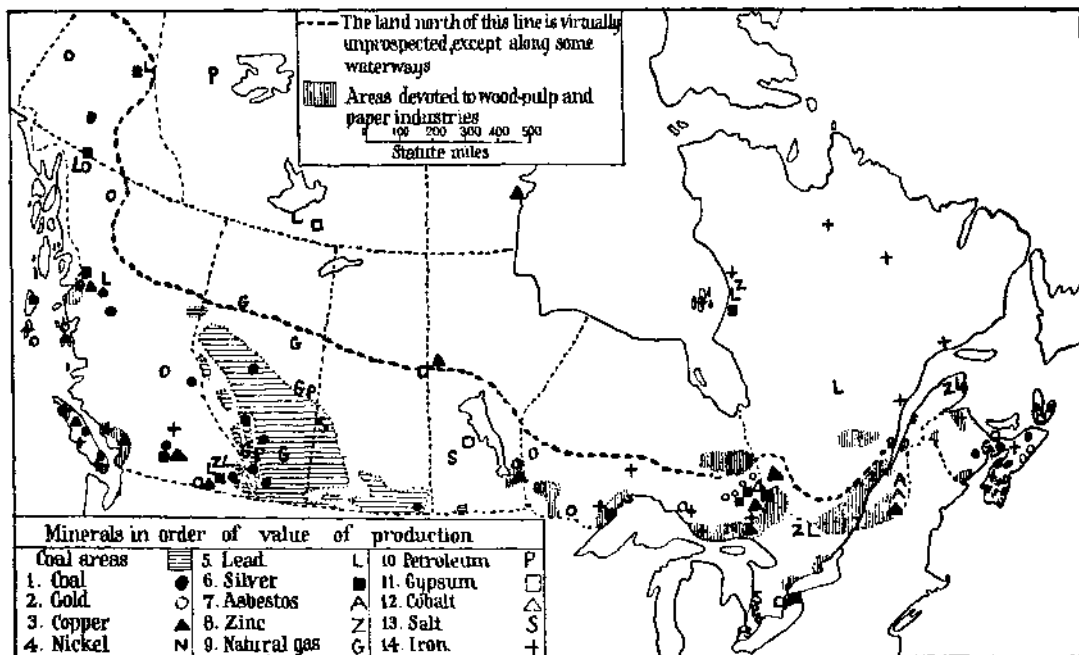


FIG. 70. DISTRIBUTION OF MINERALS AND OF WOOD-PULP AND PAPER INDUSTRIES IN CANADA

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year ending March 31, 1936) were as follows: newsprint paper (made from wood-pulp), 90,761,000 dollars; wood-pulp, 28,104,000 dollars; planks and boards, 27,605,000 dollars; ,wood shingles, 7,693,000 dollars; pulp-wood, 6,943,000 dollars.

Minerals and goods made from metals rank next, the export value for the same year being as follows:

PRODUCT	VALUE (\$1,000,000)	PRODUCT	VALUE (\$1,000,000)
Gold	88	Zinc.	8
Nickel	42	Lead	8
Copper	30	Asbestos .	8
Motor-cars	24	Farm implements	6
Silver	12	Platinum .	5
1 Aluminium	9		

The chief mineral areas are the Canadian Shield and the Rockies. The leading minerals extracted (in order of value for the year 1929) are indicated on Fig. 70, page 259.

Foods and other products derived from animals form another great class of exports, to which fish may be added. The export values for the same year are as follows:

PRODUCT	VALUE (\$1,000,000)	PRODUCT	VALUE (\$1,000,000)
Fish (salmon, lobster, cod, etc.)	24	Furs	16
Meats	24	Live cattle	7
		Cheese	7
		Leather	4

In 1936 Canada had 3,874,000 milking cows, 4,946,000 other cattle, 2,919,000 horses, 3,370,000 sheep, 4,139,000 pigs, and 59,298,000 poultry. This animal-rearing is mainly part of the system of mixed farming now carried

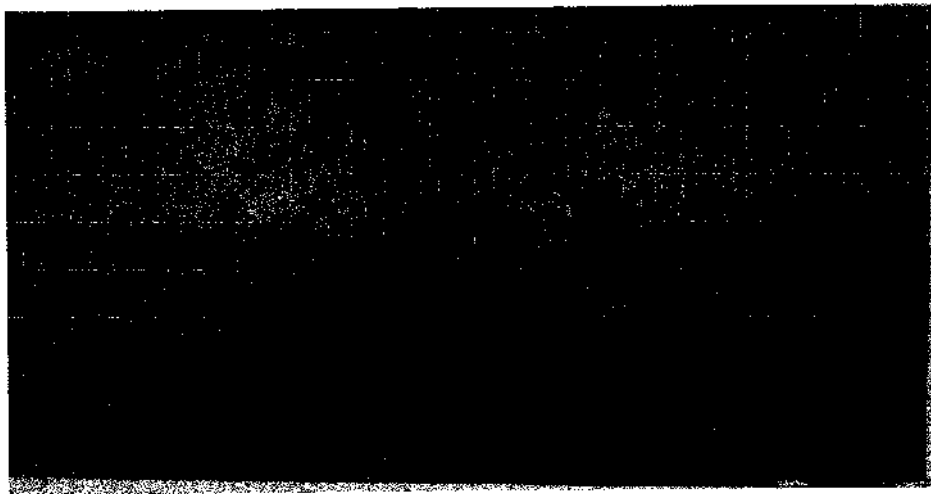


FIG. 71. MOOSE FACTORY, 1854

A Hudson's Bay Company's fur-trading post at the southern end of James Bay.

By courtesy of the Governor and Committee of the Hudson's Bay Company

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on in most parts of Canada. The declining fertility of the soil must be restored by the rotation of crops and the addition of manures. Under the system of crop rotation the farmer avoids planting the same crop on a piece of land year after year. He changes his grain crops, and in some years grows clover or alfalfa, turnips or some other root crop/ The land is thus able to recover some of its fertility, as the crops will not all extract the same foods from the soil, while clover and alfalfa actually enrich the soil by increasing its content of nitrogenous food. By keeping animals the farmer not only increases the variety of his produce, but also ensures a supply of manure. Dairy-farming is most important in Ontario and Quebec, while fruit production is greatest in Ontario, British Columbia, and Nova Scotia.

The fur trade was once wholly supplied by trapping, the main region being the Canadian Shield. But in recent years the breeding of fox, muskrat, beaver, mink, racoon, marten, and other animals on fur farms has grown into an important industry, which in 1934-35 supplied nearly one-third of the value of Canadian furs, there being over 7000 fur farms, chiefly silver fox.

The fisheries of the Grand Banks and other shallows near Eastern Canada, the coastal waters of British Columbia, the many lakes and rivers of the interior, and Hudson Bay produced fish to a value of over 34,427,000 dollars in 1935, the chief fish being (in order of value) salmon, lobster, cod, herring, whitefish, sardine, halibut, and haddock.

In the value of manufactured products the leading classes of articles are vegetable products, wood and paper, iron and iron goods, animal products, and textiles. Another item ranking high in Canadian exports is rubber and goods made from rubber—tyres, Wellingtons, tennis shoes, etc. Manufacturing industries are chiefly carried on in Eastern Canada.

The list of Canadian imports reveals the needs of the

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country in commodities that Canada cannot produce herself, or that she finds it more advantageous to obtain elsewhere. The chief imports for the year ending March 31, 1930, and March 31, 1936, were as follows:

I 7 ARTICLE'S	VALUE (\$1,000,000)		ARTICLES	VALUE (\$1,000,000)	
	1930	1936		1930	1936
Iron and products (auto mobile parts, machinery, steel plates, etc.) .	194	114	Fibres, textiles, and textile products (wool, wool products, raw cotton, cotton products, etc.) .	131	90
Agri cultural and vegetable products (sugar, fresh fruits, vegetable oils, etc.)	105	100	Books, printed matter, paper .	33	16
Non-metallic minerals and products (petroleum, coal, etc.)	143	105	Rubber .	11	7
			Total of all products.	1248	563

Canada resembles Argentina, Brazil, Australia, South Africa, New Zealand, and other great farming countries in the present necessity for importing some of her requirements in railway materials, farming machines and implements, and other iron and steel manufactures, and supplies of textiles. With the expansion of Canadian manufacturing industries this dependency on imports will be reduced. Canada has considerable coalfields, but those in Alberta and British Columbia are only important in their own provinces, and the better-situated coal of Nova Scotia cannot compete in the Great Lakes region with supplies from Ohio and Pennsylvania. Canada finds it necessary to import coal to the same value as her own production.

CANADIAN WATER-POWER

In hydro-electric power development Canada is the second country in the world, the United States ranking first. Abundant water-power occurs in most parts of Canada, and there is scarcely a hamlet where electricity

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is not available. Over 98 per cent, of Canadian electricity is produced by water-power, and it is estimated that the 7,946,000 horse-power developed by the, end of 1936 is under 20 per cent, of the power available. Cheap power has been a big factor in the industrial development of Canada. The rapid expansion of the pulp and paper industry—the greatest Canadian manufacturing industry—is due to abundant and cheap water-power close to huge supplies of the finest pulpwood. Other industries, such as mining, have also benefited by cheap electricity, and nearly 80 per cent, of manufacturing machinery is electrically driven. The farmer, especially in Eastern Canada, can use electricity to milk the cows, separate the cream, make cheese and butter, pump water, and chop fodder, while his wife has the benefit of electric lighting, cooking, washing, and cleaning. On the St Lawrence river Canada owns 3,000,000 horse-power, this being three-quarters of the total available. Quebec, Ontario, and British Columbia have the most important power developments. The numerous lakes furnish heads of water giving a constant flow for power.

Canada has commercial relations with all parts of the world, but 80 per cent, of her export trade, and 80 per cent, of her import trade is with the United States and Great Britain. Canada naturally has more commerce—especially imports—with her great neighbour than with the British Isles, although the Ottawa Trade Agreement of 1932 has led to some expansion of trade with Britain. While 60 per cent, of all enterprises in Canada depend upon Canadian capital, there has been a striking change in the values of outside capital invested in Canada. In 1913 the United States had 650,000,000 dollars, and Great Britain 2,500,000,000 dollars invested in Canada. In 1934 the figures were United States 3,983,000,000, and Great Britain 2,734,000,000. Canada herself has 2,029,000,000 dollars invested in other lands, mainly the United States and South America.

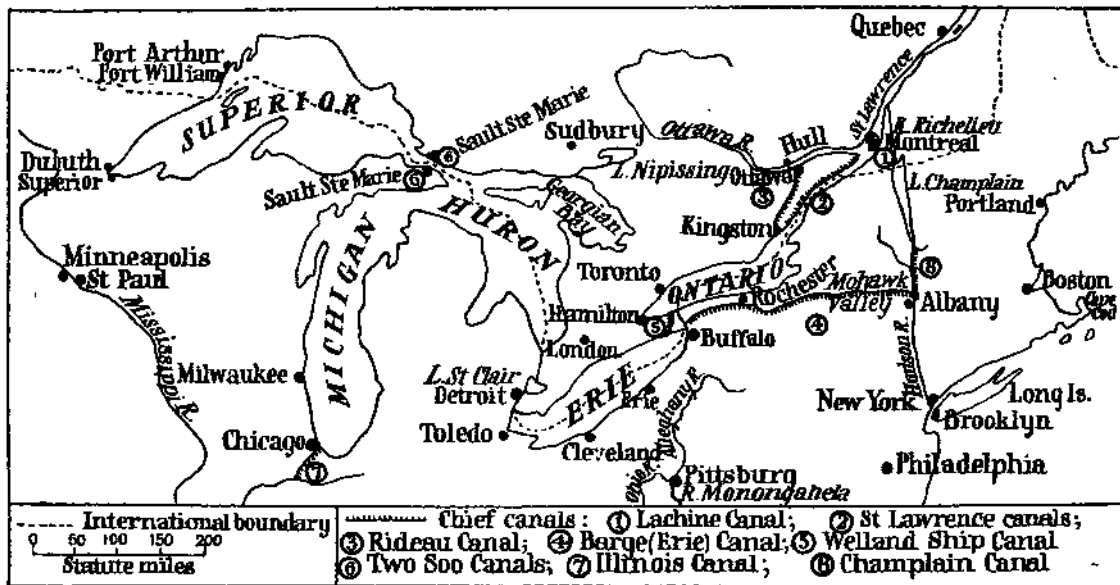


FIG. 73. THE GREAT LAKES AND ST LAWRENCE WATERWAYS

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operate all the year round, unlike waterways, which are icebound in winter. In 1869 there were only 2524 miles of railway in Canada; in 1936 there were 42,916 miles with the standard British gauge, 4 feet 8½ inches. More than half the mileage is controlled by the Canadian National Railways, the largest single system in North America, built up largely by taking over private companies: the Grand Trunk, in Quebec and Ontario, with lines to Chicago and Portland, Maine; the National Transcontinental, from Moncton, New Brunswick, to Winnipeg; the Grand Trunk Pacific, from Winnipeg to Prince Rupert; and the Canadian Northern, from Quebec to Vancouver. These important lines were added to the Intercolonial Railway, built by the Dominion Government to link the Maritime Provinces with Quebec and Ontario. The main transcontinental route of the C.N.R. runs from Quebec almost due west, well to the north of the Great Lakes, to Winnipeg. Thence the line crosses the prairies to Saskatoon and Edmonton, and, passing through Jasper National Park, crosses the Rockies by the easy gradients of the Yellowhead Pass (3700 feet), and follows the Thompson river, then the Fraser Valley south-west to Vancouver. From the Yellowhead Pass the old Grand Trunk Pacific route strikes along the Upper Fraser Valley, and down the Skeena Valley to Prince Rupert. There are important lines to Montreal, Ottawa, Toronto, and other towns of Eastern Canada, one route crossing the St Lawrence above Quebec by a gigantic cantilever bridge.¹ The most recent development of the Canadian National Railways is the Hudson Bay railway, 511 miles long, from The Pas² to Churchill, on Hudson Bay. The line was finished in 1930, its main purpose being the provision of a short rail and sea route for grain export.

When British Columbia entered Confederation, in 1871, she insisted on the construction of a transcontinental railway, to link her with Eastern Canada. By 1880 the

¹ See illustration, page 331

² See illustration, page 299.

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Government had made 700 miles of this railway, and then decided to hand over the construction to a private company. Thus began the Canadian Pacific Railway, which received free the sections already made, \$25,000,000 in cash, and 25,000,000 acres of selected land in the Fertile Belt. The main line of the C.P.R. was finished in 1885, thus providing the first Canadian link between Atlantic and Pacific. The real eastern terminus is Montreal, but there is connexion with St John, the ice-free port of New Brunswick, by a line through the state of Maine. The western terminus is Vancouver, 3367 miles away, the complete journey, St John to Vancouver, taking nearly six days by express train.

The construction of the C.P.R. was one of the greatest engineering achievements in history. From St John the line has to cross the wooded mountains of Maine to reach Quebec Province, and crosses the St Lawrence to Montreal by a fine bridge, 3657 feet long. Montreal has important C.P.R. works for making and repairing all kinds of rolling stock. From Montreal the main line follows the forested Ottawa Valley, through the Dominion capital, and along the northern shore of Lake Nipissing to Sudbury. In carrying the line along the north shores of Lake Superior the engineers met tremendous difficulties in the many mosquito-infested swamps and muskegs—lakes partially filled with soil and peat—that had been left by ice-sheets. After Sudbury the next important towns are Port Arthur and Fort William, on Lake Superior. Continuing westward, the line passes through forested country abounding in lakes, including the Lake of the Woods, and less than forty miles from Winnipeg the forests abruptly change to open level plains—the prairies. Here construction was easy, save for some delay owing to the spring floods of the Red river, and during the summer of 1883 an average of 3½ miles of track a day was laid. Winnipeg has the chief C.P.R. works¹ for the maintenance of the western section

¹ There are other repair works near Calgary.

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of the railway. From Winnipeg the main line runs west **through** Portage-la-Prairie and Brandon, in Manitoba, **then** Regina, capital of Saskatchewan, all in a flat, monotonous region, to Medicine Hat, Alberta. From Medicine Hat the line follows the Bow river to Calgary. West of Calgary begins the climb towards the Rockies, which are approached by the Bow River Valley, leading to Banff National Park. The Rockies presented a difficult problem. The line climbs and zigzags towards the Kicking Horse Pass (5350 feet), where *it* reaches its greatest height, about a mile above sea-level. The railway pierces the Great Divide near the Kicking Horse Pass by two spiral tunnels, constructed on the corkscrew principle to reduce the gradient. The first tunnel (3206 feet long) curves through almost two-thirds of a circle beneath Cathedral Mountain, and emerges forty-eight feet lower down. The track then turns east, crosses the Kicking Horse river (a swift, tumultuous tributary of the Columbia), and enters the second tunnel (2890 feet long), under Mount Ogden, where it emerges from a similar great spiral forty-five feet lower down, to cross the Kicking Horse river a second time, but westward. Ten miles below the Great Divide the C.P.R. rounds the base of Mount Stephen, which rises abruptly above Field to more than 8000 feet. Descending through the forested gorges of the Columbia river, the railway tunnels through the Selkirk Mountains, with their snow-clad peaks and great glaciers, by the Connaught Tunnel,¹ over five miles long, through Mount Macdonald. Descending the western flank of the Selkirks by great curves, the line again crosses the Columbia, which has flowed round the northern end of the mountains. A deep, narrow pass through the Gold Range takes the line into the valley of the Thompson river, and thence into the Fraser Valley, with its deep *canon*, whence the railway track is cut into the face of the cliffs, helped along by tall viaducts over yawning chasms, and tunnels through projecting spurs.

¹ First opened to traffic in 1916.

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importance. Aircraft are increasingly used for passengers, mails, and supplies to the more remote settlements. Aircraft have permitted more rapid exploration of the extensive northern regions; the wide range of vision of aeroplanes is invaluable in forest fire patrols and the enforcement of fishing regulations in coastal waters. Attempts are being made to exterminate the looper worm,



FIG. 75. THE NATURAL REGIONS OF CANADA

which does great damage to hemlock-trees, and grasshoppers, which destroy crops, by dropping from aircraft clouds of chemicals (arsenic and calcium) on the areas affected. Rapid surveys of little-known areas that would take years by older methods are being carried out by aircraft equipped with special cameras. Regular mails are carried by air between the cities of Eastern Canada, and between settlements in the Mackenzie Basin, while the mining camps of Northern Ontario and Quebec are linked by air, and the daily air service between Winnipeg and Calgary, with a northern link to Edmonton, has reduced

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by twenty-four hours the transcontinental mail service. There is a big scheme in hand for the development of commercial airways in co-operation with the railways.

NATURAL REGIONS OF CANADA

In such a vast country one may recognize many natural regions, but for the present purpose only the major natural regions will be adopted, as shown in Fig. 75. The Canadian Shield, an almost unpeopled region, whose resources are minerals, forests, and furs, is a gigantic wedge separating the fertile, well-developed plains of the Great Lakes and St Lawrence regions from the fertile and increasingly important Prairie Provinces and British Columbia.

Canada will be treated under the political divisions, within which will be described the various sections of the natural regions enclosed. Very few sections of Canadian provincial or even international boundaries are based on natural boundaries. Most of the boundaries follow parallels of latitude or meridians of longitude. Such arbitrary boundaries are generally made in regions that are undeveloped, practically unpeopled, and perhaps little known. The political maps of the United States and Australia reveal the same features as that of Canada.

EXERCISES

1. Reproduce diagrammatically the values of Canadian exports and imports given in this chapter (pages 258, 260, 263). Add explanatory notes.
2. Draw a sketch map to show the transcontinental railways of Canada, and add notes on their construction and the part they have played in the development of the country.
3. Compare the foreign trade of Canada with that of the United States.

CHAPTER XVI

NORTHERN CANADA AND BRITISH COLUMBIA

NORTHERN CANADA

YUKON TERRITORY and the North-west Territories, comprising the Districts, of Mackenzie, Keewatin, and Franklin, are a region of extreme climate; but careful exploration has shown that these lands, which constitute more than three-fifths of Canada, are by no means a barren wilderness. They are now being developed.

Yukon Territory. Yukon recalls the Klondike, where the discovery of gold in 1896 led to a frenzied invasion by thousands of adventurers, who suffered terrible hardships in the arduous journey through difficult country. To-day Yukon is easily reached by a combination of sea, rail, and river routes through magnificent scenery. From Vancouver, Victoria, or Seattle large steamers of the Canadian National and Canadian Pacific Railways travel north to Skagway (Alaska), through the Inside Passage—a long stretch of deep waters sheltered by the islands fringing the coast. The western coast of Norway, with the Inner Lead, and the coast in Southern Chile offer the only other sea passages of this kind. The journey from Vancouver to Skagway takes 3¹ days. From Skagway the narrow-gauge Yukon Railway climbs, with the aid of bridges and tunnels, through a deep gulch to the White Pass (2885 feet), following the famous "Trail of 'Ninety-eight" to the Yukon plateau beyond. Whitehorse (330), so-called from the 'white horses' that foam over the rocks of a near-by *canon*, is the terminus. From White Horse Rapids flat-bottomed stern-wheel steamboats sail down the Yukon river in summer to Dawson (reached in two

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days¹), the capital of Yukon. The Yukon river provides 2000 miles of navigation through Yukon Territory and Alaska, and is the chief means of communication. Dawson was the headquarters of the gold-miners, but its population is now less than 1000. Indeed, the population of the whole

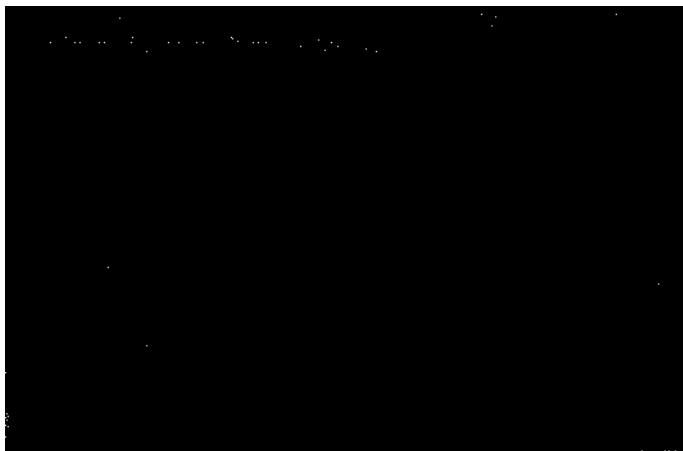


FIG. 76. DAWSON CITY, YUKON, LOOKING NORTH

The town is built at the junction of the Klondike river (coming from the right—the east) and the Yukon river, flowing north.

By courtesy of the Canadian Pacific Railway

territory is under 5000, as compared with over 27,000 in 1901. Dawson is joined to Whitehorse by a road, mainly used in winter. The complete journey from Vancouver to Dawson takes a week; the old gold-seekers spent months, even years, in reaching the same goal.

¹ The journey upstream against the current takes four days.

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Yukon was created a territory in 1898, the year of the gold rush, and is governed by a Gold Commissioner and a Council of three elected members. The country is almost wholly plateau crossed by lofty snow-clad ranges, including part of the St Elias Range in the south-west, and the Rockies, with numerous offshoots, in the east. The Yukon and its tributaries are frozen over during the greater part of the year. The rich water-power resources of Yukon are only developed on a small scale for the mining industry. The winters are long and cold, but dry, and relatively free from winds; the three or four months of summer are bright and warm, with little darkness, giving a rapid, though short, growing season. The average annual precipitation (both rain and snow) is 12 to 13 inches—about half that of South-east England. The northern part of Yukon is tundra, but elsewhere the valleys, hillsides, and lower plateaux carry splendid forests of spruce, balsam fir, jack-pine, cottonwood, poplar, and birch. Wood is largely used as fuel for domestic, mining, and steamboat purposes. There is a profusion of wild fruits and flowers, while such crops as wheat, oats, barley, hay, fruits, and vegetables are grown as far north as Dawson.

Mining is the chief occupation. Gold is still important, but is now mainly obtained by hydraulic mining—*i.e.*, by directing powerful jets of water on to the cliff faces, to wash down the ore—and by huge dredgers in the streams. Other metals are worked, including silver, copper, and lead. Coal is mined near Dawson, and used chiefly for the generation of electricity for the neighbouring mines.

Yukon abounds in fur-bearing animals (weasel, muskrat, lynx, wolverine, bear, otter, marten, mink, fox, wolf, coyote, and beaver), the Yukon silver fox being so highly prized that it is bred on fur farms. Big game is abundant, including moose, caribou, black, brown, and grizzly bears, sheep, and goats; the game birds include grouse and

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ptarmigan; the rivers and lakes are well stocked with trout, whitefish, grayling, salmon, and pike.

Perhaps the most hopeful feature in Yukon is the efficiency of the aircraft services now maintained between the various mining centres, and which may lead to a revival of the mining industry.

The North-west Territories. As from January 1, 1920, the North-west Territories are divided for administrative purposes into Mackenzie, Keewatin, and Franklin, governed from Ottawa by a Commissioner, Deputy Commissioner, and five Councillors. Mackenzie District is chiefly the greater part of the basin of the Mackenzie river, with its long tributaries and great lakes. Keewatin comprises the flat plains north-west of Hudson Bay, and all the islands within the Bay. Franklin District consists of all islands north of the mainland, together with Melville Peninsula, and Boothia Peninsula, where lies the Magnetic Pole. East of Great Bear and Great Slave Lakes there is a section of the Canadian Shield, including Baffin Island and others north of it, rocky, uneven, largely denuded of soil, and, in general, treeless. West of this region lies the Mackenzie lowland, of limestones, sandstones, and shales, forming a monotonous plain, dotted with lakes, swamps, and shallow valleys. The islands to the north are similarly of softer and younger rocks than those of the Shield. The whole region has been heavily glaciated, and a few areas of permanent ice remain, chiefly on Baffin Land and Devon and Ellesmere Islands. Climatic conditions resemble those of Yukon. Chinook winds are felt in South-west Mackenzie. The winter snowfall is not heavy, but bitterly cold winds are frequent in the north. Mackenzie has forests like those of Southern Yukon, but nearly all Keewatin and the whole of Franklin are treeless, save for willows and other shrubs. White spruce is the most valuable tree. To the north the forest belt changes to a region of stunted trees, and passes into the tundra, a region known for over 150 years as the Barren Grounds—a misleading name, in view of the pro-

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lific plant life. Even on Ellesmere Island, within 500 miles of the Pole, there are over 125 species of flowering plants and over 500 species of mosses, lichens, fungi, etc. The name Barren Grounds has now been officially changed to Northern Plains. This region and its Eskimo peoples have been described in Chapter IV. The only other inhabitants are fur-traders, trappers, missionaries, Royal Canadian Mounted Police and other officials, and prospectors, and none of these is really a permanent inhabitant. There are Eskimos, Indians, whites, and half-breeds in the North-west Territories, the total population being 9723.

Bison, moose, caribou, and musk-ox are found, besides the fur-bearing animate already mentioned in the account of Yukon. Indeed, furs have long constituted the only export of the North-west Territories. Indian and half-breed trappers bring the furs to the trading-posts. The whaling trade of the nineteenth century has practically ceased with the almost complete destruction of the whales, but seals and walruses are still plentiful. Fish and birds are abundant. In the interests of wild life and the welfare of the natives four preserves, totalling over 500,000 square miles, have been set aside, where all trading is strictly controlled. The North-west Territories are approached from Halifax, St John, Montreal, and other eastern ports by way of Hudson Strait, or Davis Strait and Baffin Bay. As yet there are no regular sailings. The new Hudson Bay route from Churchill will assist in the development of Keewatin. Traffic in the interior of the Territories is almost wholly by the waterways, of which the Mackenzie is the chief. A railway from the Athabaska river gives direct connexion with Edmonton, Alberta, and other railways will probably be carried far north into the Territories themselves. Aircraft (equipped with floats) for rapid exploration, for prospecting for minerals, and for general commercial purposes have done more to make possible the development of the Territories than any other factor.

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The most important Territory is Mackenzie. The Mackenzie river, which is the largest in North America, excepting only the Mississippi, is a majestic stream, over a mile wide, and with a strong, steady current. At intervals along its course there are trading-posts, such as



FIG. 77. DELTA OF THE MACKENZIE RIVER

The delta is over one hundred miles in length, and fifty in breadth. The low alluvial flats are only a few feet above high-water level, enormous loads of silt are being deposited, and the channels are continually shifting. The forests gradually disappear about half-way to the sea, and thick growths of willows abound.

By courtesy of the National Development Bureau, Ottawa

Fort Smith (the headquarters of the District Agent for the North-west Territories), Simpson, and Norman. Motor-boats and shallow-draught, stern-wheel steamboats (burning wood fuel) can navigate from Fort Smith, on the southern boundary, right to the Arctic coast. Canoes are employed to traverse the branch waterways. Wheat, oats, barley, potatoes, and other vegetables and small fruits are grown with varying success in the southern half of

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Mackenzie District, and the production of more suitable varieties will lead to important agricultural developments. Grazing-lands and forests are other resources, and there are possibilities of water-power development. The great mineral wealth is undeveloped, but includes petroleum, coal, zinc, lead, gold, and copper.

No account of the North-west Territories would be complete without a tribute to the work of the Royal Canadian Mounted Police. Less than one hundred of these picked men maintain law and order and carry out a multitude of other duties in a territory ten times the size of the British Isles. Their long patrols in both summer and winter are a means of supervising and helping the natives, trappers, and traders, and also furnish further information about little-known regions.

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The Spanish conquerors extended their control as far north as California on the Pacific coast, but no attempt was made by any people to settle in what is now British Columbia before Captain Cook had refitted his vessels in Nootka Sound, on the west of Vancouver Island, in 1778. His glowing reports of the wealth in fur-bearing animals attracted many fur-traders. Fur-trading posts were established at various points, including Fort Victoria in 1843. In 1846 the Oregon Treaty fixed the boundary between British and United States territory on the forty-ninth parallel on the mainland, and midway along Juan de Fuca Strait. Vancouver Island (called after Captain George Vancouver, who made extensive explorations in the late eighteenth century) was created a Crown Colony in 1849, although it was leased to the Hudson's Bay Company, and Fort William became their western depot. The finding of gold in the Fraser and other valleys led to a rush in 1858 of over 20,000 adventurers (mostly from California) into Victoria, and very soon cities sprang up on the main-

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land. In August 1858 the mainland (hitherto called New Caledonia) was created the Colony of British Columbia. Settlement proceeded slowly, and in 1866 the two colonies were united under the name of British Columbia, with Victoria as capital. Some of the inhabitants wished to maintain a separate colony; others desired union with the Dominion of Canada; United States citizens, who were numerous, agitated for annexation by the United States. At length, however, British Columbia entered the Confederation on July 20, 1871. At this time there were 36,247 people in the Province, of whom 10,000 were whites, the rest being Chinese and native Indians. In 1901 there were 178,657, and the population in 1931 was 694,000, about 80 per cent, of splendid Anglo-Saxon stock. There are also a good number of Chinese, Japanese, and native Indians. Most of the Indians live in special reserves under the care of Government officials, and the majority use European dress. The coast peoples live mainly by fishing, usually for a salmon cannery, or by working in the canning-sheds. In the interior farming is their chief mode of life. Grain, fruits, and vegetables are grown, farming machines being commonly used, and horses and cattle are reared. Only in the remoter parts are there nomadic natives dependent on hunting and fishing. In the late nineteenth century thousands of Chinese immigrants took up such occupations as salmon-canning and market-gardening. With the object of restricting their numbers a tax of 500 dollars a head was imposed in 1904, and in 1923 further immigration was forbidden by law. Japanese settlers began to come in greater numbers after the Russo-Japanese War of 1904-5, but in 1908 the Canadian Government made an agreement with Japan whereby only a strictly limited number of Japanese are admitted by special passports.

British Columbia corresponds very closely with Britain in latitude, and in position on the west of a continent, facing an ocean; but British Columbia has an area equal

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to a combination of the United Kingdom, France, Belgium, Holland, and Denmark. The Pan-handle of Alaska shuts off the northern section of British Columbia from the Pacific. The main feature lines trend north-west to south-east. The whole country consists of parallel ranges—Rockies, Selkirk, Gold, and Caribou in the east, Coast Range in the west—with valleys, lake-basins, and plateaux between them, drained by many rivers. The coast is indented with mountain-girt fjords and fringed with islands, including Vancouver and the Queen Charlotte group, so that there are numerous excellent harbours and sheltered, deep-water channels. The Liard and Peace rivers, in the north, are long tributaries of the Mackenzie. The other rivers drain to the Pacific, after flowing in longitudinal valleys and cutting transverse valleys—very important in east and west communications—through the various ranges. The chief Pacific rivers are the Stikine and Skeena in the north, and the Fraser and Columbia in the south. All these rivers can be navigated in some sections, but the majority of the rivers are swift, with falls, rapids, and *canons* in their courses. In the ice-deepened valleys there are hundreds of lakes. Steamships ply on several of the larger lakes.

The climate resembles that of Western Europe. In the coastal belt and islands the prevailing westerly winds slightly cool the summers, greatly warm the winters, and bring abundant rainfall, especially in winter and on the mountains. The sheltered valleys have colder winters and in many cases deficient rainfall, so that irrigation is necessary for agriculture. The valleys and mountain slopes are clothed with splendid forests. Above the tree-line there are Alpine pastures with many brilliant flowering plants, reaching almost to the snow-line. The drier inland valleys have scattered yellow pine-woods and bunch grasses. The long growing season, mild temperature, and abundant rainfall of the Coast Range have caused the trees to reach gigantic dimensions, while the undergrowth is luxuriant.

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The great natural resources are forests, minerals, agriculture, and fisheries.

The durable Douglas fir, valuable for heavy construction, supplies nearly half the timber cut; cedar, remarkable for its weather-resisting properties, supplies another quarter; of other timbers the chief are hemlock, spruce, and pines. The general practice is to convey the logs by



FIG. 78. TRANSPORTING LUMBER BY RAIL, BRITISH COLUMBIA

By courtesy of the Canadian Pacific Railway

special railways to tidal waters, where steam tugs tow them to saw- and pulp-mills. About half the value of production is lumber, and about one-sixth is pulp and paper. In recent years half the export of lumber has gone to the United States, other importers being (in order) Britain and Europe, Japan, Australia, and China. Much lumber is shipped *via* the Panama Canal to the Atlantic states and provinces.

In value of Canadian mineral production British Columbia, with 15 per cent, of the total, ranks second to Ontario.

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The mountains contain a great variety of minerals, the chief, in order of value, being as follows: *

MINERALS	CHIEF PRODUCING AREAS
Gold . .	North of Prince Rupert
Lead . .	North of Rossland
Zinc . .	North of Rossland
Coal . .	Vancouver Island; Crow's Nest Pass; east of Vancouver
Silver. .	North of Rossland; north of Prince Rupert
Copper .	Near Vancouver; north of Prince Rupert

Of Canadian output British Columbia produces nearly all the lead and zinc, nearly half the silver and copper, over one-eighth of the coal, and nearly one-fifth of the gold.

The growing of crops and rearing of animals began round the fur-trading posts, and was encouraged by the demands of the miners. An area equal to that of Belgium and Holland is available for agriculture, but of this only one-twenty-eighth is cultivated. The farming lands are cut off from each other by mountain ranges, and practically all the land developed is within easy reach of railways. Fruit-growing, with irrigation in the drier areas, is very important in the warm, sheltered valleys of the south, such as those of Okanagan, West Kootenay, Lower Fraser, and South Vancouver Island. The chief fruits are apples, cherries, pears, plums, prunes, apricots, and peaches. Co-operative marketing is general, and in many districts there are factories for canning and preserving fruits, and making jam or cider. Exports (the principal fruit being apples) are increasing, mainly to Britain and Europe, the Far East, and Australia and New Zealand, besides supplies sent to the Prairie Provinces. Stock-raising is growing in importance on the rolling plateau grasslands, where cattle, horses, sheep, and goats are reared. Dairy produce, especially milk and butter, is also

¹ Taking the average figures for 1935 and 1936. In recent years there has been a great increase in gold output and a decline in copper.

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increasingly important in the south. Mixed farming is well established, and hay, wheat, and root crops are grown as fodder.

The coastal and river fisheries are very important. Salmon are more valuable than all the rest put together, and in 1936 there were forty-three salmon canneries as well as many salmon dry-salteries, canned salmon being



FIG. 79. A SALMON CANNERY AT PRINCE RUPERT,
BRITISH COLUMBIA

The salmon are generally brought to the cannery in a rectangular wooden boat, called a scow.

By courtesy of the Canadian National Railways

shipped to ninety-three countries. The chief workers in the canneries are Chinese and native Indians. The danger of extinction of salmon in the Fraser river system by unrestricted fishing was finally removed by a treaty of 1930 between Canada and the United States, whereby the International Pacific Salmon Fisheries Commission, with three members from each country, has complete control over the whole industry. Halibut is next in importance to salmon, the chief fishing-grounds lying between Queen

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FIG. 82. VICTORIA, CAPITAL OF BRITISH COLUMBIA

centre), and Juan de Fuca Strait in the distance.

By courtesy of the Royal Canadian Air Force

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couver Island, is a port with considerable coastal trade, but is chiefly important as the capital of British Columbia. It is a residential city of splendid buildings. Three miles away lies the fine harbour of Esquimalt, a fortified naval station with a big dry dock and repair yard. Nanaimo



FIG. 83. PRINCE RUPERT, BRITISH COLUMBIA

Railways come right to the coast, so that loading and unloading of ships may be quickly carried on. The coastal plain is of small extent.

By courtesy of the Royal Canadian Air Force

(6700), north of Victoria, is a coal port, and the headquarters of the herring fisheries.

New Westminster (17,000), twelve miles up the Fraser from the sea, is the centre of a rich farming district, and has important salmon canneries. It is growing in importance as a port, and has a big elevator. Prince Rupert (6300) is a terminal port of the Canadian National Rail-

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ways, and the headquarters of halibut and other fisheries. Its fine harbour is well equipped with wharves, floating dock, repair yards, grain elevator, and cold-storage plant for fish. A few miles south are the important salmon canneries of the Skeena river.

EXERCISES

- i. Estimate the possibilities in the future development of Yukon and the North-west Territories.
2. Draw a large map of British Columbia, and record upon it as many important geographical facts as possible.
3. Give an account of the salmon fisheries of Western North America.

CHAPTER XVII

THE PRAIRIE PROVINCES

THE Prairie Provinces, Alberta, Saskatchewan, and Manitoba, are separated from British Columbia by the Rockies, and from Eastern Canada by the southernmost part of the Canadian -Shield. They consist of part of the Canadian Shield in the east, including part of the limestone Hudson Bay Lowlands, and the Great Plains in the west. In the north the three provinces include a large part of the Canadian coniferous forests, while their southern part (from about the fifty-fifth parallel) is prairie-land, continuous with that of the United States. The prairies rise gradually to the foot of the Rockies in three great steppes, or levels, all covered with glacial soils. The first prairie steppe (about 800 feet above sea-level) includes the Red River Valley and the Winnipeg system of lakes—the whole region forming part of the flat bed of the former glacial Lake Agassiz. The second prairie steppe has an average elevation of over 1500 feet, and covers much of Saskatchewan. The third prairie steppe is the biggest, stretching right across Alberta to the foothills of the Rockies. This steppe is more hilly than the others, and has an average height of 3000 feet. The eastern edges of the second and third steppes are marked by escarpments. As the general slope is to the east and north the Prairie Provinces are chiefly drained to Hudson Bay, by the Churchill and Nelson river systems. The Peace and Athabaska rivers drain the northern half of Alberta to the Mackenzie, and so to the Arctic Ocean. The Prairie Provinces are the great grain producers of Canada, wheat being of paramount importance.

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ALBERTA

Alberta, which was created a province in 1905, has an area more than twice that of the British Isles. The population in 1901 was 73,022; in 1931 it was 727,497.

Southern Alberta, which includes the foothills of the Rockies, is a rolling plateau of treeless prairies, merging



FIG. 84. CATTLE RANCH, WITH HEREFORD CATTLE,
SOUTHERN ALBERTA

Note the rolling, grassy plains, devoid of trees, the well-constructed farm buildings, and the dwelling-house in its enclosed garden.

By courtesy of the Natural Resources Intelligence Service, Ottawa

into forests on the north. This is still a great ranching country, where cattle, sheep, and horses graze on scattered, but nourishing, grasses. The sun dries up the grasses in late summer, producing standing crops of excellent hay, while the comparative mildness of winter and general absence of snow—thanks to the Chinook winds—allow the cattle and horses to live out on the prairies. Additional fodder is obtained by cutting prairie

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hay, and growing crops of alfalfa, grain, and vegetables are secured by irrigation. Ranches are usually large, as the cattle require wide grazing areas. The absence of fences, especially in the foothills, allows the animals to roam about, and it is necessary at intervals throughout the year to have organized round-ups, conducted by skilful cowboys, with the objects, for example, of sorting out the various herds, branding the calves, or selecting the cattle for slaughter. Alberta cattle are famous for their beef.

The steady westward march of the grain belt has already converted many of the old ranches into lands of grain and mixed farming, dependent in many areas on irrigation, in others on dry-farming. Alberta in recent years has produced three times as much wheat as Manitoba, besides much greater quantities of oats. In Central Alberta there is a belt of very fertile black loam, which yields heavy crops of wheat, oats, barley, rye, and flaxseed. Mixed farming is general, and near Edmonton dairying is important mainly for butter. Pigs are also important in many areas. Timber resources—poplar, spruce, pine, birch, and cottonwood—increase in importance towards the north, supplying many saw-mills, and a valuable fur trade is still carried on in the far north. Railways from Edmonton to points on the Peace and Athabaska rivers are helping to open up the north, where the mildness of the climate, aided by the Chinooks, permits the growth of special, quick-ripening, hardy varieties of wheat, despite the short summer.

Alberta has great mineral wealth, particularly in coal—bituminous, lignite, and anthracite—and its mines produce half the coal of Canada, and contain over 80 per cent, of the country's reserves. The coal is widespread in the southern half of the province. Large supplies of natural gas are available at many points, and are used for power, fuel, and light. South of Calgary is the Turner Valley oil-field, which is the most productive in Canada. In the McMurray district of the middle Athabaska Valley there are huge deposits of bituminous sands, containing

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15-18 per cent, of bitumen (tar). Mills for flour, oatmeal, cement, and linseed oil; packing-houses for pork and beef; factories for metals, glass, wood, clothing, and biscuits; oil-refineries and railway repair shops are the chief manufacturing establishments of Alberta, whose leading exports are grain, livestock (often sent by rail to Eastern Canada for fattening), meat, wool, fish (from the lakes and rivers), butter, eggs, and products from the mines and forests.

West of Calgary the Rocky Mountain Park (about half the size of Wales), centred on Banff, and Jasper Park, west of Edmonton, have been set aside for the preservation of forests and wild life, and as recreation areas. Over 6000 bison are preserved in special parks.

Edmonton (79,000), the capital of Alberta, is finely situated on a small plateau 200 feet above the North Saskatchewan river. As the junction of important railways it is a big distributing centre, and dispatches coal to the provinces east of Alberta. There are large flour-and saw-mills, meat-packing plants, butter factories, and oil-refineries, and the city is a leading fur depot of the Hudson's Bay Company.

Calgary (84,000), in the valley of the Bow river, is the chief business city of Alberta, and an important railway centre, with industries similar to those of Edmonton. It is also a big market for livestock and wheat.

Lethbridge (13,000) stands in a coal district, and is the centre of rich farming country, with extensive irrigation. Medicine Hat (10,000) is another agricultural centre, with industries of flour-milling, bricks, and sewer-pipes.

SASKATCHEWAN

Saskatchewan is a little smaller than Alberta. It was established from part of the old North-west Territories in 1905, and now has a population of 921,800, which is about that of Liverpool. The province takes its name from the river Saskatchewan, an Indian name meaning

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rushing^water/ Saskatchewan includes parts of the second and third prairie steppes, and is a land of undulating plains, largely covered with eight to twenty inches of exceptionally rich loam, resting on a clay subsoil—an important advantage in a region of light rainfall. The North and South Saskatchewan rivers and the Churchill drain most of the province to Hudson Bay. The prairies pass north into park-lands, where coppices of birch and poplar provide useful fuel and shelter from winds. The severe winters are marked by still, dry, clear weather, and the snow is rarely deep. Rainfall is sufficient for agriculture, although irrigation is necessary in a few areas in the warmer south, and there is abundant sunshine.

Saskatchewan has had an astonishingly rapid growth during its brief existence as a province. Among Canadian provinces it is third in population, second in agricultural wealth, first in production of wheat, rye, oats, flaxseed, barley, and horses.

The northern two-thirds is a land of lakes and rivers, teeming with whitefish, sturgeon, pike, and trout, important for home supplies, and increasingly exported. The extreme north is a section of the Canadian Shield, sparsely covered with brush growth, and containing valuable minerals—iron, copper, nickel, lead, zinc, gold. This area is being mapped in detail, and, with the help of branch railways and abundant water-power, at present only used on the Churchill river, rapid developments are assured. Huge stores of timber and pulp-wood in the forest belt on the south are at present little developed. Fifteen timber reserves have been set aside, and also an extensive area of forest and lakes has been preserved as Prince Albert National Park.

The southern part of the province, "a country of open spaces, of undulating prairie, a park-like land of great fields and stretches of timbered ground interspersed with small lakes and streams and areas of marsh,"* is a highly

¹ Official booklet of the Province of Saskatchewan.

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developed agricultural area, where mixed farming is increasing, in a region once wholly dependent on grain. Saskatchewan is the greatest grain-producer in Canada, thanks to its fertile soils and a climate that enables wheat to grow quickly. It should not be forgotten that the summer days provide longer periods of sunshine than are experienced in lands farther south. Wheat is easily the most important grain, Saskatchewan producing more than half the Canadian crop. Oats of excellent quality rank next, and about three-quarters of the Canadian flax-seed is grown in the province. Barley is grown partly for export, but chiefly for feeding cattle and hogs. Alfalfa (mainly in irrigated districts), potatoes, and rye are also important. Horses (one-third of the Canadian total), cattle, swine, and poultry are reared in great numbers, and sheep-ranching is still important on the western plains. Dairy-farming, greatly assisted by Government creameries, has grown remarkably in recent years, and half the butter is exported. Poultry products are also important. Co-operative marketing is highly organized and very successful.

The mineral wealth of the north has yet to be exploited, but the southern third of the province already produces considerable quantities of coal, clays (for bricks, red pottery, or porcelain), sodium sulphate (an alkali used in the form of saltcake as a substitute for sulphuric acid in the metal and paper-manufacturing industries), volcanic ash (used as a cleaning and polishing powder), limestone (excellent for buildings), and other minerals. The coal is easily mined at ten or twelve feet depth; in some areas great steam-shovels remove the surface layers, and smaller shovels remove the coal itself.¹ The coal is lignite, containing so much moisture that it is generally dried, pulverized, and then compressed into briquettes.

Regina (53,000), on the main line of the C.P.R., is in the centre of rich agricultural lands. As capital of the

¹ See the photograph of the Colstrip Mine, page 206.

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province it possesses the fine Legislative Buildings. Moose Jaw (21,000), west of Regina, has extensive stockyards and flour-mills and a great elevator.

Saskatoon (43,000), on the South Saskatchewan river, is an important railway and collecting centre, and also has a big grain elevator. Prince Albert (9900), on the North Saskatchewan river, is important for its saw-mills, flour-mills, and fur trade.

MANITOBA

Manitoba, originally known as the Red River Settlement, was made a province in 1870. Since then its area has been made eighteen times as large, and its population has increased thirty-fold. It is the central province of Canada, and the only Prairie Province with a sea-coast. The population of 700,100 includes 15,400 Indians, living on reserves by hunting, trapping, or fishing. For two centuries prior to the creation of the province the country was associated with the Hudson's Bay Company, and furs were the only product of importance. The earliest attempt at land settlement and agriculture was the Red River Settlement of the Earl of Selkirk, who established colonies^x (mainly of northern Scotsmen) in 1812-15. The population steadily increased by the addition of retired fur-traders, French-Canadians, half-breeds, and others, but modern progress did not begin until after 1870. The population in 1871 was 25,200; in 1891 it was 152,500. Between 1901 and 1916 it grew from 255,200 to 553,800. Nearly 60 per cent, are British, and another 18 per cent. French, German, Scandinavian, or other North-west European peoples. Waterways provided the chief means of communication in the fur-trading days, and rapid development was not possible until the construction of the C.P.R.

The land north and east of Lake Winnipeg is a low-lying

¹ There were only about 300 people all told, including women and children.



FIG. 85. TOWN OF THE PAS, MANITOBA

The Pas (3200), on the right bank of the Saskatchewan river, is the headquarters of the forest, fishing, mining, and fur-trapping industries of Northern Manitoba and the starting-point of the Hudson Bay Railway to Churchill. The scenery is typical of Northern Manitoba.

By courtesy of the Royal *Canadian Air Force*

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part of the Canadian Shield, with a section of the Hudson Bay Lowlands. The rest of the province consists of the first prairie steppe. Manitoba is drained to Hudson Bay by the Nelson river system, which includes Lakes Winnipeg, Winnipegosis, Manitoba, and others, and the Churchill system, which also includes many lakes. Lake Winnipeg alone is much larger than Wales. Into it from the south flow^rs the important Red river, with its long tributary, the Assiniboine; the rapids and falls of the Winnipeg river, from the east, supply power, while the northern end of the lake receives the great Saskatchewan river.

South-east Manitoba is among the most fertile areas in the New World. The soil of the Red River Valley will produce good crops for many years without additional fertilizers. The north and east have some good soils, but most of the land is stony, swampy, or peaty. Between the Churchill and Nelson rivers the Hudson Bay Railway traverses a clay belt that holds great possibilities for farming. The climate of Manitoba is similar to that of Saskatchewan, but more extreme, the mean temperature range being about 70° F. Cold snaps in winter and hot spells in summer are common. There is an annual precipitation of about 20 inches, of which about 15 inches fall as rain (mainly in the growing season, and frequently in thunderstorms) and the remainder as snow.

The Canadian Shield belt that forms two-thirds of Manitoba is of little use for agriculture, but nevertheless its resources are great. Forests of spruce, aspen, pine, and birch provide fuel and supply many saw-mills. The industry is small, but capable of great expansion in connexion with paper-making. Of the mineral wealth only copper and gold are being developed on any scale. Other parts of the province produce limestone (for building, road-making, and cement-making) and gypsum. Fish (chiefly pickerel and whitefish) from the big lakes at present have a greater market value than the timber production, large supplies being sent to the United States.

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Furs are still important, and there are nearly a hundred fur farms. Wild game is plentiful, and includes moose, wapiti deer, and caribou. The Nelson, Churchill/ and other rivers are capable of extensive power developments.

The southern third of Manitoba is the most productive and best developed part. Of the area suited to agriculture (one-sixth of the province) only one-third is under cultivation, mainly of grain. In production of wheat, oats, and animals Manitoba is surpassed by the other Prairie Provinces, but generally it takes first place in barley production. A large proportion of the oats and barley is used as animal fodder. Mixed farming has steadily increased, the raising of beef cattle, sheep, pigs, poultry, and bees, the production of dairy produce, and the growing of vegetables, alfalfa, clover, and (more recently) fruits, being notable additions to grain cultivation. Thanks to the abundance of raw materials, labour supply, water-power, and transport facilities, the manufacturing industries of Manitoba are developing rapidly. The leading industries are meat-packing, flour-milling, railway rolling-stock, butter and cheese, and electricity.

Manitoba has the latest addition to Canada's chain of national parks. Riding Mountain Park (opened in the summer of 1931) covers an area five times that of the Isle of Man. It is a well-timbered, hilly country, with a number of beautiful lakes.

Winnipeg (219,000), the capital of Manitoba and third city of Canada, began as a Hudson's Bay Company's post—Fort Garry—in 1870, and when the city was incorporated in 1873 it contained only 1869 people. Winnipeg has grown so rapidly because of its position at the junction of the Assiniboine and Red rivers, forty miles south of Lake Winnipeg, sixty miles north of the United States boundary, and almost midway between the Atlantic and Pacific coasts. All traffic between Western and Eastern Canada must pass through this 100-miles-wide corridor, and in consequence Winnipeg has become the greatest

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grain centre in America, the chief railway centre of Canada, and the financial, commercial, wholesale, and manufacturing centre of the Prairie Provinces. Winnipeg is the livestock market for the cattle of Western Canada. The St Boniface Stockyards, two miles away, opened by the

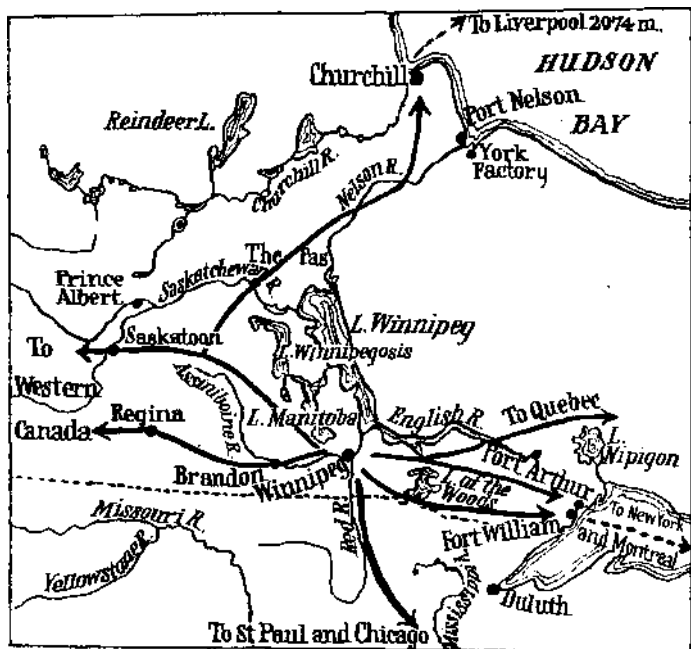


FIG. 86. THE POSITION OF WINNIPEG

The principal traffic routes are indicated.

two great railway companies in 1913, have given Winnipeg a supremacy comparable with that of Chicago. The cheap hydro-electric power of the Winnipeg river is employed for domestic and industrial needs, and the city has important industries of flour-milling, meat-packing, railway stock, farm implements and machines, leather goods, etc. St Boniface (16,000), standing on the Red river opposite

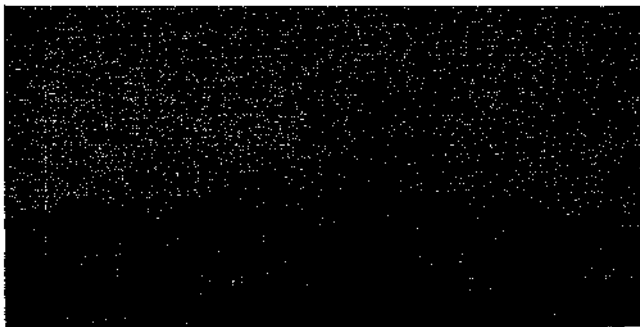


FIG. 87. WINNIPEG IN 1870

Copied by D. C. Sadler. Reproduced by courtesy of the Empire Marketing Board

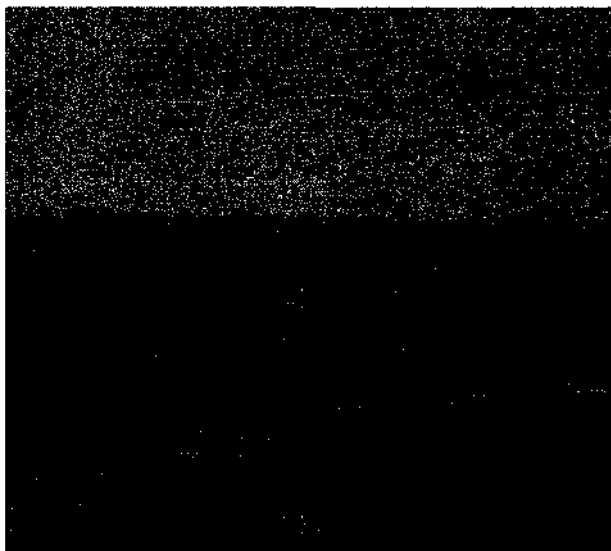


FIG. 88. A GENERAL VIEW OF WINNIPEG

A striking contrast with Winnipeg in 1870. Winnipeg is the gateway to Canada's
"Thousand Mile Farm."

By courtesy of the Canadian National Railways

NORTH AMERICA

Winnipeg, is in the main a city of French-speaking Roman Catholics. Its industries resemble those of Winnipeg, animal-slaughtering and meat-packing being noteworthy.

Brandon (17,000), on the Assiniboine, 133 miles west of Winnipeg, is the centre of a rich farming region. It has grain elevators, flour-mills, creameries, and factories for

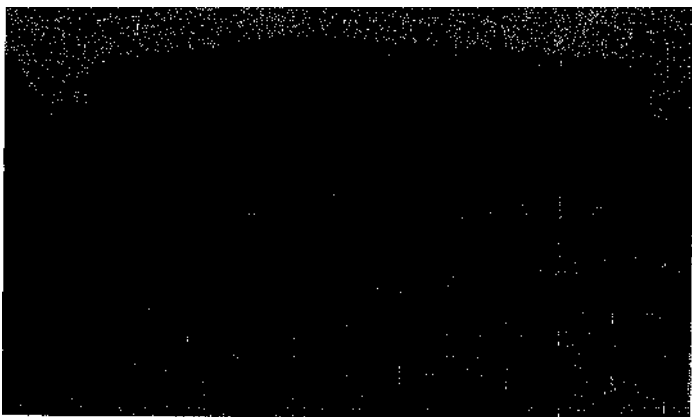


FIG. 89. THE HUDSON'S BAY COMPANY'S STORES, WINNIPEG

The Hudson's Bay Company is not merely a fur-trading company. It has large general stores—after the type of Selfridge's—in most Canadian cities of any size. On the left of this picture can be seen the Parliament Buildings of Manitoba.

By courtesy of the Governor and Committee of the Hudson's Bay Company

farming machines, and is an important collecting and distributing centre. Portage-la-Prairie (6600) is another wheat centre nearly half-way between Winnipeg and Brandon.

THE GRAIN TRADE

The level, treeless prairies, with their fine, friable soil, have encouraged farming on an extensive scale, with the use of machinery and the large-scale production of wheat. The climate of the Prairie Provinces enables wheat to

THE PRAIRIE PROVINCES

grow quickly, but the grain must be harvested before the autumn frosts damage it—hence the importance of varieties that ripen earlier, and permit an extension northward, where the summer period is shorter. Nearly all the wheat is spring sown.¹ Only in favoured parts of Alberta does the Chinook wind permit the growth of autumn-sown



FIG. 90. PETROL-DRIVEN TRACTORS PLOUGHING THIRTY FURROWS
AT ONCE

An example of modern machine-farming on the prairies. Each tractor ploughs six furrows. Note the arrows on the left of the front tractors, enabling the drivers to keep in line.

By courtesy of the Canadian Pacific Railway

wheat. About 1870 the original varieties of wheat grown in Canada began to give place to the famous Red Fife, so called from the reddish colour of its ripe kernel and the name of the Ontario farmer, Donald Fife, who discovered it accidentally among some seeds from Europe in 1842. Red Fife has been completely replaced by Marquis wheat, bred on the Central Experimental Farm, Ottawa, by Dr Charles E. Saunders, in 1903. Marquis

¹ See page 224.

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ripens ten days earlier than Red Fife; it is hardy, gives a heavy yield, and its hard, dry grain yields an excellent flour for bread-making. Other varieties¹ are being evolved, and there are improved types of barley, oats, and other cereals.

Towards the end of April, when as a rule the snow has disappeared and the ground has dried sufficiently, the farmer sows his seed by machines. The grain needs no further attention until harvest-time, which is generally early in August.

Four-horse binders of eight-foot cut flash their reels over the great expanses of golden grain, and from sunrise till sunset circle round and round the steadily diminishing field. Great areas of sheaves lie waiting the stookers, whose duty it is to stand them erect in little sets, making the familiar stooks. After a few days drying in the stook, if the weather is favourable, the grain is ready to be threshed. . . . The threshers gather the sheaves on wagons and drive them to the machine, which is conveniently placed in the field. Other teams drive the threshed grain directly from the machine to the nearest elevator; or it may be stored in granaries in the fields or at the farmstead.²

•All this work demands more help, and special trains bring additional workers from Eastern Canada. Besides steam-engines and motor-tractors, teams of horses, four, five, or six for the smaller machines, perhaps over thirty for the big combination harvesters, are common. Year by year mechanically driven machines are performing more and more of the work, and reducing the number of farm workers required. A machine called the swather has been widely introduced. It cuts the crop and leaves it in long rows, or swaths, unbound. After a few days drying it is picked off the ground and threshed by an

¹ * Garnett' and * Reward' are two new varieties of which great hope? are entertained.

² From *Manitoba*, published by the National Development Bureau, Ottawa, 1931.

THE PRAIRIE PROVINCES

engine-drawn thresher. The latest introduction is the combined harvester and thresher.

Once the wheat has been harvested there arises the great problem of dispatching it to markets, the chief of which—Great Britain—lies 5000 miles away over land and ocean. Throughout its long journey the wheat is



**FIG. 91. A COMBINED HARVESTER-THRESHER WORKING
ON THE PRAIRIE**

These huge machines cut and thresh the crops in one operation. The wagon is being filled with grain from the big container.

By courtesy of the Canadian Pacific Railway

kept loose, so that it may be poured out rapidly. Belt conveyors and powerful suction are employed in moving the grain to and from the elevators.¹ From small storage elevators at the railway-side the wheat is taken in freight-cars to one of the great collecting centres, Winnipeg being by far the most important, where it is stored in great elevators. From Winnipeg the wheat may be exported

¹ In 1900 there were in Canada 523 elevators with a capacity of 18,300,000 bushels. In 1936 5870 elevators, with a capacity of 420,644 000 bushels.

NORTH AMERICA

by various routes. The great bulk goes by rail to Port Arthur and Fort William, to be stored again in elevators, before being poured out into lake steamers. A larger quantity of Canadian wheat is normally exported through New York, reached from Buffalo by the Mohawk-Hudson

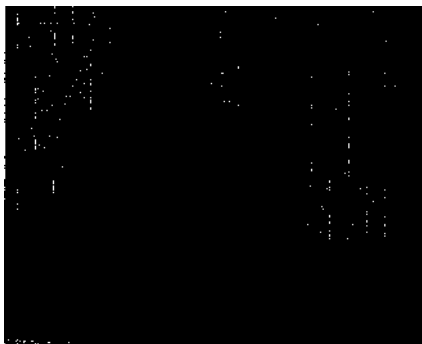


FIG. 92. GRAIN ELEVATORS ON THE PRAIRIE

These are the small elevators in which grain is stored before going to the ports. Note the pipe on the nearest elevator, through which the grain is poured into the freight-cars.

By courtesy of the Canadian National Railways

route (chiefly rail), than by the all-water route through Montreal. The rail transport to New York costs more, but New York has better steamship services, lower ocean rates, and lower insurance rates, since the ships avoid the fogs and rocks of the St Lawrence estuary. Smaller quantities are exported through St John, Portland (Maine), and Halifax—harbours that are ice-free in winter.

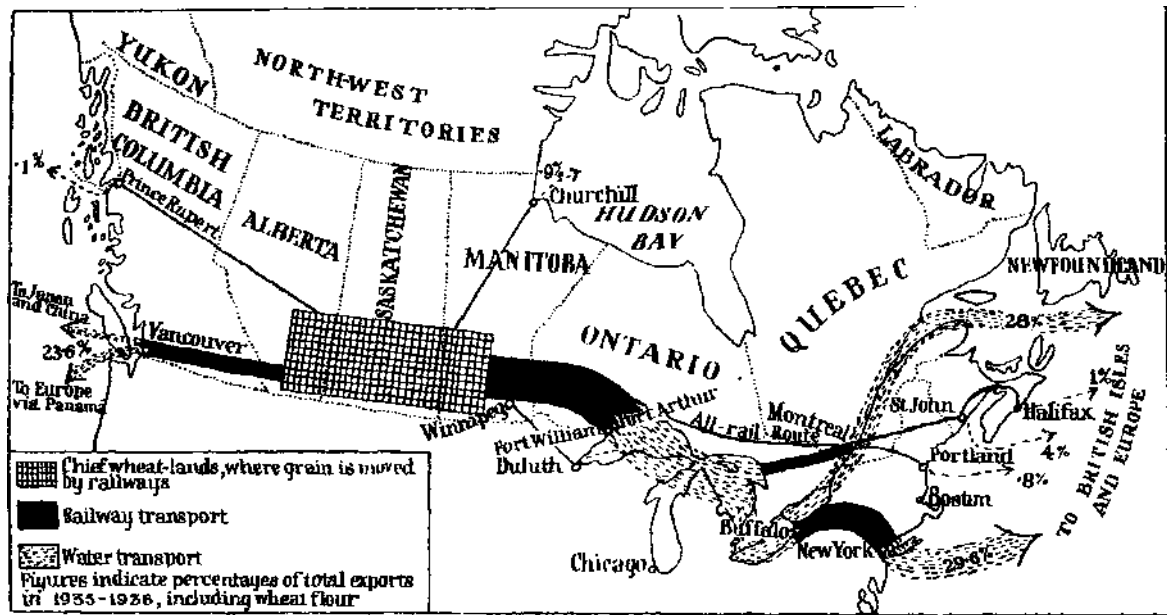


FIG. 93. THE EXPORT OF CANADIAN WHEAT

In addition to the exports recorded in the map, about 12 per cent, of the total went to the United States for consumption. In recent years there has been a tendency for a larger percentage of overseas export to pass through the St Lawrence ports and through Vancouver. Churchill, on Hudson Bay, offers a short route to Liverpool; this was opened in 1931.

NORTH AMERICA

The rapid increase in the amount of wheat exported through Vancouver has already been mentioned. This route has the advantages of a snorter train journey from the chief wheat area, and more convenient access to Far Eastern markets. The new export route by the Hudson Bay Railway to Churchill was first used in 1931, and large-scale exportation is beginning. Harbour works



FIG. 94. ONE OF THE LARGEST GRAIN ELEVATORS IN THE WORLD,
AT PORT ARTHUR

It has a capacity of nearly 7,000,000 bushels, and, like most recently built elevators, is of reinforced concrete, proof against fire and vermin. Note the many pipes employed in filling the lake vessel. The grain-carrying boats are broad and of shallow draft, with great carrying capacity.

By courtesy of the Canadian National Railways

and a grain elevator (2,500,000 bushels capacity) have been constructed at Churchill, and this route may become very important, as it is roughly 1000 miles shorter than the Great Lakes-St Lawrence route, and greatly reduces the number of times the grain has to be handled and stored. Hudson Strait is generally open for navigation for three months (August to October), just at the period when the harvest is ready for export.

An important development in the marketing of Cana-

THE PRAIRIE PROVINCES

dian wheat was the formation of wheat pools, in Alberta in 1923, and in Manitoba and Saskatchewan in 1924. The farmers in each province supply wheat to their own pool, which undertakes the whole business of storing, transporting, and selling. This co-operation reduces the costs and secures a better price for the farmers. The three pools handle the greater part of the wheat export. They



FIG. 95. THE HARBOUR, CHURCHILL, MANITOBA

Note the breakwater, grain elevator, and workers' cottages of this new grain port.
The first cargo of wheat reached London in October 1931.

By courtesy of the National Development Bureau, Ottawa

possess over 1600 country elevators and eleven enormous terminal elevators at Fort William, Port Arthur, Buffalo, Vancouver, and Prince Rupert.

The following statistics of Canadian export are worthy of study:

YEAR	EXPORTS OF WHEAT ¹ (IN BUSHELS)	YEAR	EXPORTS OF WHEAT ¹ (IN BUSHELS)
1870 .	3,127,503	1928 .	407,564,186
1913 .	135,587,447	1929 .	186,267,210
1925 .	324,592,024	1935	254,424,275

¹ Including flour expressed in equivalent of wheat.

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The harvest of 1928 was the highest ever recorded in Canada. The big drop in the 1929 export was due to several causes. Much of the grain was held back in hopes of better prices, but—unfortunately for the Canadian farmer—the European harvests were good, 'Argentina marketed over 100,000,000 bushels of surplus wheat at the end of 1929, and Russia once more became a wheat-exporter. Finally, the general slump in world trade, and the production of more wheat than the world consumes, combined to reduce the market price to an extremely low level. In 1931 adverse climatic conditions greatly reduced the Canadian crop; Argentina, Australia, and the United States reduced their acreage under wheat, and European grain crops (notably rye) were also reduced. The Canadian wheat crop in 1935 was seriously affected by rust (a fungus disease), and in 1936 drought, especially in Saskatchewan, reduced the yield to the lowest since 1919. The Canadian grain trade is obviously influenced by changing climatic and market conditions, not only in Canada itself, but also in other parts of the world. Nevertheless, a gradual return to more normal conditions appears likely in the wheat trade, with an annual export from Canada of about 250,000,000 bushels. The low yield of a bad year can generally be supplemented for export purposes from the accumulated surplus held over from former years of better harvest.

EXERCISES

1. Write an account of the mining industries of the Prairie Provinces.
2. Draw sketch maps to indicate the position and importance of (a) Edmonton (b) Calgary (c) Regina (d) Saskatoon.
3. "Winnipeg is the Chicago of Canada." Discuss the truth of this statement.
4. Write a concise account of the farming industries of the Prairie Provinces indicating the probable lines of future development.

CHAPTER XVIII

ONTARIO AND QUEBEC

ONTARIO and Quebec include on their southern margins adjoining the Great Lakes and the St Lawrence the most important sections of Eastern Canada and the most populous areas of the whole country. The greater part consists of the eastern half of the Canadian Shield, and is of less importance. The drainage is either to Hudson Bay or the Great Lakes and St Lawrence.

ONTARIO

From 1791 to 1867 Ontario was known as Upper Canada, and only extended as far north as the Albany river. The present area is 412,582 square miles—more than three times the size of the British Isles. The population in 1931 was 3,431,700. Ontario may be divided into two geographical regions: Southern or Old Ontario and Northern Ontario.

Northern Ontario. Northern Ontario comprises four-fifths of the province, and includes the District of Patricia (north and west of the Albany river), added in 1912. The whole region is part of the Canadian Shield, dotted with innumerable lakes, linked by rivers that afford good waterways for small craft and great possibilities for hydro-electric power. Although there are areas of bare rock, there are also extensive tracts of good farming lands. Considerable areas (over 30,000 square miles) are covered with glacial soils. One of these is the Rainy¹ River Valley, west of Lake Superior, where cultivation is increasing.

¹ The name is a corruption of Rene, the name of a French explorer.

NORTH AMERICA

In addition, the Great Clay Belt, traversed by the Canadian National Railways, has 20,000 square miles of good arable land, much of which already supports a mixed farming industry, including dairying and the raising of livestock. The climate is healthy and invigorating, with long, warm days and cool nights in summer, while the cold, dry winters are not unpleasant. Rainfall is abundant

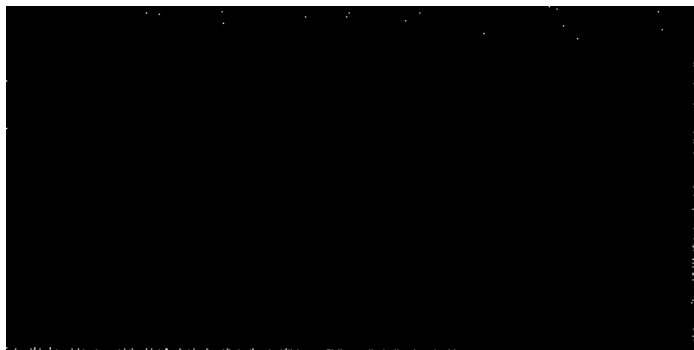


FIG. 96. A PIONEER HOME IN CANADA

The settler has begun to clear his 160 acres of free land to make room for crops and animals.

By courtesy of the Canadian National Railways

and comes mainly in the summer half of the year. The frozen lakes and rivers and snow-covered ground provide good transport for lumber and minerals. Railway extensions are assisting the development of this Clay Belt, and it is proposed to continue the line from Cochrane to Moose Factory, on James Bay. The present wealth of Northern Ontario, however, is its minerals and forests. About 240,000 square miles are covered with forests,

ONTARIO

abounding in game (including fur-bearing animals) and possessing immense resources of pulp-wood, the chief trees being spruce, pine, and poplar. The most important lumbering districts are round the Upper Ottawa river, west of Lake Superior, and north of Georgian Bay. Ontario surpasses Quebec in lumber production, the annual value being half that of British Columbia. Ontario shares

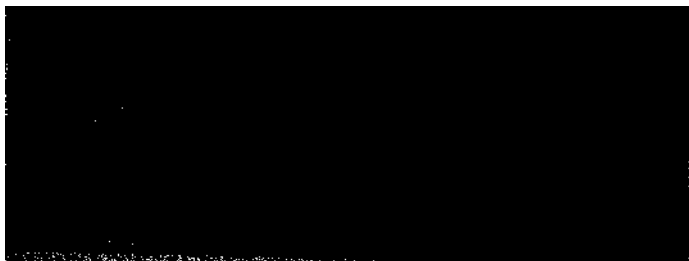


FIG. 97. A SAW-MILL AT KENORA, ON THE NORTH SHORE OF THE
LAKE OF THE WOODS, ONTARIO

Note the two great rafts of lumber. Sometimes lumbermen travel down the
rivers on the rafts, living in wooden cabins.

By courtesy of the Canadian Pacific Railway

with Quebec the bulk of Canadian wood-pulp production, three-quarters of which is made into paper in great combined mills that manufacture their own pulp. Most of the paper is newsprint. Canada sends about four-fifths of its annual exports of pulp-wood, pulp, and paper to the United States, the world's greatest paper-consumer. Canadian newsprint export ranks second to wheat.

Ontario is the leading mineral province, with an annual output three times that of British Columbia, and over one-half that of all Canada. Most of the minerals were

NORTH AMERICA

discovered during the construction of railways. The chief minerals are gold, nickel, and copper. Gold has been located in many parts of the province, but the leading districts are the celebrated Porcupine Area and the newer Kirkland Lake Area, both north of Georgian Bay. and

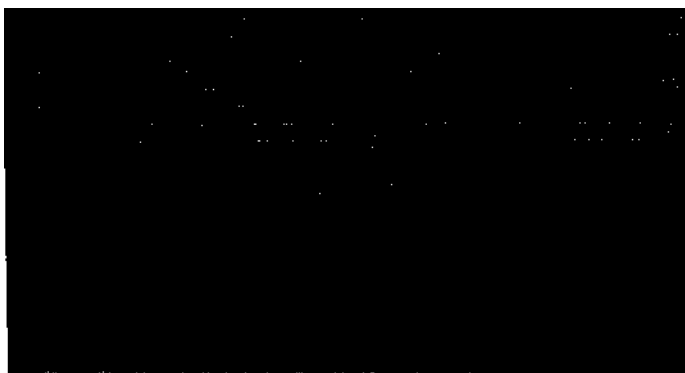


FIG. 98. NICKEL-MINING: THE FROOD MINE, SUDBURY

By courtesy of the Canadian National Railways

the world's output. The ores contain 3 per cent, of nickel, 1*5 per cent, of copper, and smaller quantities of gold, silver, and platinum. The Sudbury supply of platinum is only exceeded by that of Russia and Colombia. Nickel is added to steel to produce a metal of extraordinary toughness. Nickel-steel was first used for armour-plate, big **guns, and other war** equipment, but since the Great War

¹ Canada is now the world's third greatest producer (after South Africa and U.S.S.R.).

ONTARIO

it has been put to uses of far greater value in machinery and apparatus, and the production of nickel has almost reached that of 1918, when war demands were at their greatest. Nickel is extensively used in the manufacture of forks, spoons, keys, and watch-cases, and for plating on other metals. The copper of the Sudbury mines is nearly as valuable as the nickel. The ores are refined to produce a matte containing 80 per cent, of metal (both nickel and copper), and large quantities are sent for further refining to Swansea, South Wales. Silver is obtained from the Cobalt district, one of the richest silver-mining camps in the world, but since 1911 there has been a steady decline in output, the present value being only one-quarter that of pre-War years. Lead and zinc are produced in the Sudbury district, and iron ores are present at many points near Lake Superior. But at present Ontario has no iron-mines working, and obtains the bulk of its iron ores from the United States. The chief iron and steel manufacturing plants are at Hamilton and Sault Ste Marie.

Apart from lignite near James Bay (not yet worked), Ontario has no coal, and has to import great quantities from the United States, besides a little anthracite from South Wales. Immense deposits of gypsum near James Bay also await development. Ontario is fortunate in having most of its principal mineral areas within easy reach of the great centres of population (notably Toronto), and the abundant water-power furnishes electricity for lighting and working the mines.

The Algonquin National Park, of some 2000 square miles, lies near the Ottawa river. It was selected for the diverse beauty of its rivers, lakes, and forests.

Fort William (26,000) and Port Arthur (20,000) stand together on Thunder Bay, on the north-west of Lake Superior. Their enormous grain elevators mark the change from rail to steamship transport. Local water-power is encouraging manufacturing industries.

Southern Ontario. Southern Ontario lies south of the

NORTH AMERICA

Ottawa river and Lake Nipissing. It contains the great majority of the inhabitants of the province, and furnishes in its farm products the greatest source of wealth. Old Ontario, as this region is often called, is mainly the Lake Peninsula, lying like a wedge between Lakes Huron, Erie, and Ontario. It is an area of fertile loams and glacial clays, with abundant rainfall and good natural drainage. The Lake Peninsula is the most southerly part of Canada, corresponding in latitude with Northern Italy. Its summers are long, warm, and sunny, while the lakes temper somewhat the severity of the winters. Ontario is the chief province for root crops, and wheat, barley, peas, beans, potatoes and other roots, fodder corn, hay, and clover are grown in big quantities. Mixed farming is highly developed, Ontario possessing more milking and other cattle, sheep, pigs, and poultry than any other province. In number of horses it is only surpassed by Saskatchewan and Alberta. Dairy-farming is of very great importance, producing more than half the Canadian cheese and one-third the butter and milk. A big proportion of the agricultural produce is grown as fodder, and skimmed milk is fed to pigs. Large numbers of live animals are exported to the United States, which take nearly half the Canadian export of animals and animal products, while Great Britain receives great quantities of cheese, bacon, and butter. The farmers work on co-operative lines, supplying their produce to creameries and cheese factories, which market the commodities.

The Niagara Peninsula, between the end of Lakes Erie and Ontario, is one of the most productive fruit regions in the world. The sunny climate, genial influence of the lakes, and fertile soil combine to produce huge crops of apples, peaches, grapes, cherries, plums, pears, and small fruits. Electric railways link the orchards with the cities, to supply them with fresh fruits. Co-operative marketing is the rule, and large canning factories take the surplus fruit and vegetables.

ONTARIO

Tobacco, grown in the extreme south-west, near Lake Erie, sugar-beet, and flax are increasing in importance. The fresh-water fisheries of the Great Lakes and the numerous other lakes and rivers are extensive and valuable. Petroleum, natural gas, gypsum, and salt are important products of the shorelands of Lake Erie.

Since 1910 the Hydro-electric Power Commission of Ontario (owned by the provincial Government) has supplied electric light and power from Niagara Falls. Water is diverted above Niagara Falls into a canal which runs thirteen miles across country on the Canadian side of Niagara river to a power-house near Queenston, where it has a fall of 305 feet as it rushes through huge steel pipes down the cliff into generators at the edge of the river. These generators, the largest in the world, develop 560,000 horse-power out of a total of over 1,260,000 supplied by the Commission. This power is so cheap and abundant, there is available such a wealth of raw materials, and transport facilities by water and land are so excellent, that Ontario has become the chief manufacturing province. The leading manufactures are iron and steel goods, machinery, electrical apparatus, agricultural implements, railway stock, motor-cars, textiles, furniture, and leather goods. There are also mills for flour, oatmeal, paper, and sugar.

Ontario has an admirable system of communications. During the summer months the Great Lakes are busy with many passenger liners and freight vessels, including the grain-carriers from Fort William and Port Arthur. Of the canals the most important are the Rideau Canal, between Ottawa and Kingston, and the Trent Valley Canals, from Trenton to Georgian Bay. Ontario is crossed by the transcontinental lines of the two great railways, and in Southern Ontario there is an elaborate network of railways, including hundreds of miles of electric lines.

Toronto (631,000), the capital of Ontario, has a fine harbour on the north-west of Lake Ontario, and is the

NORTH AMERICA

second city of Canada. Its position at an important junction of railway and water routes¹ provides raw materials for many industries, including farming implements, railway stock, shipbuilding, and meat-packing. Proximity to Niagara ensures cheap electricity.

Hamilton (155,000) stands at the western end of Lake Ontario, in the heart of the great fruit-lands. Of its many industries the chief are iron and steel, boots and shoes, glass, and furniture.

London (71,000), on the Thames river flowing into Lake St Clair, is the chief distributing centre of an important agricultural region, and stands on the direct railway routes between Toronto and Chicago. Farming implements, boots and shoes, bricks and tiles, are manufactured. Windsor (63,000), standing opposite Detroit, has similar industries. Sault Ste Marie (23,000) has large steel-mills and pulp-mills. Kingston (23,000), at the eastern end of Lake Ontario, makes steam-engines, motor-cars, and farming implements, and is a port of call for steamers.

Ottawa (127,000) is finely situated on hilly ground overlooking the Ottawa river, where the Chaudière Falls mark the limit of navigation and supply electric power for saw-mills and pulp-mills. At the time of confederation Ottawa was selected as capital of the Dominion, in order to settle any rival claims of Quebec, Montreal, and Toronto. At that time Ottawa occupied a central place in the only part of Canada that was really peopled.

QUEBEC

Quebec, the largest province, includes land on either side of the St Lawrence river throughout the greater part of its length, and extends north to Hudson Strait. The early history of the province is inseparably connected with such great Frenchmen as Jacques Cartier, Samuel de Champlain, and Governor Louis de Frontenac. From

¹ Toronto means 'place of meeting.'

QUEBEC

lake or river, where they are piled upon the ice or on the banks. In April, when the spring thaw begins, the river-drivers (usually French-Canadians) float the logs down the flooded streams into the main rivers, where booms are erected to hold up the logs. When all the logs have been

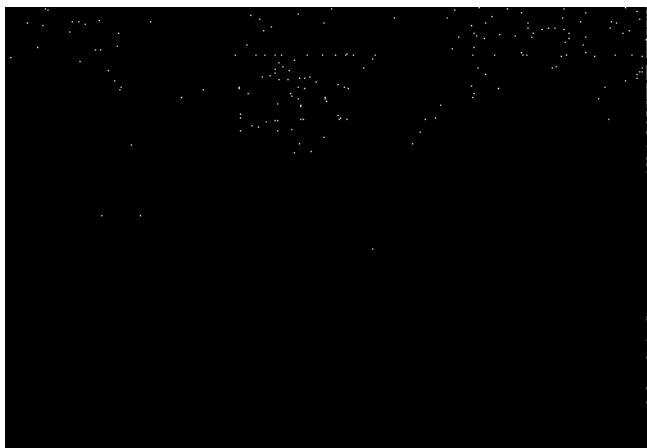


FIG. 101. LUMBERING CABINS, EASTERN CANADA

Some log shanties have sleeping accommodation—bunks—for fifty men. Note the bearskin stretched out to dry on a frame, near the smallest hut.

By courtesy of the Canadian Pacific Railway

collected together the men allow them to drift downstream towards the saw-mills or wood-pulp mills, a journey lasting until late August or early September. The river-driver needs great skill, strength, and endurance, for he must be prepared to break up any log jam that occurs. In 1924 Quebec set up a special Forest Protection Service, to minimize losses by fire, which destroys more timber than is cut.

NORTH AMERICA

In 1927 the forests were patrolled by more than 4000 inspectors, rangers, and assistants, who travelled more than 700,000 miles by canoes, railroads, automobiles, etc. The equipment includes about 350 observation towers, about 3000 miles of telephone, the radio, and aviation.¹

Reafforestation is actively carried on in order to provide supplies for the future, and millions of trees are planted in various parts of the province every year, in order to maintain and possibly increase the timber resources. The Government of the province has also set aside forest reserves of over 90,000 square miles.

Hydro-electric power is used in the saw-, paper-, and pulp-mills. Quebec is the leading province, both in available and developed water-power. The chief developments are on the St Maurice river (Shawinigan² Falls and Grand'-M&re), the Saguenay river (Lake St John), the St Lawrence river (Cedar Rapids and Lachine Rapids), and the Ottawa (Chaudiere Falls). Quebec ranks second to Ontario in lumber products, but is easily first in wood-pulp, producing about half the Canadian supply.

The mineral wealth of Northern Quebec is practically untouched, and developments have only taken place in the southern parts of the Laurentian Plateau. Copper, gold, zinc, lead, silver, graphite, and mica are obtained, and future developments on a great scale are certain. The reduction of aluminium ores, such as bauxite, is only possible with cheap electric power, and, although Quebec produces no aluminium ores, large quantities are imported for reduction at Shawinigan Falls, and on the Saguenay river. Gold output has greatly increased.

Mixed farming is carried on in the Clay Belt, continuing that of Northern Ontario, and dairy-farming round Lake St John, both areas being very modern settlements, along the line of the Canadian National Railways.

¹ From *The Natural Resources of Quebec*, published by the Department of the Interior, Canada, 1929.

² The accent is on the second syllable.

QUEBEC

South of the St Lawrence, and east of Quebec City, there is a section of the Appalachian Highlands, including the Notre-Dame and Shickshock Mountains, and forming the Gaspé Peninsula. The Eastern Townships are also in this region. There are important timber supplies, but not many good streams, except in the Eastern Townships,

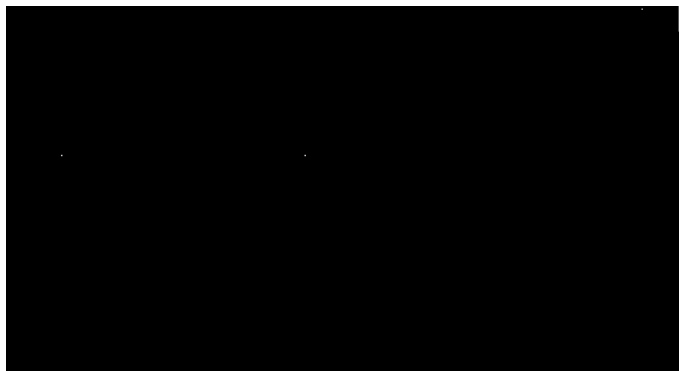


FIG. 102. QUARRY AND MILL, QUEBEC ASBESTOS CORPORATION

Note the quarry in the foreground, the ugly heap of mine refuse on the right, and the mill for treating the asbestos fibre.

By courtesy of the Canadian Pacific Railway

where hydro-electric power is developed. Lead and zinc are mined in the Gaspé Peninsula, but the chief mineral of the region (and of the province) is asbestos, from the Eastern Townships, supplying 80 per cent, of the world's requirements. Electric power from Shawinigan Falls is brought to the mines and mills by a line of no miles, carried across the St Lawrence by two steel towers, 350

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feet high, erected on opposite banks. Asbestos is a fibrous mineral capable of being woven into cloth that is fireproof. The longer fibres (of one inch or more) are woven into special clothing, gloves, aprons, theatre safety curtains, etc. The shorter (and cheaper) fibres are made into heavy millboard, often corrugated, for the construction of

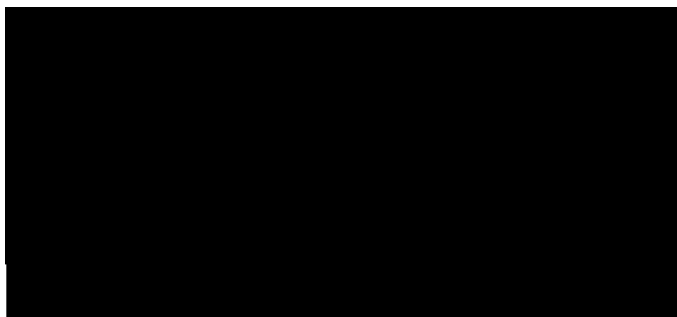


FIG.. 103 RURAL SCENE IN THE EASTERN TOWNSHIPS,
QUEBEC PROVINCE

A typically English farming scene. It is a mistake to think of Canada as entirely a land of enormous farms and giant agricultural machines. There is a good deal of small-scale farming, especially in Eastern Canada.

By courtesy of the National Development Bureau, Ottawa

garages, station roofs, and other fireproof structures. Practically all the fibre is exported for manufacture to Europe and the United States.

The hilly region of the Eastern Townships includes some splendid farming country, noted particularly for dairy cattle and sheep. The chief farm-lands of Quebec are the fertile St Lawrence lowlands, which adjoin the

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FIG. 104. AEROPLANE VIEW OF GRAND' MERE, QUEBEC PROVINCE

A splendid example of water-power development on the St Maurice river, the greatest source of power in the province. On the right of the busy industrial town of Grand'Mere lies the great dam of the La Gabelle power plant, generating 150,000 h.p., with a big wood-pulp mill immediately on the left.

By contrUsy of the Canadian Pacific Railway

NORTH AMERICA

Eastern Townships and are widest in the south. Agriculture is the leading occupation of Quebec, about half the value of farm products being field crops. Mixed farming is general. The rapid development of large-scale

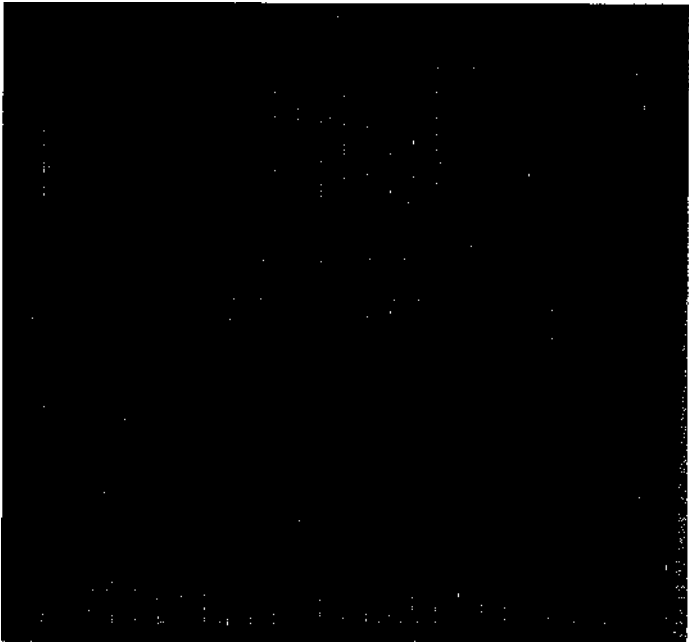


FIG. 105. COLLECTING MAPLE SUGAR, QUEBEC PROVINCE

The best sap is obtained in early spring (late March). Holes are bored in the trees with a brace and bit, and the sap is allowed to run into buckets. Note the sledge for taking the sap to the sugar-house, where it will be boiled.

By courtesy of the Canadian National Railways

production in the Prairie Provinces has led to a decline in the importance of grain in Eastern Canada and a greater tendency to concentrate on dairy-farming. The rich soils and damp climate of the Quebec lowlands are ideal for fodder crops (chiefly hay and clover), and these account

QUEBEC

for more than half the value of field crops. Oats rank next in value, then potatoes. There are hundreds of cheese and butter factories, mostly run co-operatively by the farmers. Bacon is a by-product of the dairy industry, beef cattle are important, and poultry-raising is prosperous. Apples, melons, plums, strawberries, and other fruits are grown in large quantities, while maple sugar and



FIG. 106. QUEBEC BRIDGE

This bridge, 3239 feet long, with the centre span 150 feet above high tide, spans the St Lawrence six miles above Quebec City. It is an important link in railway (C.N.R.) and road communications.

By courtesy of the Department of Immigration and Colonization, Ottawa

syrup are valuable products. Tobacco- and flax-growing and fur-farming are other industries of note. The fisheries of the St Lawrence river and gulf (chiefly cod, lobster, and herring) have long been important, and there are many fishing villages along the St Lawrence.

Quebec naturally owes much to the excellent communications of the St Lawrence and its tributary the Ottawa, which affords an easy and direct route to the west, and it is on or near these rivers that one finds the chief towns of the province.

Quebec (130,000), capital of the province, is historically

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the most interesting Canadian city. It is built on and round a bold promontory at a narrow part of the river St Lawrence, above the Island of Orleans. The Indian name Quebec means 'The Narrows'. The old town, with its winding streets, narrow and steep, lies on the top and sides of the promontory, which is crowned with the citadel. The harbour works and commercial quarters lie



FIG. 107. HEIGHTS OF QUEBEC CITY FROM THE HARBOUR, SHOWING
A SECTION OF THE WATER-FRONT

The high building is the C.P.R. hotel, Chateau Frontenac, which overlooks the Citadel. The harbour extends to the right. Beyond the river steamer on the left new harbour works are being constructed at Wolfe's Cove.

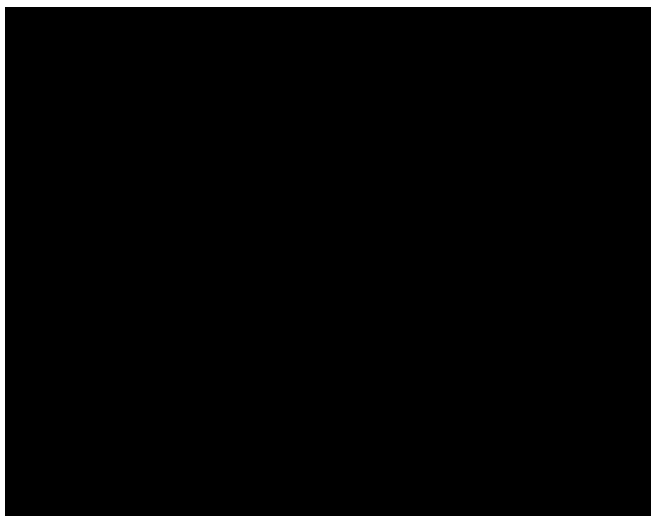
By courtesy of the National Development Bureau, Ottawa

along the lowlands of the river-bank. Quebec is the trade centre for the Lower St Lawrence and an export point for lumber, wheat, and dairy produce. Montmorency Falls, on the Montmorency river, seven miles lower down the St Lawrence, provide electric power for the manufacture of paper, leather, and cotton. The Laurentides National Park lies due north of Quebec.

Montreal (818,000), the largest city, port, and commercial centre of Canada, lies 180 miles farther up the St

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Lawrence than Quebec, and, since the deepening of the river, has rapidly outstripped Quebec as a port. Montreal is 1000 miles from the Atlantic, and is head of navigation for ocean-going vessels. The city is built at the foot of Mount Royal (Mont Real), on the eastern shores of an



"TIG. 108. A SECTION OF MONTREAL HARBOUR

Ocean-going liners, tramp-steamers, and canal boats lie alongside the piers, which are equipped for conveying grain to and from the holds of vessels. Two of Montreal's four great elevators can be seen. No. 1 elevator, on the left, has a capacity of 4,000,000 bushels.

By courtesy of the Canadian Pacific Railway

island, at the meeting-place of some of the most important natural routes in North America. The St Lawrence gives access to the Atlantic and Great Lakes; the Ottawa Valley leads to Georgian Bay and the west; the Richelieu-Champlain-Hudson Valley gives direct access to New York. Montreal is thus a great railway centre. Its harbour in extent and equipment is one of the first in the

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world. Through it pass an enormous export trade in grain, flour, cheese, timber, meat, hides, furs, minerals, etc., and a valuable import trade in manufactured goods and raw materials. Were it not that the St Lawrence is icebound for five months in winter Montreal would be an even greater port, possibly rivalling New York. The



FIG. 109. A SECTION OF MONTREAL, LOOKING DOWN THE
ST LAWRENCE

Note the new harbour bridge, for road traffic, across the river. The principal wharves lie to the right of the bridge, where also the Lachine Canal begins.

By courtesy of the National Development Bureau, Ottawa

Lachine Rapids supply power for many industries, such as flour-milling, sugar-refining, textiles, and breakfast foods. Montreal is a splendidly built city, characteristically British, in striking contrast to French Quebec.

Hull (29,000), standing opposite Ottawa on the Ottawa river, is an important lumbering centre, with saw-mills, pulp-mills, paper and match factories, dependent for power on the Chaudiere Falls. Three Rivers, or Trois

THE MARITIME PROVINCES

to the Gulf Stream, however, all harbours are ice-free, a fact of vital importance to Canadian trade.

New Brunswick.¹ The settlement round the St John river became important enough to be established in 1784 as the separate province of New Brunswick. Development has been steady, without the rapid increases of population that mark the progress of other provinces. About one-third of the inhabitants are French, mainly descendants of the Acadians, and, like them, engaged in fishing or agriculture, chiefly in the counties bordering the Gulf of St Lawrence. The majority of the other two-thirds are British, and include many descendants of the United Empire Loyalists.

The farming industries of New Brunswick have been neglected until recent years, mainly owing to the tendency of the young people to migrate to the flourishing industrial areas of New England, Ontario, and Quebec or the farmlands of the Prairie Provinces. To-day, however, farm products are the leading source of revenue. More than half the province is potential farm-land, and of this about 40 per cent, is occupied. The chief farming areas are in the coastal belts and the valley of the St John river. The leading crops are hay and clover, oats, potatoes, buckwheat, and turnips. The marshlands bordering the Bay of Fundy were dyked and reclaimed by the French, and have always yielded heavy crops of hay. The dykelands cover 60,000 acres in New Brunswick and 15,000 in Nova Scotia. Their fertility is remarkable, and may always be renewed. The dykes can be opened at convenient places to allow the tides to enter. The salt water kills all bog plants, and in two or three years covers the entire surface with a thick layer of new mud, on which hay crops may be grown when the dykes have been repaired and the land drained by ditches. The production of so much fodder is a clear indication of animal wealth. Dairy produce (butter, cheese, and ice-cream) is growing in importance, and accounts for 25 per cent, of the value of farm products.

¹ Area 27,985 square miles. Population in 1931, 408,000.

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Dairy-farming is almost confined to the lands south-east of St John. Sheep, pigs, horses, beef cattle, and poultry are also bred, but New Brunswick still finds it necessary to import meat and eggs. Small fruits and apples are not exported to any extent, but the export of potatoes (of splendid quality) is greater than that of any other province, Eastern Canada, New England, and the West Indies being the chief markets.

For three centuries the forests have been important, and the annual value of their products ranks only a little below that of farming. More than three-quarters of the province has forests of spruce and balsam fir., which are valuable as pulp-woods. There are numerous saw-mills, pulp-mills, and paper-mills in the St John River Valley and on the north-east coast. Unfortunately big exports, added to still greater losses by fire and diseases, have reduced production to little more than half what it was ten years ago. Increasing attention is given to fire prevention, the gravest problem connected with the forests. Exports to Britain and Europe have declined in competition with Sweden, Norway, and Finland. The pulp and paper industry is flourishing, and there are many factories turning out furniture, doors and window-frames, barrel staves, boxes, etc. Hardwood timbers (birch, maple, and beech) are becoming more important owing to the exhaustion of supplies in the United States.

The forests contain many species of fur-bearing animals. In recent years the largest numbers killed have been weasels and muskrats, although red foxes were the most valuable. Fur-farming has made rapid strides, and there are over 1000 farms, mostly breeding silver foxes.

New Brunswick offers so many attractions to the tourist that the value of tourist traffic is more than half that of agricultural products. Probably in no other region of similar size can one enjoy so fully the delights of canoeing, camping, fishing, hunting of moose, deer, and other wild creatures, and bathing. Railways and roads provide easy

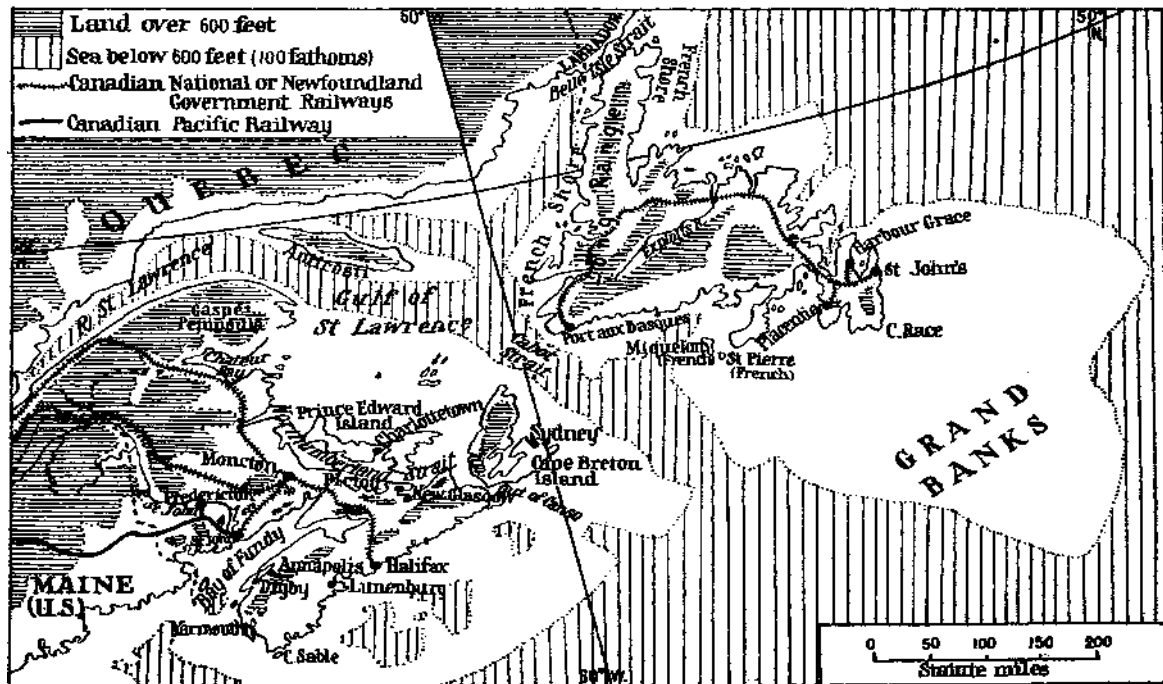


FIG. 110. THE MARITIME PROVINCES AND NEWFOUNDLAND

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access from other parts of Eastern Canada, and from the United States.

Most of the great mineral wealth has not been exploited. Iron, copper, antimony, lead, zinc, tungsten, manganese, oil-shale, and salt are known to exist, but mining is practically confined to coal, gypsum, limestone, sandstone, granite, natural gas, and oil, chiefly in the southern parts of the province. The coal output is insufficient for home needs, and more than twice the quantity of ordinary coal is imported from Nova Scotia, besides anthracite from the United States and South Wales.

The shallow seas lying off the shores of the Maritime Provinces are one of the world's finest fishing-grounds, 200,000 square miles in extent. Good harbours and abundant timber for boats have long made the fisheries of New Brunswick very important. The most valuable fish is the lobster, chiefly obtained off the east coast, where there are many canneries. The British Isles are the principal market for the canned lobster. Other important catches are smelts, chiefly sold frozen to dealers in the United States; sardines (really young herrings caught in huge numbers in the Bay of Fundy), which are canned for export to Mexico, West Indies, Australia, and other countries; cod, salmon, and herring. There are numerous establishments for drying, salting, and packing fish and preparing fish-meal, used as a food for cattle, poultry, and pigs and as a fertilizer.

The manufacturing industries of New Brunswick are steadily developing, the chief being connected with timber and paper, agricultural and animal products, textiles, iron, fish, and electricity. The multitude of water-wheels that formerly worked saw-mills or flour-mills have given place to a small number of hydro-electric installations that supply light and power for industrial purposes—mainly pulp- and paper-mills. The St John river is the chief source of power, but much greater quantities of energy will one day be obtained from the tidal power of the Bay of Fundy.

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Fredericton (8800), the capital of New Brunswick, is the commercial centre of the interior, with manufactures of boots and shoes, canoes, barrel staves, etc. It is an important lumber port at the head of navigation for steamers on the St John river. St John (47,000), at the mouth of the same river, has a splendid ice-free harbour. It has a big export trade in grain and flour, dairy produce,

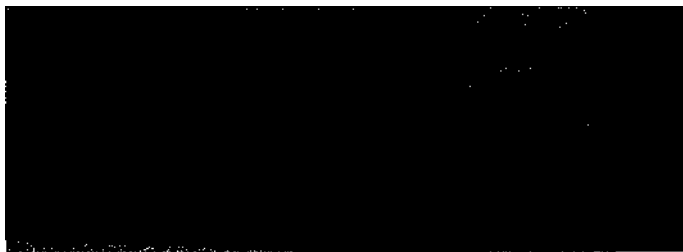


FIG. 1 U . ST JOHN, THE WINTER PORT OF NEW BRUNSWICK

Note the Canadian National Railways station near the centre of the picture and the grain elevator on the right.

By courtesy of the Canadian Pacific Railway

livestock, timber products, paper, etc., chiefly to Britain. St John is particularly important as a winter port and the eastern terminus of the C.P.R. It is the leading industrial centre of New Brunswick, with many lumber-mills, pulp-mills, cotton-mills, metal-works, cold-storage plants, and a large sugar refinery. Moncton (21,000), the second largest city, is the terminus of the Canadian National Railways, which maintain large workshops in the town. The other industries resemble those of St John.

Nova Scotia.¹ Nova Scotia, which is joined to New Brunswick by the narrow isthmus of Chignecto, twelve

¹ Area, 21,428 square miles. Population in 1931, 512,800.

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miles wide, projects into the Atlantic, bringing it 550 miles nearer than New York to Britain. The growing use of aircraft for mails gives Nova Scotia a great advantage as the terminus for ocean steamer transit. Despite its excellent farmlands, mineral wealth, and fisheries, the province has developed slowly, mainly through isolation from the rest of Canada.

There are three main elements in the population of Nova Scotia. The first settlers were French farmers from the region round the Loire mouth, who practised agriculture on the flat salt-marshes of the Bay of Fundy, and French fishermen, especially in Cape Breton Island. Next came disbanded British soldiers at the close of the various wars of the eighteenth and early nineteenth centuries, and thousands of Scottish Highlanders after the Forty-five rebellion. The third great influx was that of 28,000 United Empire Loyalists, at the close of the American War of Independence. Of the present population nearly 80 per cent, are of British descent and nearly 10 per cent, of French. Over 2000 Indians live by farming, labouring, or fishing.

Nova Scotia has four great industries: farming, mining, forestry, and fishing. The largest farm-lands are those of the Annapolis Valley—"the Garden of Nova Scotia*"—and the dykelands. Apart from these there are no extensive areas of cultivation, but many small river valleys with fertile soils. Over half the farmland is pasturage, and the crops of hay and clover exceed all others. Potatoes, mainly from the Annapolis Valley, rank next, and furnish a big export to Havana. Oats and turnips are also of great value. The moist, temperate climate is excellent for fodder crops, and dairying has good prospects for development. An increase in the export to Britain and Europe of butter, eggs, and other perishable products is likely since the opening of the Cold Storage Terminals at Halifax in 1929. The rearing of beef cattle, horses, pigs, poultry, and sheep will also increase.

Fruit-farming has been important ever since the French

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introduced apples in 1633. To-day the apple is as important to Nova Scotia as is the orange to California, The Annapolis Valley and adjoining districts, sheltered on both sides by hills that shut out cold winds and fogs, are the most important apple-orchard region, and, despite occasional losses by late spring frosts, severe winters, or windstorms, the industry is likely to spread to other districts. Annapolis Royal, the oldest European settlement north of Florida, and the cradle of agriculture, milling, and Christianity in Canada, was the capital of Nova Scotia until 1750. In 1880 the apple yield was 20,000 barrels; the annual average is now 2,000,000 barrels—a tribute to the excellent quality of the fruit. Inferior and surplus apples are canned, dried, or supplied to cider or vinegar factories. The waste from skins, cores, etc., is exported for making jams and jellies. Marketing, shipping, and the purchase of fertilizers and implements are done on a co-operative basis. Apart from apples only strawberries are of any real importance at present.

Early French explorers were attracted to Nova Scotia partly by its wealth of fur-bearing animals. Wild animals are still trapped, but fur farms, of which there are over 400, are increasing in importance.

Cape Breton Island and the north end of the main peninsula of Nova Scotia are mainly of Carboniferous and Devonian strata, the former rocks including coal and limestone. The coalfields are the most important on the Atlantic seaboard of America. Three-quarters of the supply is from the Sydney coalfield of Cape Breton, with extensive under-sea mining; the remainder comes from the northern parts of the peninsula. About 30 per cent, of the output goes to Quebec Province. The presence in one region of coal, iron ore, and limestone has given rise to a big iron and steel industry, although over 70 per cent, of the iron is now obtained across 400 miles of sea, from the Wabana mines of Eastern Newfoundland. New Glasgow (9000) and Pictou are the chief centres on the

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peninsular coalfields. Of the other minerals the most important are gypsum, from the northern sections of the province (including Cape Breton), the largest deposits discovered in Canada; gold, of which there has been a small but steady output since 1860; and salt, of great value in fish-curing.

Half of Nova Scotia is covered with forests, of which over 60 per cent, are coniferous (spruce, pine, balsam fir, hemlock, larch, cedar), and the remainder deciduous (beech, maple, birch, oak). Control of forest fires is comparatively easy, owing to the large number of small settlements scattered through the forest belts, where people live by farming in summer and lumbering in winter. There are at present over 350 lumber-mills preparing various types of timber, and six pulp-mills. The supply of pit-props for the coal-mines, and the making of boats, barrel-staves, boxes, and furniture, are other branches of the timber trade. Since the opening of the Panama Canal timber export has declined in competition with British Columbia. Like New Brunswick, Nova Scotia has many attractions for the tourist.

Nova Scotia is admirably placed for the fisheries of the Grand Banks of Newfoundland, as well as her own coastal waters, and her fisheries are the most important in Canada. The chief fish marketed in 1936 were, in order of value, lobsters, cod, haddock, herring, halibut, mackerel, hake, and salmon. The lobster fisheries are the most productive in the world. There are 126 canneries (mainly for lobster) and eighty-six fish-curing plants, where fish are dried, salted, smoked, or pickled for export. The usual by-products (fish-meal, cod-liver oil, etc.) are produced. Lunenburg, Yarmouth, and Digby are three of the more important fishing towns. With her splendid harbours, abundant timber, and skilled sailors, Nova Scotia developed a big shipbuilding industry. About 1864 the province was launching 300 vessels a year. But the change from wood to iron, then steel, and the increase in the size

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of vessels, were a severe blow to the industry, which has greatly declined, save for an artificial boom during the Great War, with its huge demand for small craft. In recent years only a small number of vessels (chiefly motor-boats) have been built.

The southern half of Nova Scotia is compensated for lack of coal by facilities for hydro-electric power, due to



FIG. 112. DRYING CODFISH AT DIGBY, NOVA SCOTIA

Note the two-masted schooners in the harbour. In a cool, temperate climate fish may be preserved by sun-drying.

By courtesy of the Canadian Pacific Railway

the falls of numerous rivers with glacial lakes in their courses to form storage reservoirs. Over one-third of the 300,000 horse-power available has been developed, and the great possibilities of tidal power on the Bay of Fundy have been considered.

The bulk of the trade of Nova Scotia is with Britain, with Canada as a good second. Cotton goods and machinery are the chief imports, from the United States. There is a growing trade with the West Indies and South America, which take most of the cured fish.

Halifax (59,000), the capital of Nova Scotia, has a

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magnificent harbour, and as a terminus of the Canadian National Railways possesses a huge grain elevator (2,200,000 bushels) and cold-storage plant. There are also shipyards, with repairing and graving dock and ship-building facilities. The biggest ocean liners can berth alongside the quay wall. Halifax is the chief British naval base of North America, and during the Great War many

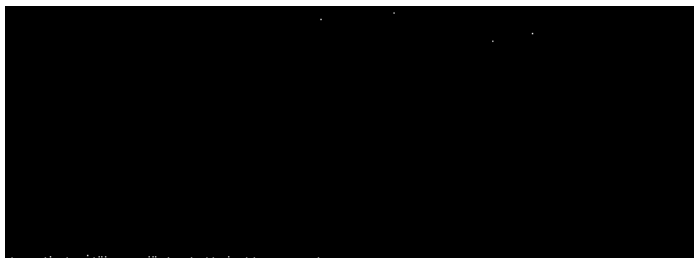


FIG. 113. HALIFAX HARBOUR, NOVA SCOTIA

A splendid deep-water harbour, in area about ten square miles, ice-free, **siltless,** and **sheltered.** Halifax is the Atlantic terminus of the Canadian National Railways.

The hotel behind the town is mixed by a cathedral.

Halifax is the Atlantic terminus of the Canadian National Railways.

convoys of troop-ships and other vessels left the harbour for Europe. Important steamship lines run to ports in the Americas, Europe, and Australia and New Zealand. There is a large export of fish, apples, grain, etc.

Sydney (23,000), on the eastern arm of Cape Breton Island, which is almost cut in two by the St Andrew Channel and Bras d'Or Lake, also has a fine natural harbour. Sydney is a great coal port, and has the biggest iron- and steel-works in Canada.

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Prince Edward Island.¹ Prince Edward Island is the smallest and most densely peopled province of Canada. Discovered by Sebastian Cabot in 1497, it was first settled by the French, but became British in 1758, and was made a separate colony in 1769. The island is long, narrow, and much indented. Its low coasts are fringed with sand-dunes; the surface is gently rolling, nowhere exceeding 500 feet. It closely resembles the English county of Devon. In area they are similar: both have rich, dark red, sandy soils; their maritime climate is healthy and free from extremes; dairying, fruit-growing, and fishing are leading industries. Devon, however, has nearly ten times as many people. Agriculture is the chief occupation of the island, almost the whole of which can be cultivated. The principal crops are oats, potatoes, and wheat, which exceed the production of Nova Scotia, hay, clover, and barley. There are big exports of butter, cheese, bacon, beef, fruit, poultry, and eggs, chiefly to the neighbouring parts of North America. The island shares in the fisheries of lobster (the chief), smelts, cod, herring, and oysters. The modern industry of fur-farming (almost wholly of silver foxes) is highly flourishing. The pelts are exported to the United States and Europe.

The 286 miles of railway are part of the Canadian National Railways, and a powerful ferry steamer for railway trains and motor-cars maintains constant communication with New Brunswick across the narrowest part of Northumberland Strait (nine miles). Charlottetown (12,000), the capital and commercial centre, has a fine harbour on the south coast. There is a big pork-packing plant.

LABRADOR

Labrador, a plateau land dotted with lakes, but largely unexplored, forms the north-easterly part of North America. It adjoins Quebec Province, but, being governed

¹ Area, 2184 square miles. Population in 1931, 88,000.

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by Newfoundland, is not part of the Dominion of Canada. For about thirty years the boundary was in dispute between Canada and Newfoundland, but in March 1927 the Judicial Committee of the British Privy Council decided that the boundary should be the watershed of the rivers flowing to the Atlantic, thus awarding to Newfoundland a territory of 110,000 square miles on the mainland, instead of merely a coastal strip.

The climate of Labrador, owing to the cold Labrador Current, drifting icebergs in early summer, and chilling winds from the interior, is bleak and uninviting. There is, however, considerable undeveloped wealth in water-power, pulp-wood forests (in the south), and minerals. In summer about 15,000 to 20,000 Newfoundland fishermen come to the Labrador coasts for cod. The Eskimo (about 1000) are declining in numbers. The settled population of 4000 includes some hardy British fishermen. Labrador owes a tremendous debt of gratitude to Sir Wilfrid Grenfell, the famous British medical missionary, who devoted his life to improving the conditions on that inhospitable coast. He mapped the coast, and established a steamship line to take fish to suitable markets and bring back other commodities in exchange. He introduced radishes, cabbages, lettuce, and potatoes, which will grow in sheltered spots, to supplement the one local food-supply of fish. Unfortunately his effort to establish reindeer herds was a failure, owing to losses by fishermen's dogs and poachers, and in 1923 the remnants of the herd were sent to Anticosti Island.

NEWFOUNDLAND *

Shortly after Cabot's discovery of Newfoundland in 1497 Portuguese, Spanish, Dutch, English, and French fishermen began to visit the island for the sake of its astonishingly rich fisheries. In 1583 Sir Humphrey Gilbert

¹ Area, 42,734 square miles. Population in 1935, 289,516.

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arrived in St John's, took possession of the island in the name of Queen Elizabeth, and thus established the first British colony, where a permanent settlement was made in 1623. The French also had settlements, of which Placentia was made capital in 1662, and there was a prolonged struggle until 1713, when the Treaty of Utrecht acknowledged British sovereignty. Disputes as to fishing



FIG. 114. PLACENTIA, THE OLD FRENCH CAPITAL, A TYPICAL
NEWFOUNDLAND FISHING VILLAGE

By courtesy of the High Commissioner for Newfoundland

rights were not settled until 1904. Fishing on the Grand Banks, which are part of the open sea, is free to all nations, but the French, by their treaties with Britain, and the United States, by a treaty of 1818, have the right to land at certain parts of the coast, camp for months, and build sheds to dry fish; but they cannot make permanent settlements. In addition the French retain as fishing stations two tiny islands, St Pierre and Miquelon. St Pierre is a typical French town of 1000 inhabitants. Newfoundland is proud of its place as the oldest colony.

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It has **not** entered the Confederation of Canada, **but** has remained a self-governing unit of the Empire, with a population that is 98 per cent, of British stock.

Newfoundland is part of the Appalachian system, and is crossed from north-east to south-west by parallel ranges, Long Range in the west exceeding 2000 feet. The rugged coasts are indented with deep fjords; the interior is an undulating region with lakes, swamps, waterfalls, stony stretches, and bare rock—eloquent testimonies of heavy glaciation. The margins of rivers and lakes are often areas of good soil, supporting forests, especially in the north; but agriculture is unimportant, save for oats, hay, and vegetables for home use. The climate, raw, wet, and cold in winter, warm from May to September, is only suited to such hardy Northern crops. Sheep, cattle, horses, and pigs are kept, but their numbers are unimportant. The interior supports a few Indians and caribou; but almost every fjord has its little settlement, for the greatest industry is still the fisheries, which employ the bulk of the men. The extensive Grand Banks, with their abundant fish-food brought by the cold Labrador Current and, to a less extent, by the Gulf Stream, are one of the richest fishing grounds in the world. Salmon, halibut, lobster, herring, haddock, smelts, and trout are caught, but the cod-fishery is easily the most important. Cod-fishing, carried on from May to November, is a dangerous occupation, owing to dense fogs, intense cold, wild storms, icebergs, and risks of being run down by great liners. From the small schooners each pair of fishermen goes out in a tiny rowing-boat, called a dory, equipped with a trawl-line (about 3000 feet long) coiled up in a tub. At intervals of six feet on the trawl are fastened two-foot lines with baited hooks on the ends. After laying the trawl, anchored at one end, marked with floats at the other, the men spend the day removing the cod and fixing fresh bait. The fish are packed in ice or salt on the schooners, and taken ashore for sun-drying on the great

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long rows of sheds. Salted, dried, or smoked cod will keep indefinitely, even in the tropics. As a cheap, nourishing food it finds a ready market among the Roman Catholic populations of Portugal, Spain, and Italy. Cod-liver oil, a most valuable medicinal food, is prepared by forcing steam through a large pan containing 60 to 100 gallons of livers, from which the oil is rendered in half an hour.

In early spring hair seals (not to be confused with fur seals) drift south on the stream of ice-floes from the Arctic seas, to give birth to their young off tfre shores of Newfoundland and Labrador. One midnight in early March the sealing fleet leaves the harbour of St John's for the seal nurseries. The men land on the ice-floes, kill the adult male seals, and remove the skins, with a thick layer of adhering fat. Over 200,000 seals are killed annually. Their skins make leather for handbags, motor-cycle seats, etc.; the fat is used in soap-making.

Next to fisheries rank forest products, which have developed very rapidly. Pine, spruce, fir, and birch supply material for large saw-mills and several immense pulp- and paper-mills. Their products rank first in export values.

The largest iron-mine in the Empire is worked at Wabana, on Bell Island, in Placentia Bay. The haematite iron, of excellent quality, is largely exported to Sydney (Cape Breton). Other iron deposits have been discovered near the west coast, where coal is mined. Copper, lead, gold, and silver are found, but little worked. The value of mineral exports almost equals that of fishery products.

Over 750 miles of Government railway (of 3 ft. 6 in. gauge) cross the island from St John's north, west, then south to Port aux Basques, linking together other ports and inland centres. Steamer services (mainly owned by the Government railway) provide regular communication along the coasts and with the mainland of North America.

St John's (40,000), the capital and only large town, has a wonderful harbour, approached through the Narrows between cliffs 500 feet high. St John's is the headquarters

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of the fishing and sealing industries. By sea it is 1120 miles from New York, 550 from Halifax, and 1930 from Liverpool.* Newfoundland is an important link in transatlantic aircraft developments, and several important flights have begun from or near St John's, especially from Harbour Grace (2200 inhabitants).

In recent years there has been great distress among the population (especially the fishermen) of Newfoundland, largely due to the serious decline in the export of fishery products. This and other financial troubles reduced the country to virtual bankruptcy, and an appeal for assistance was made to the British Government. The British Parliament voted monetary aid to Newfoundland, and decided that from 1933 the island should be controlled by a special Commission of six members (three from Newfoundland and three from the United Kingdom), over which the Governor would preside. Self-government will be restored to Newfoundland when trade conditions have improved sufficiently to make the country self-supporting once more.

Newfoundland should derive benefit from the development of the air services inaugurated in 1937 between Foynes, on the Shannon estuary in Ireland, and Botwood, a small port on Notre Dame Bay, in Northern Newfoundland.

GREENLAND

Greenland is a large island (736,518 square miles) stretching from Cape Farewell, in 60° N., to 83° N. The interior varies from 5000 to 10,000 feet above the sea, the island being a plateau covered by an undulating ice-sheet, 6000 or 7000 feet deep, similar to those that covered half of North America in the Ice Age. Only round the edges of the ice-cap is there a border of ice-free land. The coasts are indented by the world's largest and deepest fjords, into which descend great glaciers—the overflow from the ice-cap. Icebergs which break off the glaciers drift south

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into the Western Atlantic in great numbers in spring, sometimes endangering ships before melting away in the warm West Wind Drift. Drift-ice from the Arctic Ocean makes the east coast less accessible than the west.

Only the coastal fringes, especially on the south-west, support vegetation. Willow, alder, and birch, rarely higher than a man, are found in sheltered valleys, so that any wood required must be imported. There are many kinds of moss and lichen, and numerous flowering plants, including crowberries and whortleberries.

Greenland is a Danish possession, and all trade is a monopoly of Denmark, which tries to keep from the natives the curses of alcohol and disease. There are 400 Danes (traders, governors, clergy, doctors, and teachers) and 16,000 natives, living in about sixty settlements, of which only one is on the east coast. The largest settlement is Sydproven (900), just west of Cape Farewell. The natives live in huts of stones and turf, although a few prosperous ones have built wooden houses. Broccoli, rhubarb, lettuce, carrots, and turnips have been grown in small quantities as far north as 70° N., and some sheep and goats are kept. Reindeer are less numerous than of old, but the Arctic pastures of Greenland could support more. Whales, seals, bears, and fish are the chief wealth of the coastal waters, and provide the Eskimo with all their needs. Cryolite, a mineral used in the process of extracting aluminium from bauxite, is mined and exported.

EXERCISES

1. Write an account of the fruit trade of Canada.
2. Reproduce by a map (or maps) the essential facts of the geography of the Maritime Provinces.
3. Compare as fully as possible, Prince Edward Island and Devon.
4. Contrast Newfoundland with Vancouver Island.
5. Compare Halifax with Vancouver, with regard to position and trade.

GENERAL EXERCISES

{The index will be found helpful in attempting these questions.}

1. On an outline map of North America carefully record place-names of Indian, Spanish, French, and English origin, distinguishing between them. What does your map reveal?

2. Describe the more important results of glaciation in North America.

3. Contrast the Mississippi with the Great Lakes and St Lawrence, with especial reference to their value as commercial waterways.

4. Give an account of existing and potential water-power developments in North America. Point out the advantages of hydro-electric power as compared with steam-power dependent upon coal.

5. There are four important gateways from the Atlantic Ocean into the interior of North America. Indicate them on a simple map, and discuss their relative advantages and importance.

6. Show to what extent climatic conditions have influenced the settlement and development of North America as compared with South America.

7. Contrast the western and eastern sections of the United States as divided by the meridian of longitude 100° W.

8. Write an account of (a) farming by irrigation, (b) dry farming, in the United States, Canada, and Mexico.

9. Write an essay on the fisheries of North America.

10. Describe as vividly as possible the life of a typical farmer in (a) the Great Plains, (b) the Willamette Valley, (c) Ontario.

11. Write a full geographical account of the Appalachian Belt of the United States.

12. Give an account of the tobacco trade of North America.

13. Describe a journey down the Ohio and Mississippi, from Pittsburg to New Orleans. Illustrate with a map.

14. Give an account of the petroleum production of North America.

15. Describe and explain the development of mixed farming (including dairy-farming) in Canada and the United States.

16. Write an account of the Canadian fur trade.

17. State which parts of North America lie nearer the North

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Pole than Great Britain, and point out the chief difficulties in the way of their development.

18. A traveller bound for Vancouver leaves Liverpool (or Southampton) on August 5, and crosses Canada by train. Write a descriptive and informative account of his journey. Briefly point out the chief contrasts he would observe if he made the return journey in January.

19. Discuss the part played by railways in the settlement and development of North America.

20. By means of brief descriptions of the facts revealed by certain photographs in this book compile accounts of (a) the grain trade, (b) the lumbering industries, of North America.

21. Discuss the value of aircraft and air photographs in exploration and economic development, with especial reference to North America.

22. Draw diagrams to show the length of the sun's shadow at noon on June 21, December 22, and March 21 at (a) Havana, (b) Winnipeg, (c) Fort Yukon. What important climatic facts are revealed?

23. Discuss the development of air traffic from North America to Europe and Eastern Asia, comparing the advantages of alternative routes, and suggesting suitable intermediate and terminal air-ports.

24. On an outline map of the United States distinguish those states with a population per square mile (a) exceeding 100, (b) 50-100, (c) 10-50, (d) below 10. Comment upon the map.

25. Write brief notes on (a) tornadoes, (b) hurricanes, (c) Chinook winds, (d) fjord coasts, (e) the Fall Line.

26. "The Caribbean Sea and Gulf of Mexico are the Mediterranean Sea of America." Criticize this statement.

27. If you had to earn your living in North America what occupation would you choose, and in which part of the continent would you prefer to live? Describe carefully the route by which you would reach your new home, what you would expect your surroundings to be like, and the kind of life you would expect to lead.

STATISTICAL APPENDIX

The statistics are based upon those given in " The Statesman's Year-book " for 1937.

The values of imports and exports are for the year 1936.

COUNTRY	AREA IN SQUARE MILES	POPULATION, WITH YEAR OF CENSUS OR ESTIMATE	EXPORTS MILLIONS STERLING	IMPORTS IN MILLIONS ; STERLING
Alaska	586,400	59,278 (1930)	12-20 *	6-00 *
Bahamas .	4,404	64,982 (1935)	•13 *	•72 *
Barbados .	166	182,440 (1934)	113 *	1-84 ⁸
Bermudas .	19'3	30,104 (1935)	•12 *	1-42 ⁸
British Honduras	8,598	55,448 (1935)	1-70	2-68
Canada	3,694,863	10,376,786 (1931)	155-81	112-56
Costa Rica.	23,000	577,833 (1936)	4-69 *	4-04 *
Cuba .	44,164	4,011,088 (1933)	30-96	20*64
Curacao and other islands .	403	87,104 (1935)	13*45 ^l	12-90 ^l
Greenland .	736,518	16,630 (1930)	•31 ²	•10 »
Grenada	133	82,624 (1933)	•20 •	•23 *
Guadeloupe and Dependencies	688	267,407 (1932)	1-04 ^l	1-02 *
Guatemala.	45,452	2,245,593 (1934)	3-02	2-30
Haiti .	10,204	3,000,000 (1936)	1-89	i-5i
Honduras .	44,275	962,685 (1934)	2 10 *	1-92 *
Jamaica	4,450	1,121,823 (1935)	3-84	5*oi
—Dependencies	224			
Leeward Islands	727	138,200 (1935)	•56 »	•58 »
Martinique.	385	234,695 (1931)	i-37 *	1-31 ⁸
Mexico	763,944	16,552,722 (1930)	41-71 ²	22-56 ²
Newfoundland .	42,734	289,516 (1935)	577	4'i4
—Labrador .	110,000	4,716 (1935)		
1 Nicaragua .	51,660	750,000 (1930)	1 « 16 *	1-05 *
Panama	32,380	467,459 (1930)	x-xx »	3-19 "
Panama Canal Zone	552-8	29,190 (1936)	—	—
Puerto Rico	3,435 J	1,723,534 (1935)	19-83	16-72
St Lucia	238 1	64,959 (1935)	•15 ²	•17 '
St Pierre and Miquelon	93	4,321 (1931)	•35 *	•19 *
St Vincent.	150*3	47,961 (1931)	•13 "	•17 ²
Salvador .	13,176	1,574,495 (1934)	2'29 *	2-16 ²
Santo Domingo.	19,332	1,478,121 (1935)	3-97 ⁸	1-96 ⁸
Trinidad .	1,862	439,994 (1935)	4-i6 ²	4-20 ⁸
—Tobago	116			
United States .	2,973,776	128,429,000 (1936)	490-70	483-85

¹ Figures for 1934.

* Figures for 1935.

* Figures for 1933.

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For comparison the corresponding figures for Great Britain and Northern Ireland are given:

POLITICAL DIVISION	AREA IN SQUARE MILES	POPULATION (1931)	EXPORTS IN MILLIONS STERLING	IMPORTS i IN MILLIONS j STERLING j
England Wales . Scotland Northern Ireland	50,874 7,466 30,405 5,221	37,794,003 2,158,374 4,842,980 1,293,000 (1930)	501-14	848-94

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