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HARRAP'S NEW GEOGRAPHICAL SERIES

General Editor: DR R. N. RUDMOSE BROWN

SOUTH AMERICA

BY

EDWARD V. LANE M.A. (LIVERPOOL)

SENIOR GEOGRAPHY MASTER BEC SCHOOL LONDON
FORMERLY SENIOR GEOGRAPHY MASTER THE COUNTY SCHOOL CHISWICK
AND FIRTH PARK SECONDARY SCHOOL SHEFFIELD

*WITH THIRTY MAPS AND DIAGRAMS
AND THIRTY-THREE ILLUSTRATIONS
FROM PHOTOGRAPHS*



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PREFACE

DURING the last thirty years South America has developed economically perhaps more rapidly than any other continent. Since the Great War progress in certain South American countries has been amazingly rapid, and the continent is certain to achieve a progressively greater importance in the world as time goes on. Yet our school text-books in general continue to treat South America as a kind of minor appendage to an account of North America. In five very modern and widely used text-books on the Americas the proportions of the whole book devoted to South America are as follows: 19, 20, 24, 28, and 30 per cent.—an average of under 25 per cent. In my opinion the proportion should be about 40 per cent. Many text-books give what amounts to little more than a skeleton outline of South America, and a skeleton, after all, can never be other than dry bones. Some teachers may consider my treatment too full for the purposes of School Certificate and Matriculation examinations. However, our aim as teachers is not merely to turn out successfully primed candidates, nor yet necessarily to produce expert geographers, but rather to educate citizens with an informed appreciation of the homelands, modes of life, and intimate problems of other peoples.

School atlases do not contain many maps of value in a study of South America. I have therefore thought it advisable to include a larger number of maps than is usual in such a book. I have also sought to save the time of the teacher and increase the interest of the pupil by explaining the meanings of unusual words, the nature and economic uses of products, and the origin of place-names, so often a key to location and history.

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In the writing of this book I have received considerable assistance from the Consuls of nearly all the South American republics. Indeed, I found them only too anxious that the generation of to-morrow should learn something of what South American countries have already achieved and of the future that lies before them. The Consuls of Brazil and Argentina have been kind enough to read and express their appreciation of the chapters dealing with their respective countries. I must also express my grateful thanks to the General Editor of this series, and to all those who have so freely provided my photographic illustrations.

E. V. LANE

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CHAPTER I

DISCOVERY AND EXPLORATION

UP to the last decade of the fifteenth century the world known to the peoples of Europe was only about one-third of the total land area of the globe. Their knowledge of Europe itself was fairly sound, but of Asia it was vague, and of Africa little was known except the northern and western coasts. The Americas, Australasia, and the great scattered island world of the Pacific were all unknown. It is true that several centuries before this time the Norsemen had learnt something of Eastern North America, but this knowledge had been virtually lost. Our first real contact with the Americas dates from the voyages of Columbus and those who followed him in the late fifteenth and early sixteenth centuries. In order to understand how it was that Columbus came to make his celebrated voyages of discovery it is necessary to know something of the history of his day.

From a very early period there had been a considerable volume of trade carried on between Europe and Asia. From Arabia came "gold, and frankincense, and myrrh," ; India sent its precious stones, metals, silks, and cottons; China too sent silks; while from the distant East Indies came spices—cloves, ginger, nutmeg, and pepper. It is important to appreciate the value of spices in medieval Europe. Transport was both difficult and costly, so that any region was almost wholly restricted to the food-supplies of its own immediate surroundings. Lack of suitable fodder made it necessary to kill off most of the

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cattle before winter, and the meat was preserved by salting or drying. One can see that the diet of the Middle Ages was inclined to be monotonous, and to give some variety to dishes and render them more appetizing spices were commonly employed.

The great bulk of Eastern commodities came to Mediterranean Europe by a combination of sea- and land-routes. For example, goods were conveyed by Arab ships from the ports of India and Ceylon across the Arabian Sea and up the Persian Gulf to the great rivers of Mesopotamia, where lay the great city of Bagdad, and whence camel caravans conveyed the precious merchandise over the Syrian Desert to the ancient trading city of Damascus. Part of the trade reached Europe also through ports like Trebizond, on the southern shores of the Black Sea, and Constantinople, or through Cairo and Alexandria after conveyance along the Red Sea.

During the thirteenth century the Tartars or Mongols of Central Asia began a series of conquests that ultimately placed under the control of their greatest ruler, Kublai Khan (1260-94), the immense territory stretching from Peking—the centre of government—in the Far East to approximately the western boundary of European Russia. Kublai Khan was a most cultured, enlightened, and tolerant man. Within his dominions traders and travellers of all nations and religions were free to journey where-soever they pleased. Thus for the first time in history the Far East came into real contact with Europe. The most famous of the medieval travellers was a Venetian merchant, Marco Polo, who as a young man accompanied his father and uncle on their second journey to Peking. They set out from Venice in 1271, and followed the silk-trade route through Central Asia, reaching Peking in 1275, after a long and trying journey over the Pamirs and across the Gobi Desert. During the seventeen years of their residence at the Court of Kublai Khan Marco Polo had ample opportunities for studying the cities, peoples,

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and products of the Far East. When at last he returned to Venice in 1295, having accomplished most of the journey in trading vessels, visiting Java, Sumatra, and Ceylon on the way, he wrote a full and intensely interesting account of all that he had learnt of Cathay a (China), Cipango (Japan), the Thousand Islands (Malay Archipelago), Ceylon, and Tibet.

This definite knowledge of the great wealth of Asia stimulated the ancient Eastern trade. But when, the Mongol Empire broke up after the death of Kublai Khan (1294) the old freedom of trade suffered certain restrictions. By the fifteenth century the trading-routes through the Land of the Five Seas had fallen into the hands of the Turks, who proceeded to exact tribute from merchandise passing along to Europe. The Arabs too, who controlled the sea-borne traffic of the Indian Ocean, were not averse to profiteering, and as the final links in the chain of Asiatic trade were in the hands of the Venetians it is not surprising that peoples like the Portuguese and Spaniards were jealous of the Venetian monopoly and irritated by the exactions of the Eastern traders. Hence there arose a growing conviction that other routes must be sought to the East, and many circumstances combined to make such discoveries possible.

The experienced and skilful navigators and boat-builders of Venice and Genoa had steadily brought about improvements in the size and equipment of vessels; decks were added for the protection of merchandise and men; sails became more important than oars. Reliance upon simple observations of the sun and stars in guiding their ships had formerly compelled mariners to keep in touch with the coast—to launch out into the unknown sea was to risk disaster. But as a result of contact with the Tartars Europe had acquired knowledge of certain inventions long employed by the Chinese. Of these the most important were the magnetic compass, which the skilful Italians converted into a reliable instrument for direction-finding, gun-

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powder, which enabled Europeans to exercise a clear mastery over primitive peoples, and the arts of printing and paper-making, which made it possible to spread abroad throughout Europe valuable knowledge of all kinds.

Throughout almost the whole of the fifteenth century the Portuguese, inspired and directed by Prince Henry, appropriately called "the Navigator/" tried to learn more of the vast continent that lay to the south—Africa—and also to find a new route to the Indies, a route that would belong to Portugal. Prince Henry had three motives: a pure love of discovery and adventure, a strong belief in the possibility of getting by sea to India and the Far East, and a burning desire to convert to Christianity the heathen peoples encountered by his expeditions. Most of his navigators, however, were probably attracted chiefly by stories of the fabulous wealth of Asia. The first expedition of Prince Henry set out in 1418, and by the time of his death in 1460 about two thousand miles of the West African coast, almost to Sierra Leone, had been explored. Subsequently each Portuguese captain took with him a stone pillar, marked with a cross and his name, and he was fired with an intense desire to set up his pillar farther away from Portugal than any other navigator had done. Yet it was not until the end of 1486 that Bartholomew Diaz rounded the Cape of Good Hope, and over ten years more passed by before Vasco da Gama accomplished the first voyage to India round the Cape. The chief reason for the slowness of the Portuguese in their attempts to sail round Africa was that her navigators followed the coast, afraid to undertake the risks of venturing too far from the shore. To Columbus belongs the honour of overcoming that fear and proving the possibility of long voyages across the open ocean, where the winds, especially the steady trades, were more favourable to progress than in the sheltered coastal waters. Indeed, Vasco da Gama, sent out by the Portuguese king to complete the work of Prince Henry and so

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forestall the Spaniards in their attempts to reach the Spice Islands, followed the example of Columbus, and sailed far out into the Atlantic after passing Cape Verde in order to avoid the currents, calms, and uncertain winds of the Gulf of Guinea.

Before 1492 the Atlantic Ocean was a great unknown barrier, into which even the boldest of sailors feared to venture, lest strong winds and currents carry his vessel far away from land, never to return. After 1492 the Atlantic was to become not a barrier, but a highway, linking together two worlds.

Christopher Columbus was born at Genoa, and after a sound education went to sea at the age of fourteen. In the ships of Genoa and, from 1474, of Portugal he had wide experience of navigation, visiting all parts of the Mediterranean Sea and travelling north probably as far as Iceland and south to the newly discovered islands and coasts of West Africa. Not only did he become one of the finest navigators in Europe, but he made a constant study of any geographical books he could obtain. The majority of the people of his day believed the earth to be flat, a common idea being that it was a disk, with its centre in or near Jerusalem, encircled by a broad belt of unbroken ocean. This belief was certainly true to the extent that the Old World is indeed surrounded by an ocean belt: Arctic, Atlantic, Indian, Pacific. Columbus, however, as a result of his studies became convinced that the world was actually a sphere, and that it was possible to reach China and India by sailing westward across the Atlantic instead of attempting the long, wearisome journey eastward round Africa. The intelligent Greek geographers of Alexandria had many centuries before expressed their conviction that mankind was living upon a sphere; one of them (Eratosthenes) had, in fact, estimated the circumference of the earth with a wonderful degree of accuracy—about 250 years B.C.! This knowledge of the earth's shape and size had been lost until the newly introduced art of printing

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brought it once more before the minds of thoughtful men like Columbus.

Europeans had learnt something of Far Eastern Asia, but lack of suitable instruments prevented their gaining anything like an accurate knowledge of its extent from west to east. Hence Columbus readily believed what he read in one of his books, that "the sea between India and Spain is but a comparatively narrow strip running north and south." This belief is said to have been strengthened (but there is no definite proof) by the writings of Paul Toscanelli, a doctor and geographer of Florence, in Italy. Toscanelli, following the ideas of the ancient Greek geographer Ptolemy, described how one might reach the Far East by sailing westward. Like all good geographers, Toscanelli illustrated his account with a map, indicating that Eastern Asia lay rather less than 4000 miles west of Europe, and that there existed in the ocean a series of islands—the Canarios, Antilia,¹ Cipango (Japan)—forming convenient stepping-stones on the way to Cathaya (China). The details shown on Toscanelli's map were reproduced on a globe made in 1492 by Martin Behaim, a friend of Columbus, who was aware of still more definite evidences of unknown lands lying west of Europe, for at different times timber, canes, and seeds from tropical lands, and on one occasion the bodies of two men quite unlike Europeans had been washed ashore by the westerly winds and currents.

Columbus lacked one thing only: the money necessary to provide ships, men, and equipment. Failing to gain the support of the Senate of his native Genoa or that of King John II of Portugal, he spent long years of bitter disappointment in Spain, only to find his cherished ambitions the subject of mocking scorn and unbelief. King Ferdinand and his Queen, Isabella, who jointly ruled the united kingdoms of Aragon and Castile, were probably too intent

¹ "Antilia" survives in the names Greater and Lesser Antilles, applied to the West Indian islands.

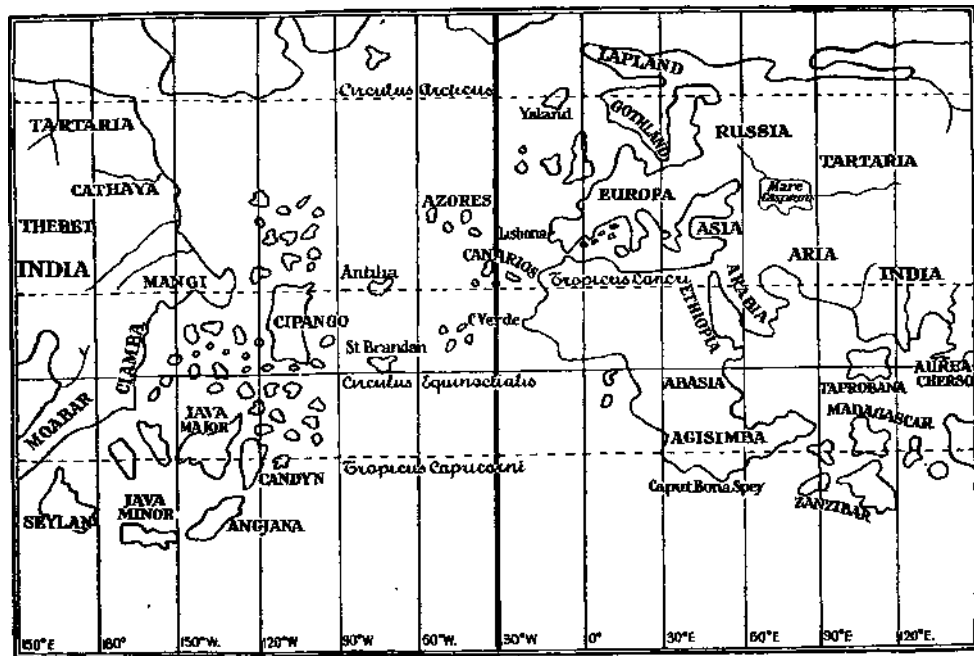


FIG 2 THE 'WORLD AS SHOWN ON MARTIN BEHAIM'S GLOBE (1492), WITH MODERN MERIDIANS ADDED

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The original globe may be seen in the Town Hall of Nuremberg, Bavaria. It was based upon the map of Toscanelli, which in its turn repeated the ideas of the Greek geographer Ptolemy (about A.D. 150), especially in over-estimating the west-east extent of Euro-Asia.

Most of the place-names are readily recognizable. Some of the unfamiliar ones follow: Ana = part of Persia; Aurea Cherso (Chersonesus) = Malay Peninsula; Caput Bona Spey = Cape of Good Hope; Cathaya = China; Cipango = Japan; Taprobana = Ceylon; Ysland = Iceland; St Brandon—supposed to have been discovered by an early Irish saint.

The line of longitude running through the Canary Islands was taken by the ancients as 0° , since those islands marked the western limit of the known world.

Observe the enormous eastward extension of Asia. Japan is indicated as lying a little over 100° W., instead of over 130° E.—that is to say, about twice as far eastward of Western Europe as it really lies. No wonder Columbus thought he had reached the Indies! The existence of America was obviously not known.

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upon expelling the Moorish invaders from Spain to feel interested in exploration across an unknown ocean. At last, however, the Moorish occupation of Spain, that had endured for nearly eight hundred years, came to an end, and, mainly owing to the influence of Isabella, it was

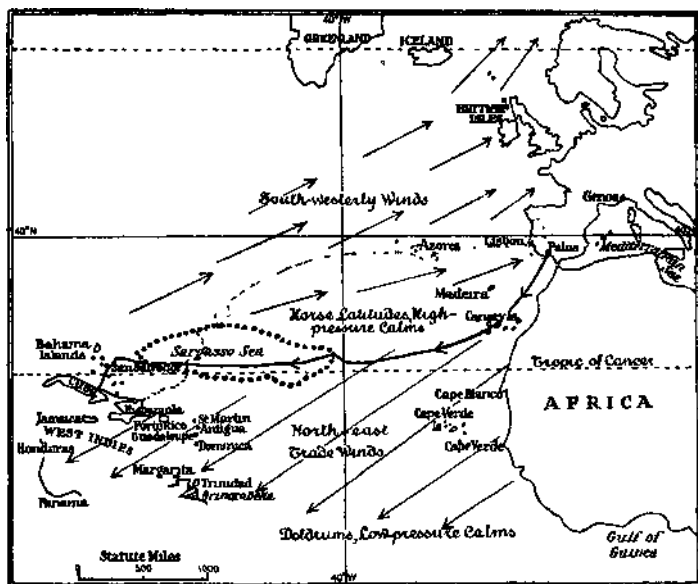


FIG. 3. THE FIRST VOYAGE OF COLUMBUS, 1492-93

The outward voyage is shown by a continuous line, the home journey by a dotted line.

Observe the way in which Columbus made use of the winds.

Only those portions of America that became known to Columbus during his four voyages are marked on this map. One can understand why he failed to realize that he had discovered a new continent, but rather believed that China and India were within reach if only he could find a channel leading to the west.

decided that Columbus should have the chance of testing his beliefs in the westward route to Asia.

Having collected together with considerable difficulty a very mixed crew, Columbus set sail on Friday, August 3, 1492, from Palos, a small port in South-western Spain. Although he had the high-sounding ranks of Admiral and

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Viceroy of all new seas and lands that he might discover, yet under his command he had only three small ships, the *Santa Maria* (100 tons), the *Pinta* (50 tons), and the *Nina* (40 tons), the total number of the three crews being only eighty-eight. In accordance with his plan, he first made for the Canary Islands—the first stepping-stone—which he reached on August 13. After a month of further preparation the three ships finally left the shores of the Old World and, carried along by the steady north-east trades, sailed into the unknown west. It is difficult for us to realize the growing terror of the crews as day followed day with still no signs of land, and when their vessels ploughed through the floating weeds of the strange Sargasso Sea it required all the steadfast faith and determination of their leader to prevent mutiny. Nor can we imagine the intense relief and joy when, following the sight of land birds and floating vegetation, at dawn on October 12 a low, flat island, clad with bright grasses and trees, was clearly visible. Columbus landed with the royal standard of Spain and a large cross, and, falling upon his knees, rendered thanks to God for the safe and triumphant ending of his perilous voyage. Had Columbus kept to his original course he would have reached Florida; as it was, a change of direction had brought him a little to the south-west, to the Bahamas, an extensive group of low coral islands. To the island on which he landed he gave the name San Salvador ('Holy Saviour'). It is generally accepted as the one now called Watling Island.

The Spaniards soon made friends with the natives, who at first had fled in astonishment and fear. Under their direction Columbus sailed from island to island, touching Northern Cuba and then Haiti, ever seeking the gold and spices of the Far East. So convinced was he that he had reached the Indies that he called the natives "Indians," a mistaken name that has been adopted ever since for all the native peoples of the Americas.

Owing to the wreck of his largest vessel, the *Santa Maria*,

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on Christmas Day, it became necessary to leave behind a fortified settlement of thirty-eight Spaniards in Haiti, an island to which he gave the name of Hispaniola ('Little Spain'). In January 1493 the *Pinta* and *Nina* set sail on the return voyage to Europe. Making good use of past experience, Columbus steered to the north-east, where the westerly winds, despite two dangerous periods of stormy weather (for at this, the winter season, the westerlies would be at their strongest, besides blowing in more southerly latitudes than in summer), carried his vessels to the Azores, and finally to Lisbon, where they arrived on March 4, 1493, returning to their starting-point, Palos, eleven days later. The journey overland through Seville to Barcelona, where the King and Queen welcomed him, was for Columbus a veritable triumphal progress.

Six months later, in September 1493, Columbus set out once more on his quest, in command of a fleet of three fairly large vessels (each about 420 tons burden) and fourteen smaller craft. In contrast to the first voyage, there was no difficulty in securing the necessary crews, numbering in all over a thousand. Following the same course as before, the great discoverer first reached Dominica ('Sunday') Island, whence he steered north-westward in order to reach Hispaniola (Haiti), observing and naming islands like Guadeloupe, Antigua, St Martin, and St John the Baptist (now called Porto Rico) that lay on his course. It was found that the small colony in Haiti had been wiped out by disease and hostile natives, so Columbus founded another settlement, called Isabella in honour of the Queen. Setting sail once more with three ships in search of China, which he believed to be quite near, Columbus discovered Jamaica, explored the coasts of Cuba, and at last, stricken down by fever, returned to the Isabella settlement. On recovering he returned to Spain, entering the harbour of Cadiz in June 1496.

In 1498 Columbus set out on his third voyage, in which he sailed on a more southerly course, hoping to find land

DISCOVERY AND EXPLORATION

south of the West Indies. Discovering and naming the island of Trinidad ('Trinity'), he sighted and sailed along the coast of South America, past the Orinoco delta, and as far as Margarita ('Pearl') Island before striking north-westward for Haiti. Here he found the colony in a state of chaos, and ere long an official, sent from Spain to investigate complaints brought home by certain settlers, arrested the great navigator, put him in chains, and dispatched him to Spain.

Disappointed and broken in health, Columbus was permitted in 1502 to make one more voyage to find the sea-channel that he still believed would carry him to Eastern Asia. Forbidden to land in Haiti, he sailed farther west to Honduras, and then followed the coast in a general southerly direction as far as the Isthmus of Panamd. By this time bad weather, ill-health, and despair of finding the route he sought made him give up the quest and return home. Reaching Spain in 1504, he found that his staunchest supporter, Queen Isabella, was dead. The hero himself, shattered by hardships of body and disappointments of mind so long endured, only survived until 1506, when he died at Valladolid.

Christopher Columbus never knew that he had discovered a new continent, and that a vast, unknown ocean separated his West Indies from the true East Indies. Those who followed his lead also sought the new route to Asia, and some time elapsed before men grasped the full significance of the true facts. A Florentine merchant resident in Cadiz, Amerigo Vespucci, who had supplied provisions to Columbus, appears to have been the first man to call attention to the existence of the new continent. Vespucci first visited the new lands in 1499, when he accompanied Hojeda, a young Spaniard who had taken part in the second voyage of Columbus. As a result of his explorations of the north-eastern shores of South America Vespucci was convinced that it was a New World, lying between Europe and the Far East. Then in 1507 a German

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professor, Waldseemiiller, published a book in Latin called *Cosmographies Introductio* (*An Introduction to Cosmography*), in which he included some of the letters of Amerigo Vespucci, and added the suggestion, both in words and—more important still—on a map, that the New World should be called America after this observant voyager. Waldseemuller's book had a wide circulation, and the name America came to be generally adopted.

It will be seen that Spain and Portugal were alike engaged in extensive exploration and discovery, the one to the west, the other to the east. It is not surprising to find, therefore, that in 1494 they signed the Treaty of Tordesillas, whereby, with the approval of the Pope, they agreed that all lands west of a meridian drawn about 48° west of Greenwich should be regarded as Spanish property, and lands east of that line as Portuguese. In 1500 Pedro Cabral, a Portuguese pilot who was endeavouring to repeat the voyage of Vasco da Gama to India, allowed the north-east trades to carry him well out into the ocean, and thus his vessels reached unknown land south of the equator. Since it lay east of the treaty line, it was claimed for Portugal.

Vasco Nunez de Balboa's accomplishment in 1513 of the difficult journey through the swamps, forests, and mountains of the Isthmus of Panama to the great ocean beyond probably confirmed Ferdinand Magellan in his belief that at last the western route to the Indies was revealed. Knowing something of the Far East from his own voyages with his countrymen the Portuguese, he soon persuaded the young Spanish King, Charles V, to fit out an expedition to sail into the newly discovered "South Sea," as Balboa had named it. Other explorers had already traced the greater part of the eastern coastline of South America, Juan Diaz de Solis having reached La Plata estuary—where he was killed and eaten by the natives!—in 1517. The task that remained was to continue this southward exploration until the extremity of the mainland had been reached.

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Port St Julian. **In** October (the southern spring-time) 1520 the search was continued, and very soon revealed a long, winding channel leading through to the ocean beyond. The passage of Magellan's Strait took over five weeks of dangerous navigation between intricate rocky coasts. On the south side the many fires of the natives caused the commander to name that region Tierra del Fuego ('Land of Fire'). Leaving behind the shores of South America, the course was set north-westward for the Spice Islands. The unusual calmness of the waters induced Magellan to give them the name of Pacific ('Peaceful') Ocean. After ninety-eight days of sailing through seemingly limitless seas the starved and diseased mariners reached a group of islands in the Western Pacific, to which Magellan gave the name Ladrones ('Robbers'), a reference to the thieving of the natives. Passing on to the Philippine Islands, the gallant navigator was killed in a skirmish with the natives. Eventually only one ship returned to Spain, in 1522, manned by eighteen sick, starving sailors, whom we honour as the first circumnavigators of the world.

The next navigator to encircle the globe was Sir Francis Drake, who left Plymouth in November 1577, and arrived back nearly three years later, in 1580. He went by Magellan's Strait, but, being blown southward in the Pacific, discovered the insularity of Tierra del Fuego. In many respects Drake's voyage resembled that of Magellan, except that the Englishman explored the west coast of South America, robbing Spanish treasure-ships at Valparaiso and other ports, and sailing almost as far north as Vancouver Island in Canada before he turned west across the Pacific.

Within fifty years of the first voyage of Columbus the coastline of the whole of South America was fairly well known. Knowledge of the vast territories of the interior was not so easily acquired, in view of the difficulties to be overcome.

The West Indies naturally provided a centre **from which**

.DISCOVERY AND EXPLORATION

the Spaniards could penetrate the mainland. Among the many leaders of expeditions two names stand above all others: Hernando Cortts and Francisco Pizarro.v/

Balboa had sighted the Pacific Ocean in 1513. Four years later Francisco Hernando de Cordova discovered Yucatan, and sailed along the coast to Campeachy Bay, the southern part of the Gulf of Mexico. In 1518 Juan Grijalva sailed still farther along the coast of Mexico to the site of Tampico, bringing back to Cuba news of the fabulous wealth of Mexico. So a small army of about 500 men was sent across under the command of Cortes. After establishing a suitable base—called Vera Cruz ('True Cross')—the Spaniards soon had ample evidence of the wealth of this new country, which they imagined to be one of the lands described by Marco Polo. Leaving Vera Cruz on August 16, 1519, the expedition crossed the low, hot, wet, unhealthy plains, and then had to endure the arduous ascent over the densely forested slopes, through the lofty mountain passes, where the native allies suffered from the cold, until at last they descended to the plateau beyond, lying at 7000 feet above the sea and not unlike Central Spain itself. Cortes and his men were welcomed and treated with every kindness by the civilized Aztecs and their ruler Montezuma, for Aztec legends spoke of the return of the bird-serpent god, accompanied by white-skinned men, to take possession of his old dominions. Cortes soon found occasion to seize Montezuma as hostage, and after severe fighting, in which the Spaniards proved themselves superior in weapons and military skill to forces many times their number, Mexico City was captured and the whole country quickly subdued.

Pizarro had accompanied Balboa across the isthmus to Panama, where they learnt of the great Inca Empire of Peru, rich in gold and silver. Inspired by Cortes' brilliant conquest of Mexico, Pizarro set out from Panama in February 1531, in command of an expedition of three ships, 180 soldiers, and thirty-six horses. Making their

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way over the difficult passes of the precipitous Andes, the Spaniards at last reached the high plateau beyond. Pizarro—copying the methods of Cortes—boldly seized the Inca Emperor, Atahualpa, accepted the ransom for his release—a room filled with gold—and then put him to death. As in Mexico, conquest was swift and complete—indeed, it was assisted by the civil wars that had been raging in the land—and very soon the wealth of Peru began to pour into Spain. In place of Cuzco, the Inca capital, Pizarro founded Lima, much nearer the sea and so more convenient as capital of a Spanish empire. Ecuador, to the north of Peru, was conquered in 1533, Bolivia, to the south, in 1538. Northern Chile was entered by Diego de Almagro in 1535, and the final conquest was accomplished in 1540 by Pedro de Valdivia, who penetrated the central valley.

A member of an expedition across the Andes led by Gonzalo Pizarro, brother of the conqueror of Peru, was destined to discover in 1541 the world's mightiest river, the Amazon. Lack of food caused Pizarro to dispatch his lieutenant, Francisco de Orellana, with fifty men in a boat to seek provisions lower down the river they had encountered. Finding no signs of cultivation or settlement, Orellana and his companions sailed on and on, deserting their commander, until at length, after many hardships and much fighting with native tribes, they reached the Atlantic Ocean, having completed a voyage of over 2000 miles. They finally followed the coast to Trinidad. They told stories of women warriors who fought as bravely as men, and so called the river the Amazons—a reference to the female warriors of ancient Greek legends.¹

One of the last efforts to find El Dorado—the Golden Land of easily acquired wealth that lured on so many explorers—was that of Sir Walter Raleigh, who in 1595 sailed up the river Orinoco, bringing back knowledge of Guiana

¹ Some authorities, however, consider the name to be derived from a native Indian word.

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and its possibilities, but failing to find the elusive land of fabulous wealth.

The whole of South America (with the exception of Brazil), Central America, Mexico, and the West Indies came under Spanish domination in less than half a century. Had the Spaniards acted wisely, they might still have been in possession of these great empires. But, thinking only of material wealth—gold and silver—they enslaved the unhappy natives and destroyed the wonderful civilizations of the plateaux; and even when attempts were made to develop the agricultural and other resources of these territories misrule, injustice, and inefficiency made even the Spanish settlers themselves bitterly hostile to their home country. During the Napoleonic wars, therefore, when Spain itself was in the hands of the French, most of the American territories seized the long-awaited opportunity to throw off the Spanish yoke and establish themselves as independent republics—like the United States—free to develop along their own lines. Callao, the last Spanish possession on the mainland, was lost in 1826.

_The-JBortugu^se-did not encounter the temptation of easily acquired wealth, and, with greater wisdom than the Spaniards, endeavoured to develop Brazil as a colony. They introduced African negro slaves to work on the plantations, and their treatment of the native peoples.was by no means harsh. But settlement proceeded slowly, since for some time they had to protect their coastal possessions not only from the warlike Indians of the interior, but also from the attempts of other European nations to gain a footing in the new land. During the Peninsular War the French invasion caused the Portuguese royal family to flee to Brazil, and in 1822 the Brazilian Empire was established as a separate state. This lasted until 1889, when Brazil became a federal republic.)

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EXERCISES

i. Write brief notes on the discoveries of (a) Columbus, (b) Magellan, (c) Pizarro.

2. Which do you consider the more important in its effects upon world trade and development, the discovery of America or the finding of the Cape route to India? Give your reasons.

CHAPTER II

THE SURFACE OF SOUTH AMERICA

SHAPE, SIZE, COASTS

SOUTH AMERICA is a pear-shaped continent, extending from about 12° N. (Cape Gallinas) to 55° S. (Cape Horn), so that four-fifths of the total area lie within the tropics. It should be noted that South America extends 20° farther south than Africa, which it resembles in shape and length, and over 10° farther south than Australia; yet no part of South America is more distant from the equator than is Newcastle-upon-Tyne in England.

In longitude South America stretches approximately between the meridians of 35° W. (Cape San Roque) and 80° W. (Cape Parifia). It is therefore almost wholly east of North America, so that its northern regions are actually nearer to South-western Europe than to the well-peopled parts of Eastern North America. In shape both North and South America are similar, broad in the north and tapering southward. In the case of North America, however, the bulk of the continent is outside the tropics, a fact that obviously has important results in many directions.

The greatest length of South America from north to south is about 4700 miles, and the breadth from west to east 3200 miles, the area being over 7,200,000 square miles, or sixty times that of the British Isles, and nearly twice that of Europe.

Like Africa and Australia, South America is a compact land-mass, with few projecting peninsulas and a regular coastline only three-quarters that of Europe in total length. The most irregular stretch of coast is that of Southern Chile, where subsidence has drowned the valleys

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and left the higher mountain ridges as islands. As such a large proportion of the coastline is backed by highlands that rise steeply the continental shelf¹ is extremely narrow in most parts. Only in the south-east is the shelf extensive, where it includes the Falkland Islands as the higher parts of the depressed region. Along the western coast good natural harbours or estuaries suitable for shipping are extremely rare.

STRUCTURE AND RELIEF

The general build of the continent is at once clear from a good relief map. There are three groups of highlands: the Andes and the Guiana and Brazilian plateaux, separated by the three great drainage basins of the Amazon, Parana-Paraguay, and Orinoco.

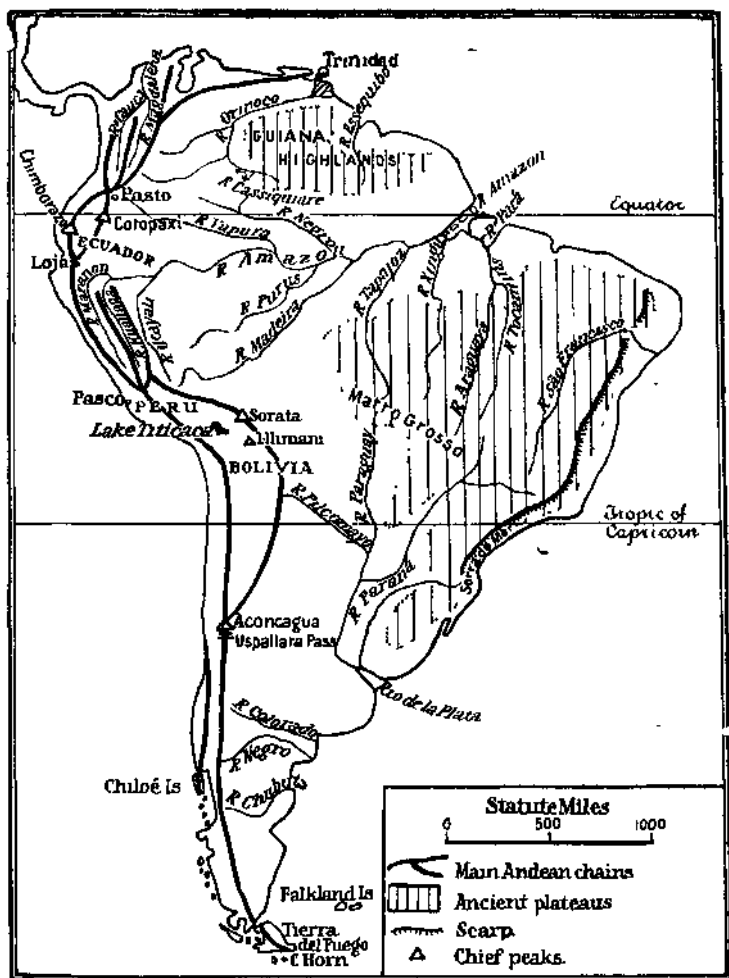
The proportion of lowland is greater than in any other continent but Europe, while the proportion of land over 10,000 feet above sea-level is greater than in any other continent.

The Atlantic highlands of Guiana and Brazil form the oldest part of the continent, and closely resemble the ancient plateaux of Africa, peninsular India (the Dekkan), and Western Australia. Indeed, these lands were probably joined together in past geological ages, forming an immense southern continent.

Both Brazilian and Guiana highlands consist of fairly horizontal strata of old sandstones lying upon still more ancient crystalline rocks. During countless ages these rocks have been denuded or worn down to much lower levels, and in many parts the sandstones have been completely removed. The existing scenery is mainly due to the work of rivers, which have produced dissected plateaux: there are large table-topped mountains, or *mesas*,²

¹ The continental shelf is the platform surrounding the continent covered by water no more than 100 fathoms (600 feet) in depth.

² *Mesa* (Spanish) = 'table.'



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

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separated by valleys carved out by the streams. Frequent faulting or fracturing has also helped to produce these isolated table-blocks. Like other highlands of ancient rocks, the Atlantic highlands of South America possess considerable mineral wealth. Large areas still await fuller exploration.

The Brazilian highlands are highest near the east coast, where they attain a height of over 10,000 feet, forming a steep slope or scarp facing the South Atlantic Ocean. Down this slope, known as the Serra¹ do Mar ('Mountains of the Sea') in the south, tumble many torrential rivers. The coast is very rugged, and abounds in beautiful bays, of which Rio de Janeiro² is the finest.

The Brazilian highlands descend inland by terraces to the plains of the Amazon and Parand-Paraguay. The rivers have cut out long, deep valleys, sometimes gorge-like in character. Some reach the plains by falls, but the Paran& and Tocantins give navigable access right into the heart of the highlands. The plateaux of Matto Grosso ('Great Woods') and Goyaz in the west form the water-divide between rivers flowing north to the Amazon or south to Rio de la Plata (the estuary of the Parand-Paraguay system), and are continuous with a plateau lying on the eastern flank of the Andes.

Only one long river, the Sao³ Francisco, reaches the Atlantic through the eastern edge of the plateau. The greater part of its course is navigable, but it drops to the coastal plain by the Paulo Affonso Falls.

The Guiana highlands are separated from those of Brazil, which they closely resemble, by the Amazon lowlands. The main difference is that the Guiana highlands attain their greatest height (10,000 feet) inland and descend in terraces to the broad coastal plain of the three

¹ Serra (Portuguese) is the same as *sierra* (Spanish), meaning 'saw-like,' whence the application to the irregular skyline of a mountain chain.

² 'January River.'

³ *Sao*, pronounced like 'soun' in the word 'sound,' is the Portuguese equivalent of the Spanish *san* = 'saint.'

THE SURFACE OF SOUTH AMERICA

Guiana colonies. The highest parts, the Sierra Pacaraima and Roraima (a huge, flat-topped plateau of red sandstone), form the watershed between rivers flowing to the Orinoco or Amazon or direct to the Atlantic. Most of these rivers are swift, their courses marked by gorges, falls, and rapids, and of little use as water-routes.

Along the eastern flank of the Southern Andes there extends another plateau belt, somewhat similar to but less elevated than those of Guiana and Brazil. The northern part forms the western portion of El Gran Chaco ('the Great Hunting-ground'). In Southern Argentina the plateau almost reaches the east coast, forming the plateau of Patagonia, descending to the sea in broad terraces, crossed by rivers like the Colorado, Negro, and Chubut. Many valleys contain lakes, held up by morainic dams left in the Ice Age, and a good deal of the region consists of a shingle desert.

The Andes, or Western Cordillera,¹ form the most prominent feature in the relief of South America. They are long, parallel chains of fold-mountains—gigantic 'waves' in the earth's crust—slowly pushed up while the bed of the Pacific Ocean was subsiding. They are *young* mountains—that is to say, they were formed quite late on in the geological history of the earth's surface as we know it to-day. We can tell this by their appearance of newness: they contain rocks (*e.g.*, limestones) once laid doWn under fairly deep seas at a much later period than the sandstones of the eastern highlands; the rocks of the Andes have not been worn down to any great extent, as have those of the much older Brazilian highlands; and those striking evidences of crustal movement—earthquakes and volcanic eruptions—are associated with the whole Andean region, stretching 6500 miles from Trinidad to Magellan Strait—the longest mountain system in the world. The average height of the wall-like ridges is about 14,000 feet above the

¹ *Cordillera*, pronounced 'kor-dil-ye'-ra,' is the Spanish for 'cord/ and is applied to long mountain chains.

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sea, but here and there at wide intervals volcanic domes of lava and ash have been built up on top of the ridges to much greater heights, forming the chief peaks. These peaks are high enough to be snow-capped even round the equator, where there are glaciers on the flanks of the highest summits. The scenery in the Western Cordillera is most imposing. There are swift rivers rushing through rocky gorges and forming magnificent falls as they drop to the plains below. The Andes throughout their length

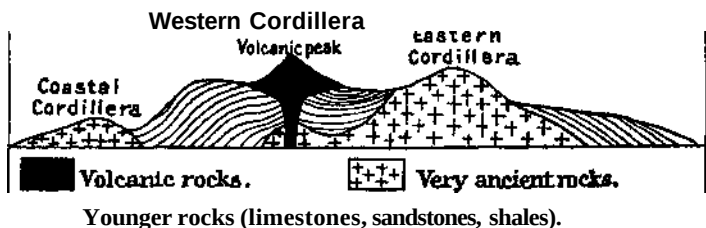


FIG. 6. WEST EAST SECTION ACROSS THE ANDES, ILLUSTRATING
THEIR STRUCTURE

from Colombia to Southern Chile form the watershed between rivers flowing to the Atlantic or Pacific.

The presence of two or more parallel ranges makes crossing a matter of supreme difficulty, especially so since most of the passes are very high: the Andes are a great barrier. Like the Western Cordillera of North America, they possess a great wealth of minerals. The presence of the Andean barrier and the flow of the great navigable rivers eastward have linked South America in development with the Atlantic rather than the Pacific Ocean.

We may divide the Western Cordillera of South America into three connected sections: Northern, Central, and Southern Andes.

i. *The Northern Andes.* North of the equator there are three well-marked chains, separated in Colombia by the

THE SURFACE OF SOUTH AMERICA

river Magdalena and its tributary the Cauca, which flow northward in longitudinal¹ valleys. The most easterly chain, the Sierra de Mérida, turns eastward, passing through Northern Venezuela into Trinidad, and we can trace the line of folding northward and then westward through the other West Indian islands.

A little north of the equator the three ranges converge into the mountain knot of Pasto, south of which lies the high plateau of Ecuador, or Quito (about 9000 feet), flanked by two higher ranges where volcanic cones like the extinct Chimborazo² (20,500 feet) in the western range and the still active Cotopaxi (19,600 feet) in the eastern range have been built up on top of the ridges by successive eruptions.

2. *The Central Andes.* From the knot of Loja, at the south end of the plateau of Ecuador, three main chains appear, the Cordillera Occidental ('Western'), Cordillera Central, and Cordillera Oriental ('Eastern'), separated by deep longitudinal valleys containing two northward-flowing headstreams of the Amazon: the Marañón and Huallaga. The three chains converge in the knot of Pasco, and continue south as two lofty chains, rising to well over 20,000 feet (Sorata, 21,500 feet, and Illimani, 21,000 feet, an extinct volcanic peak), enclosing the lofty plateau or puna of Peru and Bolivia, over 12,000 feet high and as much as 500 miles wide. This intermont or enclosed plateau is a basin of inland drainage, for it has no outlet to the open sea. It probably contained a vast lake at one time, but to-day only remnants remain, and these are slowly dwindling away by evaporation and filling in with silt from the streams. Lake Titicaca, 3200 square miles in area (about 570 times the area of Lake Windermere), is a freshwater lake, since a stream called the river Desaguadero

¹ A longitudinal valley runs parallel to the mountain chains; a transverse valley cuts across them.

² Chimborazo means 'Silver Bell,' a name which well describes the appearance of this volcanic dome, crowned with glaciers and snow.

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(the 'Drain') flows out of it to the south into Lake Poopo. The latter is salt; it has no outlet save evaporation, which removes only pure water and leaves behind all the dissolved mineral matter.

3. *The Southern Andes.* The two chains flanking the Bolivian plateau converge and are continued southward by one lofty chain, which rises in the extinct volcanic peak of Aconcagua to 23,080 feet—the highest mountain of all America. Immediately south of Aconcagua lies the Uspata or Cumbre Pass (12,800 feet), the most important in the whole Andean system, tunnelled by the only direct transcontinental railway of South America. This main chain is continued into the far south, getting gradually lower, and ceasing at Magellan's Strait. The southern portion was glaciated during the Ice Age, and resembles the Alps, with snowfields, glaciers, and long, deep lakes in the deepened valleys. There are many low passes.

Throughout most of its length the Andean system is flanked by lower coast ranges, in which both folding and faulting have played a part. They are generally separated by a longitudinal valley from the Andes. In places they are indistinct. Glaciation and subsidence in Southern Chile have produced a long archipelago and an intricate maze of long, winding fiords,¹ including the Strait of Magellan. The longitudinal valley is of course here beneath the sea. Farther north this valley can be clearly traced in the central valley of Chile and also in the Atacama Desert beyond. The coast range forms the high western and southern mountains of Tierra del Fuego, where there are many glacial lakes and fiords, with some glaciers still reaching down to sea-level.

The great plains of South America were long ago the site of vast seas stretching between the Atlantic highlands and the Andes. During the ages these seas have been gradually filled in by deep, rich sediments brought down

¹ A fiord is a drowned valley that has been deepened by the action of glaciers.

THE SURFACE OF SOUTH AMERICA

by the multitude of rivers rising in the surrounding highlands. The remarkable flatness of the three plains of the Orinoco, Amazon, and Parand-Paraguay is, of course, explained by their origin. The almost universal slope of the highlands from the coasts inland causes the drainage of the continent to collect into three great navigable river-systems, a fact of great importance in the development of South America.

THE GREAT RIVERS

I. The *Amazon* is not the longest river in the world, but it is undoubtedly the greatest, both in volume of waters and size of drainage basin, which is roughly as big as Europe. The main stream is formed by the junction of two rivers, the Marafion, whose source is a lake only 150 miles from the Pacific, and the Ucayali. On leaving the eastern foot of the Andes the Amazon flows eastward, and is continuously navigable for 3000 miles, ocean-going vessels being able to go from the Atlantic to Manaos, and even to Iquitos, on the Upper Amazon, in Peru (2000 miles from the Atlantic). Flowing through a region of equatorial rainfall, it is a broad, full river, with a great number of immense tributaries, such as the Madeira (the best for navigation), Tapajoz, Xingii, and Tocantins from the south, the Yapura and Negro from the north. In the rainy season, perhaps for six months or more, the rivers are very high, but their levels fall in the drier part of the year. In the last 250 miles of its course the Amazon is over 50 miles wide—more than twice the width of the Straits of Dover—and in many respects it resembles an inland sea rather than a river. In many places the flatness of its bed and the immense volume of water cause it to divide into paraltel channels, separated by forested islands. The Amazon enters the Atlantic in a huge estuary, where a delta is forming, one of the partially forested mud and sand banks, the island of Marajo, being as big as Scotland. The gentle slope of the bed and the size of the estuary allow

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the tides to come in strongly in the form of a tidal bore and penetrate well over 500 miles inland, while the current of the river itself is strong enough to be felt over 150 miles out in the Atlantic Ocean.

2. *Rio de la Plata*, or the *River Plate*, is the wide, rather shallow estuary into which flow the Parang, Paraguay, and Uruguay, with their many tributaries, bringing a volume of water only exceeded by that of the Amazon. The Parand, rising near the Tocantins, is regarded as the main stream, and is navigable throughout the greater part of its course. The Paraguay, which has several long tributaries from the Andes, rises near the Tapajoz, the land between their sources being so low that in the wet season they are flowing out from the same big shallow lake. The southerly direction of the Paraguay is continued until the Parana turns eastward to enter the Plata estuary. The Uruguay, flowing in a roughly semicircular course from the Serra do Mar, also enters the head of the same estuary, which is being gradually filled in by the great mass of sediment brought down by the rivers. These rivers are of greater value to man than the Amazon, since they pass through zones capable of varied development and much more suited to white settlement.

3. The *Orinoco* rises in the south-west of the Guiana highlands and circles round their western end, where it receives several long Andean tributaries, navigable to the foot of the mountains. Turning eastward, the Orinoco reaches the Atlantic in a great delta which lessens its importance for navigation. As is the case over most of the great lowlands of South America, water-divides are very low indeed, and a small tributary of the Orinoco, the Cassiquiare (over 200 miles long), is actually linked up with the Negro tributary of the Amazon. Except for a break where rapids occur about 600 miles from the sea, the Orinoco is navigable to the Guiana highlands, but the shallowness of the main stream and its tributaries during much of the year makes it of less value than the Amazon system.

THE SURFACE OF SOUTH AMERICA

EXERCISES

- i. On an outline map of South America record as many facts as possible concerning the size, position, and relief of the continent. Include the continental shelf.
2. Compare and contrast South America and Africa in position, relief, and rivers. Illustrate with simple sketch-maps.
3. Draw a section across South America along the Tropic of Capricorn. Insert names of highlands, rivers, etc.

CHAPTER III

THE CLIMATES OF SOUTH AMERICA

IN these days of broadcasting and daily forecasts in our newspapers we are all familiar with the term 'weather.' We may describe 'climate' as the average of the weather conditions. As one of the pioneers of modern geography—Dr A. J. Herbertson—put it so aptly, "Climate is what on an average we may expect, weather is what we actually get." By 'weather' we mean the general atmospheric conditions (temperature, sunshine, winds, rainfall, etc.) at some very definite time—for example, yesterday or last week. In 'climate' we speak of the average conditions over a long period.

We may conveniently study climate under the headings of (a) temperature and (b) rainfall, remembering, however, that the various branches that go to make up climate are all connected with one another.

TEMPERATURE

I. *January Conditions.* Study the map of January conditions and confirm the following points, noting that the map shows the isotherms expressed as though the whole continent were at sea-level.

January is typical of the southern summer, when the sun ranges between the Tropic of Capricorn and the equator. It is overhead at noon at the tropic on December 21, and at the equator on March 21 and September 23. Thus the hottest area in South America in January lies south of the equator and round the tropic, the average temperature exceeding 80° F. Actually the hottest regions

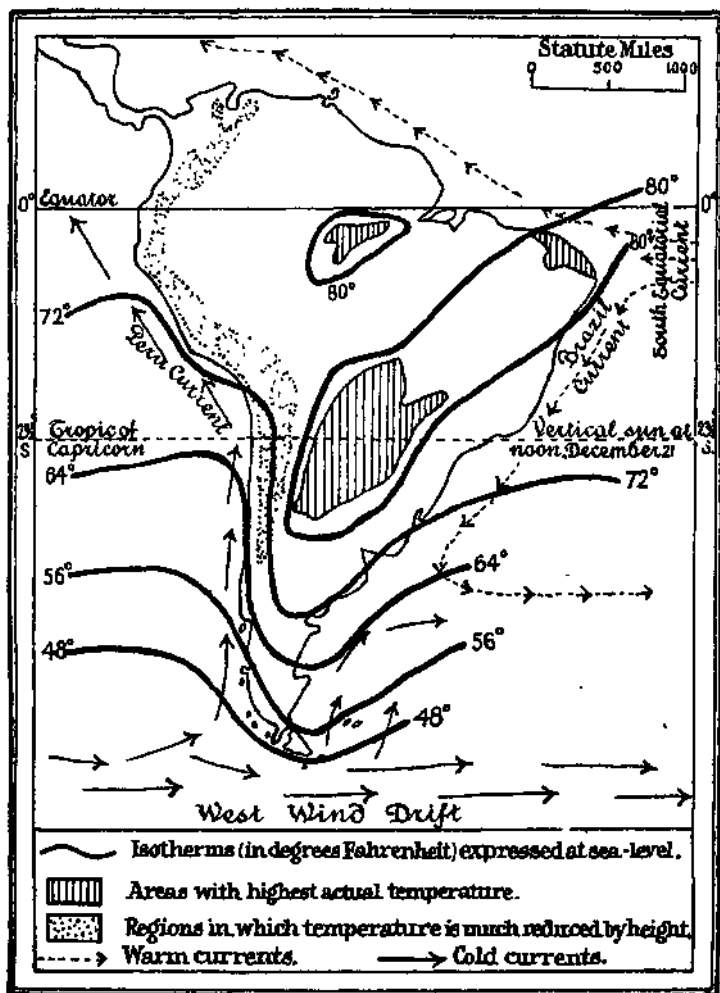


FIG. 7. JANUARY TEMPERATURE CONDITIONS: SOUTHERN SUMMER

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are the interior lowlands of the Parana-Paraguay basin, the eastern shoulder of Brazil, and the heart of the Amazon basin.

Southward the increasing slope of the sun's rays, owing to increasing distance from the tropic, results in a fairly regular fall in temperature.

The westerly winds of the Southern Ocean blow the surface waters in an easterly direction. Part of this west wind drift is turned northward along the west coast of South America, and, being driven onward by the south-east trade-winds, forms a strong, steady current of relatively cold waters. The driving along of the surface waters causes still colder waters from the ocean depths to well up and add to the volume of the current. The chilling effects of this Peru (or Humboldt) Current are apparent from the very pronounced northward bend of the isotherms on the west of the continent. The cooling effect is still very marked even in the Galapagos Islands, round the equator.

The east coast of Brazil is in strong contrast with the coasts of Peru and Chile in the same latitudes, owing to the added influence of the Brazil Current, which brings warm waters from the South Equatorial Current set up by the south-east trades blowing the waters against the equatorial shores of Brazil, from which they flow north and south.

The narrowness of the southern part of the continent and its exposure to the cooling influences of two vast oceans result in much cooler summers than those of other lands in similar latitudes. Tierra del Fuego, lying in a latitude corresponding with that of Northern England, has a summer temperature about 10° F. lower.

2. *July Conditions.* Examine the map of July temperature conditions. July is the typical month of the southern winter, when the sun has moved beyond the equator to the northern Tropic of Cancer, where it is overhead at noon on June 21. The hottest regions (over 80° F.) are the plains of the northern Amazon lowlands, the Orinoco basin, and all the northern coastal plains.

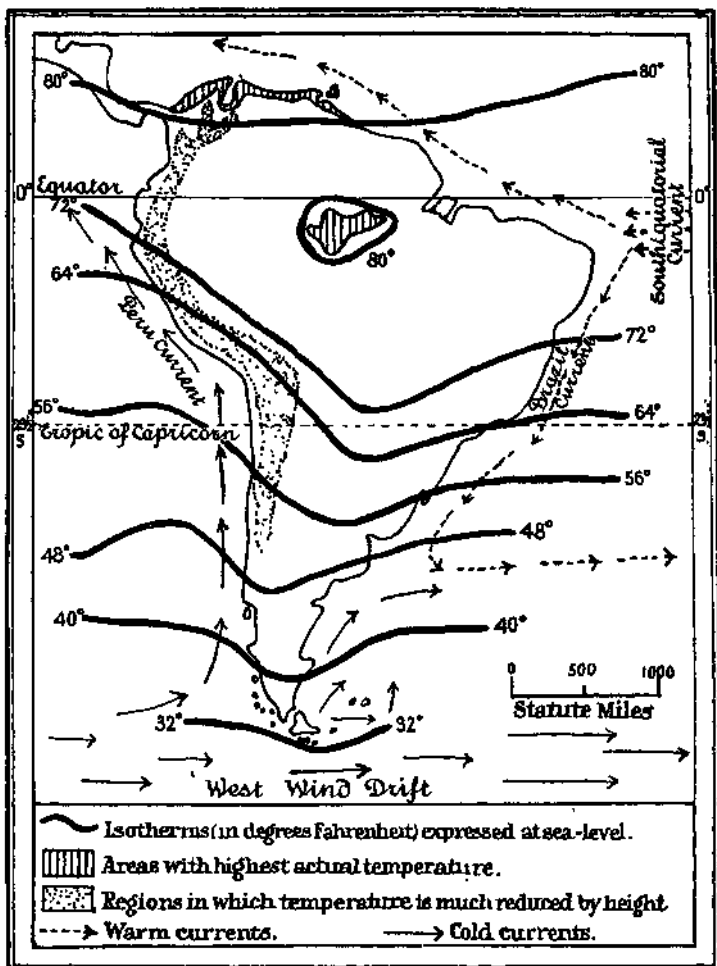


FIG. 8. JULY TEMPERATURE CONDITIONS. SOUTHERN WINTER

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The northerly bend of the isotherms is still apparent in the west, but is not so marked as in January, since the differences between land and sea temperatures are less.

Southern Chile has about the same temperature in July (under 40° F.) as Southern Britain in the corresponding latitude has in January. On the whole, except in Tierra del Fuego, the winters of South America are nowhere so cold as in the major portion of the British Isles.

3. *General Conclusions.* No parts of South America have a really extreme climate. In the north, where the broadest part of the continent lies within the tropics, the seasonal range is small, the temperature being always high. Round the equator there is almost equal heating throughout the year, for the sun is never far from vertical at noon and always shines for the same period of twelve hours. The temperature in the equatorial lowlands is therefore approximately 80° F. every month. The continent tapers so much south of the Tropic of Capricorn that no part is so far from the sea as to have an extreme continental climate.

The maximum range of temperature, about 30° F. (similar to that of the Paris basin in France), is found in Northern Argentina.

The influence of altitude must be remembered. There is a fall in temperature of about 1° F. for every 300 feet on a mountain, but the reduction is rather less than this on plateaux and great mountain ranges. Temperature conditions in the Andes vary much more in accordance with height than with latitude. Quito, for example, almost on the equator and at a height of 9300 feet, has a temperature about 25° F. below that of the Amazon lowlands, and the highest parts of the equatorial Andes are clad in eternal snows.

RAINFALL

In studying the rainfall of South America we have to observe the combined effects of the distribution of pressure, winds, and highlands.

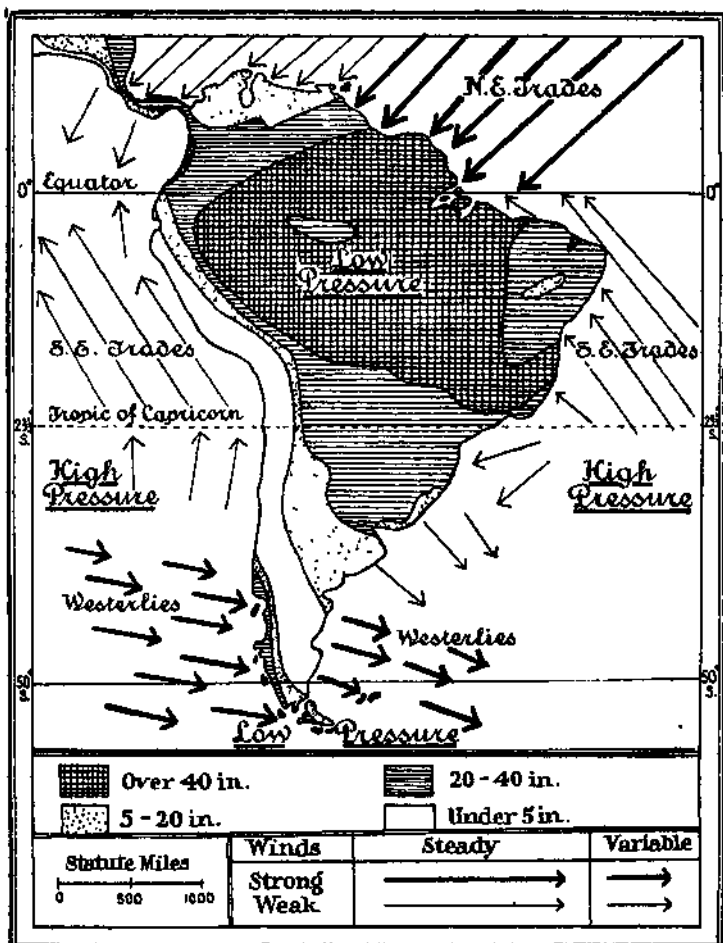


FIG. 9. RAINFALL FROM NOVEMBER 1 TO APRIL 30
(SOUTHERN SUMMER)

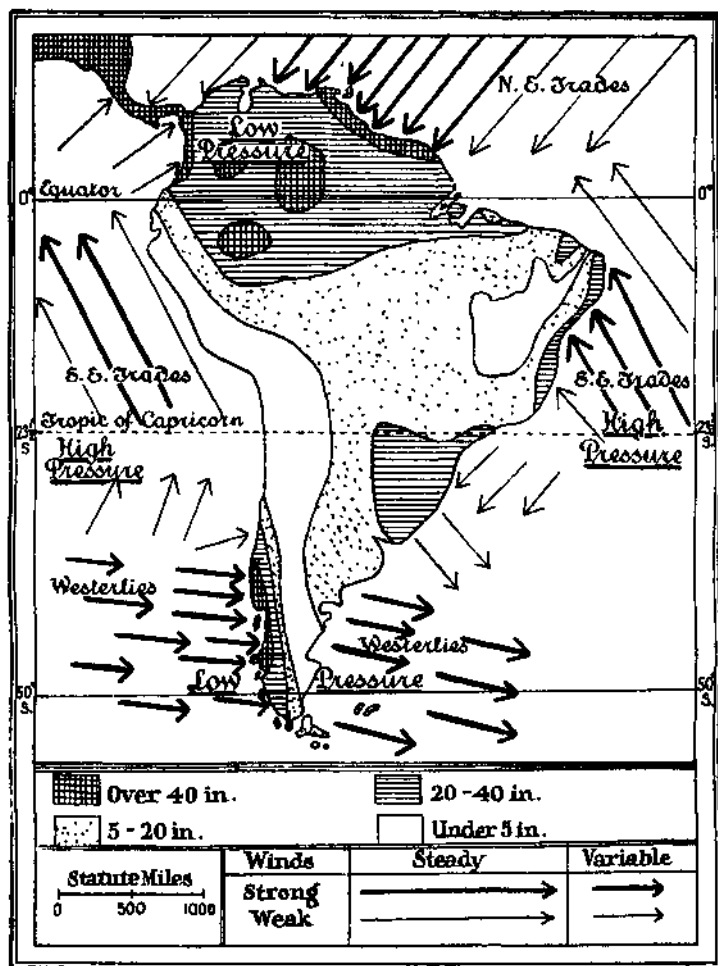


FIG 10. RAINFALL FROM MAY 1 TO OCTOBER 31
(SOUTHERN WINTER)

THE CLIMATES OF SOUTH AMERICA

Examine the rainfall maps and notice the following features. Blowing toward the equator there are the north-east and south-east trades, which, having crossed the vast expanse of the Atlantic Ocean, are carrying great quantities of water-vapour. This will be condensed into rain only if the winds are compelled to rise, and so expand and cool. The three great mountain areas—especially the Andes and the steep eastern face of the Brazilian highlands—are obviously very wet on their slopes facing the Atlantic Ocean.

The wide openings between the highlands allow the trades to penetrate into the Amazon lowlands, where steadily rising air-currents result in heavy rainfall. During much of the year there is rainfall almost daily. Heavy clouds form during the middle part of the day, and the afternoon witnesses the usual equatorial storm, with crashing thunder, vivid lightning, and torrential downpours of rain.

The equatorial rain-belt follows the apparent movement of the sun, northward in our summer, southward in the summer of the Southern Hemisphere. This movement is revealed very clearly in the first two rainfall maps. There is a strong contrast between the wet summers and much drier winters in Venezuela north of the equator, and in the southern part of the Brazilian highlands (South-east Brazil, Paraguay, and Uruguay) south of the equator. Summer rainfall is a very marked feature over most of South America, being due to rising air-currents on the heated land—a kind of monsoon climate.

The region round the Rio de la Plata lies near the fringe of the south-east trades, and so gets rather more rain in the summer half of the year, when these winds are blowing farthest south, although much of the rainfall all the year is from cyclones, or 'depressions' similar to those which are responsible for so much of our own rainfall and changeable weather.

South of latitude 40° S. the westerly winds blow strongly all the year on to the coasts of Southern Chile, bringing

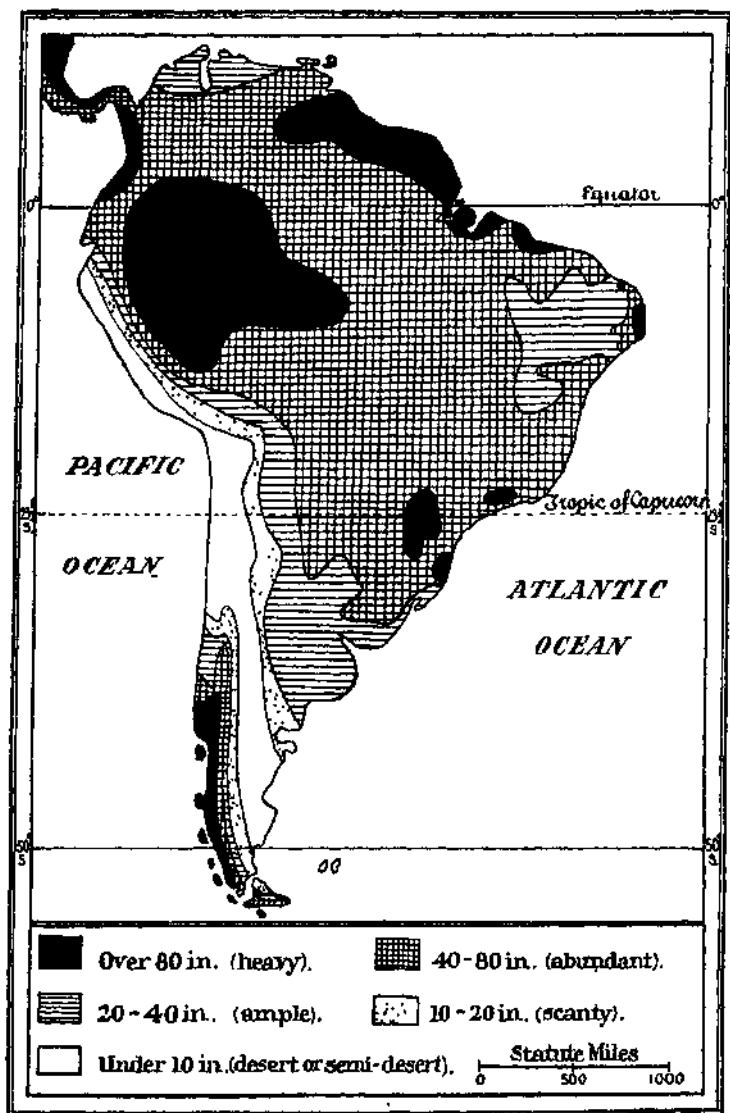


FIG 11. MEAN ANNUAL RAINFALL

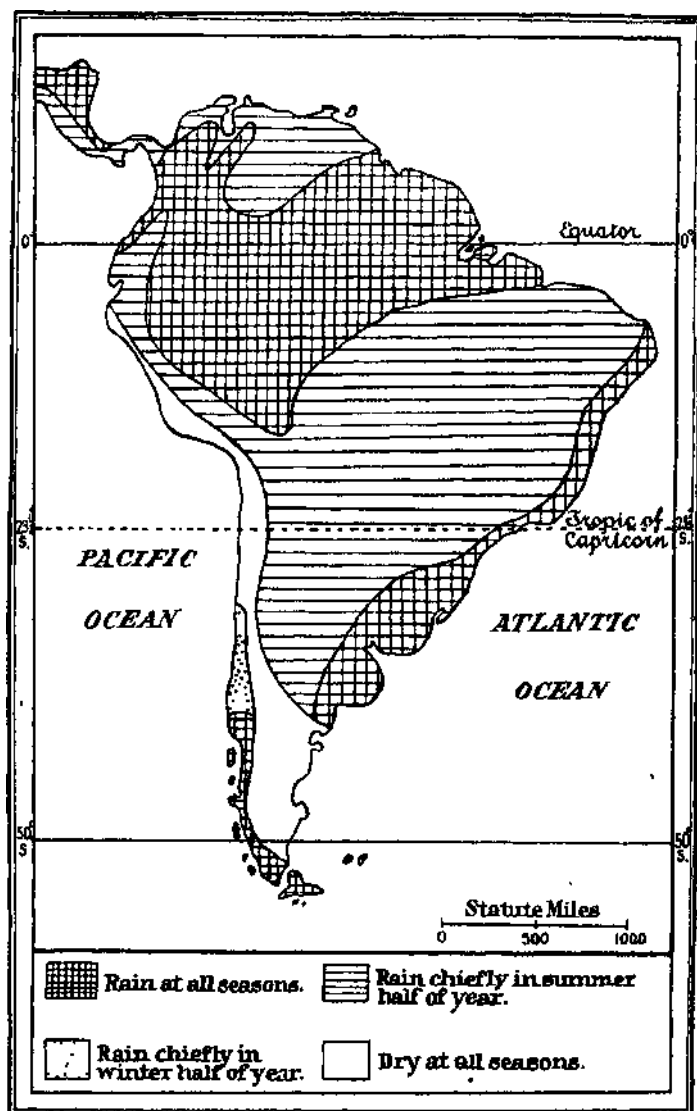


FIG. 12. THE SEASONAL DISTRIBUTION OF RAINFALL

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heavy rains from the Pacific Ocean. In winter their northward movement gives a wet season to Central Chile as far north as 30° S. These westerly winds are sometimes called "the Roaring Forties"—a reference to their storminess and their latitude—or "the brave west winds." The absence of great land-masses in the cool temperate latitudes of the Southern Hemisphere allows them to develop greater strength and constancy than the corresponding winds of the Northern Hemisphere.

The Andes form an important climatic barrier. By shutting out the south-east trades from the east they cause the desert which extends from the Gulf of Guayaquil through the coastal belt of Peru and as far south as 30° S. in Chile. The cold Peruvian Current chills any winds blowing toward the west coast, so that fogs, mists, and clouds are frequent, but practically no rain falls on the land.

In the extreme south the Andes cause the rain-shadow of Patagonia, where strong westerly winds blow across the mountains, but bring little rainfall.

The high Andean plateaux of Peru and Bolivia receive very little rainfall (or snow), owing to the higher ranges on their flanks.

EXERCISES

MEAN MONTHLY TEMPERATURES (DEGREES FAHRENHEIT) ¹

PLACE	J.	F.	M.	A.	My.	Jun.	Jy.	Aug.	S.	O.	N	D.
Manaos .	80-6	80*4	80-41	80 4	80.4	80.8	81.1	82.0	82.4	82.9	82.6	81.0
Iquique .	70-7	70.9	69-0	64.8	62.7	61.8	59.5	61.2	62.5	63.9	66.6	69.4
Rio de Janeiro	77.5	78-1	77.2	74.1	70.		67 5	68.7	69.4	71.2	73.4	74.8
Santiago.	67-7	66.8	63.2	56.7	51.	48.3	46.9	48.4	54.5	56.3	61.3	65.2
1 Valdivia .	59.5	58-9	56-6	53.5	51.4	48.5	46.0	46.3	49.3	51.1	53.2	56.6
Bogota .	57.6	57.9	58.6	58.6	1.5	58.1	57.2	57.0	57.0	57.9	58.3	58.1

¹ From W. G. Kendrew's *Climates of the Continents*.

THE CLIMATES OF SOUTH AMERICA

MEAN MONTHLY RAINFALL (INCHES) ^x

PLACE	J.	F.	M.	A.	My.	Jn.	Jy.	Aug.	S.	O.	N.	D.	ANNUAL TOTAL
Mangos .	8.3	8.0	8.1	8.4	6.6	3.9	1.8	1*3	2.2	4-6,4	5	8.2	65.9
Iquique.	0	0	0	0	0	0	0'02	0	0.03	0	0	0	0.05
Rio de Janeiro	5-0	4.3	5.3	4.4	3.5	2.0	1.6			3.2	4.3	5.4	43.4
* Santiago	0	0.1	0.2	0.0	2.3	3.2	3*4	2.4	1.2	0.6	0.2	0.2	14.4
Valdivia	2-9	3.2	6.49	3	15.3	17.5	15*4	13.5	7.3	5.0	4.4	4.8	105
Bogota .	37	3.5	4.5	9.6	6.5	3.2	2.6	3.3	2.9	8.49	6	5.6	63.4

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

2. Briefly describe and explain the climate of each town.

3. Contrast the climates of Iquique and Rio de Janeiro.

4. If South America were turned round, so that Tierra del Fuego occupied the present position of Trinidad, what important climatic changes would result?

¹ From W. G. Kendrew's *Climates of the Continents*

CHAPTER IV

THE NATURAL VEGETATION OF SOUTH AMERICA

PLANT life depends in the main upon three factors: water, heat, soil. Soil varies so much that it can only be taken into account in considering local differences in plant life. It is the supply of water—the vital necessity for plants as for animals—that determines whether there shall be forests, grasslands, or deserts. The temperature conditions decide the particular kind of forests, grasslands, or deserts: whether they shall be of tropical, temperate, or cold type.

The map showing the distribution of natural vegetation shows the kind of plant life that was found in each particular region before man had interfered. The map may thus be regarded as a summary of the facts already learnt regarding relief, temperature, and rainfall.

THE FORESTS

Trees require considerable quantities of water in the subsoil, where their roots spread. Where rainfall is abundant throughout the greater part of the year forests may be expected. In densely peopled and well-developed lands like those of Western Europe the greater part of the forests, has been swept away long ago. But in South America the efforts of man have effected very little change so far, and the continent as a whole appears as Nature made it.

I. *The Equatorial Forests.* All over the immense area of the Amazon lowlands, and even on the lower slopes of the surrounding highlands, the perpetual supply of water, the high temperature, and the rich, deep soil provide ideal

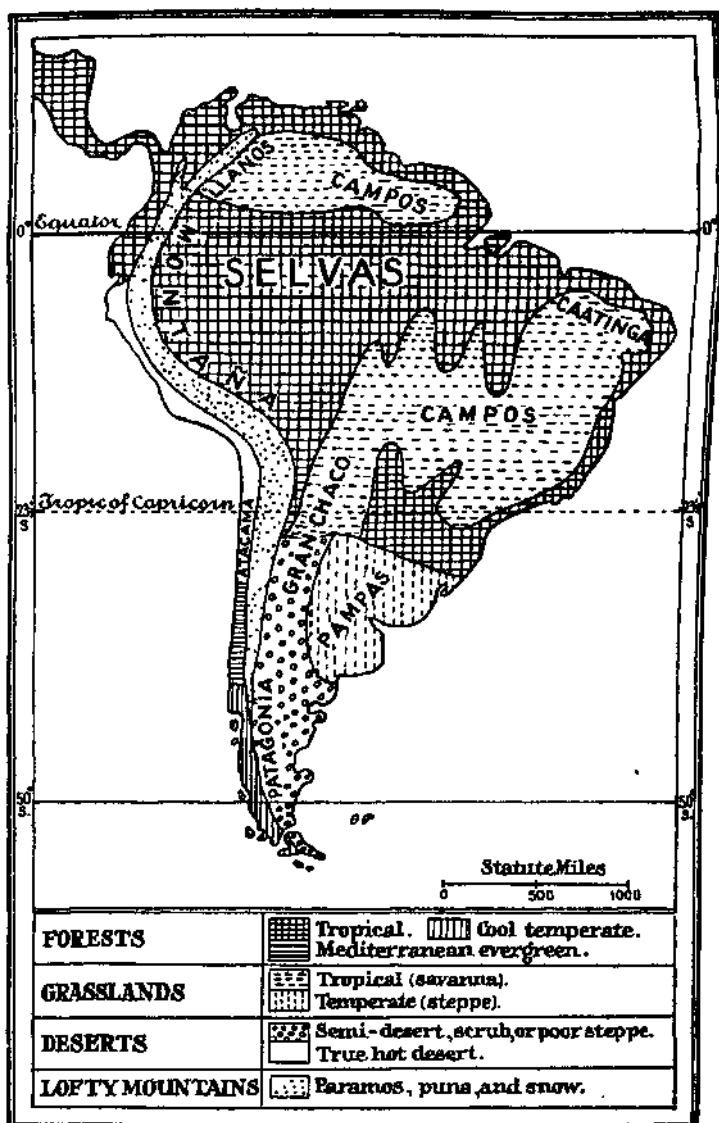


FIG 13 THE NATURAL VEGETATION OF SOUTH AMERICA

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conditions for the growth of gigantic trees. Here there grow the greatest forests of the world—the selvas. Many varieties of palms, and trees producing rubber, cabinet woods, cacao, and other useful commodities, grow in dense formation, entwined with clinging lianas and a profusion of other climbing plants, all fighting for the light and air above the thick foliage of the forest giants. The undergrowth is an almost impenetrable tangle of creepers, lianas, and other plants rising from the muddy soil. Large animals are rare, and monkeys, insects, and brightly plumaged birds are the chief inhabitants of the forests. Forests of similar type extend along the coastal lowlands from the Gulf of Guayaquil northward, and continuously along the Atlantic coasts to a little way beyond the Tropic of Capricorn. In the upper sections of the Parand and Paraguay basins there are luxuriant forests of a subtropical type, in which the trees are neither so large nor so densely packed together as in the selvas.

2. *The Cool Temperate Forests.* Southern Chile, lying in the belt of constant westerlies and backed by the steeply rising Andes, is another region of heavy rainfall; only the cooler temperature conditions distinguish it from the equatorial lowlands. Southern Chile has splendid forests of evergreen and deciduous¹ trees, beeches, laurels, pines, and cedars reaching up the western slopes of the Andes to about 5000 feet. The number of species is relatively small and the undergrowth scanty—a marked contrast with the selvas.

3. *The Mediterranean Region.* Central Chile lies in a similar position to the Mediterranean countries of Southern Europe and Northern Africa, on the western side of the continent, in such latitudes as to receive the wet westerly winds during the winter portion of the year only, the summer being dry. Most of the timber from the scattered forests of beeches, laurels, and cypresses has been cut down, and evergreen bushes like the mimosa are the chief plants

¹ Deciduous trees are those that shed their leaves in autumn.

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of any size. Toward the south, and also on the lower mountain slopes, where rainfall is more abundant, there are forests of larger trees resembling those of Southern Chile. In many ways Central Chile is comparable to the valley of California in the United States, which lies in a corresponding position in the Northern Hemisphere.

THE GRASSLANDS

If the rain falling during the year is too small in quantity to saturate the subsoil, but enough to keep the surface moist in the active growing season, the chief natural vegetation is grasses, with trees or bushes in the wetter parts—for example, along the river-banks.

i. *The Savannas or Tropical Grasslands.* On either side of the equator, in the Orinoco lowlands and Guiana highlands on the north and the Brazilian highlands on the south, most of the rain comes during the summer months, while the rest of the year has a much smaller quantity and is liable to droughts. The llanos* of the Orinoco lowlands and the campos² of the Guiana and Brazilian highlands are regions of tall grasses growing in tufts, with bushes and trees occurring wherever there is sufficient water. Plants with bulbous or tuberous roots capable of storing water are common—lilies, for example—and many of the trees are stunted, and have small, thick leaves which do not transpire (breathe out) moisture too readily.

The Gran Chaco or Great Hunting-ground, a broad strip of country lying between the Paraguay river and the Andes, is in some respects not unlike the Brazilian campos. The greater part of the year is very dry, but in summer the rainfall is so heavy that the rivers flood extensive areas. The vegetation varies a great deal, but in general consists of open woodlands, with occasional stretches of grassland.

¹ *Llano* (Spanish) = 'grassy plain.*'

² *Campo* (Spanish) — 'open country.'

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2. *The Steppes¹ or Temperate Grasslands.* From the coasts of the Plata estuary to about half-way across the continent there is a great stretch of level or gently undulating land where light rains are received at irregular intervals throughout the year. This is the region of the pampas,² covered with an almost unbroken sea of grasses, among which the fleecy white plumes of the pampas-grass, flourishing on the moist, clayey soils, often rise to a height of eight or nine feet. Toward the west the rainfall diminishes, and there are coarse grasses and drought-resisting plants of the cactus type.

Southern Patagonia, the wind-swept Falkland Islands, and the eastern half of Tierra del Fuego are regions of poor, coarse grasses, in general appearance not unlike the grassy moorlands of the Pennines and Scotland.

THE DESERTS

In South America the desert regions are found on the leeward side of the Andes, where the rainfall is too low to support even grasses.

i. *The West Coastal Desert.* In Southern Peru and Northern Chile there are desert conditions over all land below about 10,000 feet. This belt, lying between the coast range and the towering Andes, is one of the most arid in the world. In Peru the Andean streams form ribbon-like oases, like so many Nile valleys on a smaller scale. Northern Chile is absolutely bare desert almost as far south as 30° S.

2. *Western Argentina.* As the rainfall diminishes with increasing distance from the Atlantic the grasses of the pampas give place in the western half of Argentina to a dry region of small, thorny bushes and prickly cacti. Here again the rivers provide narrow oases.

3. *Patagonia.* Patagonia is swept by strong westerly

¹ *Steppe* is the Russian name for treeless grasslands.

² *Pampa* (Spanish) = 'plain,' or 'prairie,' a treeless grassland.

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winds that have lost their moisture on the western slopes of the Andes. The scanty and irregular rainfall and strong winds will only permit scrubby, low-growing bushes, and a good deal of the land is a broken plain of shingle, gravel, and sand.

THE ANDEAN BELT

Stretching through 65 degrees of latitude, and rising in some parts to more than four miles above sea-level, the Andes furnish example of practically every type of vegetation. North of the equator, wherever the rainfall is abundant, both sides of the mountain barrier are forested, the character of the forests changing from the evergreen equatorial type on the lower slopes to a temperate deciduous kind above 6000 or 7000 feet. Small, hardy trees and shrubs extend upward another 4000 feet, and beyond that lie poor pastures, with a few hardy pines, and finally, crowning all, come the eternal snows. The same succession of vegetation belts occurs south of the equator on the eastern slopes rising up from the Amazon selvas. The name *montafia* has been given to the vast crescent of forests lying on these eastern slopes within the tropics.

The enclosed plateaux of Ecuador, Peru, and Bolivia have rather scanty rainfall, and depend in the main upon streams from the lofty Cordilleras for their water-supply. Various kinds of grasses form the chief natural vegetation. The bleak, grassy mountain slopes up to about 14,000 feet are known as *paramos*, while the highest plateau regions, subject to sudden extreme changes of temperature and swept by dry, icy winds and supporting very little plant life, are called *punas*.

In dealing with the geography of the various countries of South America we shall divide each one into natural regions. A natural region is one in which the natural conditions—relief, climate, vegetation—are similar throughout the whole area, thus separating it more or less clearly from surrounding natural regions where the geographical

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conditions are different. A map showing the natural regions will bear a close resemblance to a map of the natural vegetation. The character of the natural region determines in very great measure the lines upon which man can develop, and generally we find much similarity in the occupations, products, and civilization in natural regions of the same type in different parts of the world.

Man-made boundaries do not always follow those of nature. One natural region may be divided among two or more nations. But in South America we shall regard the political divisions as the more important, and describe the natural regions contained within the boundaries of each country.

EXERCISES

1. Explain briefly the meaning of selvas, llanos, campos, pampas, montana, paramos, punas.
2. Compare the distribution of natural vegetation in South America and Africa.
3. Point out the contrasts in natural vegetation in corresponding latitudes on the west and east coasts of South America south of the equator.

CHAPTER V

THE THREE GUIANAS

WE have already seen that almost the whole of South America fell under the domination of Spain and Portugal within a short period after its discovery. It was not until the early seventeenth century that other European Powers gained a footing there. The Guiana colonies have had a chequered history, changing hands several times, but their ownership was finally determined by the Treaty of Paris in 1814.

The three Guianas consist of the eastern section of the Guiana highlands, sinking gradually to a broad coastal plain. It is convenient to remember that these colonies lie in diminishing order of size and development, and with the initial letters of their names in alphabetical order, from west to east: British, Dutch, French.

BRITISH GUIANA

British Guiana, the only British possession on the mainland of South America, appears very small by comparison with the other countries of this continent, but, with an area of 90,000 square miles, it is actually a little larger than Great Britain. Its population, however, is only a little over 300,000—less than that of Bristol.

This Crown colony may be divided into two natural regions: the coastal plain and the southern highlands.

The coastal plain, 10 to 30 miles wide, is the more important section of the colony, and consists of exceptionally fertile alluvial soils. Some of the land near the coast is below sea-level, and was reclaimed by early Dutch settlers,

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who built dykes and drained the enclosed polders¹ by means of canals just as they were accustomed to do in their own homeland.

The climate is always hot, and there are two wet seasons, June to August and December to February. The north-



FIG 14. THE THREE GUIANAS

east trades, blowing from the Atlantic, exercise a cooling influence, but even so the climate is trying for Europeans. It is not surprising to find, therefore, that the bulk of the population consists of natives of British India (over 40 per cent.) and negroes (about 40 per cent.), the latter being descended from the old African slaves. The negroes are

¹ *Polder* is the name the Dutch give to a piece of land reclaimed from the sea by embanking and draining.

THE THREE GUIANAS

unsatisfactory workers, but the British Indians are so industrious that a scheme is now being prepared with the object of encouraging still greater immigration from India. The Europeans number about 17,000, and are mainly British, Portuguese, and Dutch—chiefly plantation-owners.

The coastal plain is excellently suited to the cultivation of tropical crops, although at present only a belt about 5 miles wide is used, the remainder being densely forested. Of these crops sugar-cane is easily the most important. Sugar is grown very widely throughout the wet tropical lowlands of South America, but British Guiana is one of the few parts with a surplus for export. Sugar, together with the allied products of molasses¹ and rum, constitutes in value more than half the exports of the colony, and over half the population is dependent on it. Canada is the chief market for the sugar.

Rice also thrives in the coastal belt; in some parts two crops a year are secured. Although methods of cultivation are primitive, the export (mainly to the West Indies) has increased greatly during recent years, and the colony has become the chief rice-growing country of South America.

Coconut-palm plantations provide exports of copra (the dried coconut kernels) and coconut oil, besides the nuts themselves.

The timber resources are great, and since the setting up of a highly efficient Forestry Department in 1925 the export of tropical hardwoods has increased. British Guiana is the only recognized source of greenheart, a remarkably heavy and durable timber, used in lock-gates, piers, and other structures exposed to water or tropical insects and—of infinitely less importance—for fishing-rods and billiard-cue butts!

Other products of minor importance are coffee, rubber, cacao,² and fruits.

¹ Molasses is the syrup or treacle that drains from sugar during the process of manufacture.

² The word 'cocoa' is really a misspelling of the word 'cacao.'

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The southern highlands have a much more healthy climate than the coastal plain. Besides the extensive forests of the lower parts, there are stretches of savanna on the higher plateau areas, where a few cattle are reared. Most of the region is still untouched and practically unknown, since penetration is easy only along the rivers.

Diamonds and gold are important exports, both-obtained from alluvial deposits, chiefly by hand-washing.

For over sixty years balata gum, somewhat like rubber, has been collected by tapping trees found in the interior forests. The work is done mainly by negroes, who may have to face a journey up the rivers of anything between a fortnight and six weeks before they reach the section of forest in which they are to work. The Government insists upon every care being taken to prevent exhaustion of the balata supply by careless bleeding or by destruction of the trees. The coagulated balata is exported for use in making cables, golf-balls, and (combined with canvas) machinery-beltting.

Rich deposits of bauxite, or aluminium ore, are being worked in the valley of the Demerara river, and exportation is increasing, mainly to Canada.

Georgetown (57,000), built on very low ground at the mouth of the Demerara river, is the capital and chief port of the colony. It is conveniently placed for the traffic of the Essequibo river also, while a railway connects it with the mouth of the Berbice river, some 60 miles away, where New Amsterdam (8000), a smaller port, lies on the opposite bank. Georgetown is finely laid out and well built; it has electric lighting and tramways, splendid Botanic Gardens, and possibly the finest cricket-ground in the tropics.

In the future development of British Guiana certain great difficulties have to be faced. Apart from the shortage of labour, which will probably be met by a greater influx of Indian coolies, transport problems are the most urgent. There are only three railways, all of single track, and totalling less than 100 miles in all. The chief means

THE THREE GUIANAS

wet and oppressive, and diseases like malaria and dysentery are prevalent—conditions unlikely to attract many settlers.

The colony is very backward indeed; only small quantities of agricultural produce (sugar, coffee, cacao) are exported; indeed, the only important export is gold.

There are no railways and very few roads. Cayenne (14,000), the capital and chief port, stands on an island at the mouth of the river Cayenne. Large vessels cannot approach the town, but must discharge into lighters.¹ Devil's Island, the site of the celebrated French convict settlement, lies 27 miles away, in shark-infested waters.

¹ Open boats used in loading and unloading large vessels.

EXERCISE

Draw a large map of the three Guianas, and on it record, preferably by symbols, as much information as possible from this chapter. Your map will be a 'shorthand' account of this region.

CHAPTER VI

THE NORTHERN ANDEAN STATES: VENEZUELA (WITH TRINIDAD), COLOMBIA, PANAMA

THE Northern Andean states of Venezuela, Colombia, Ecuador, Peru, and Bolivia have much in common. All except the last may be divided into three natural regions,

i. A *coastal plain*, with hot, wet climate, except in Peru, where arid conditions prevail. Tropical products like

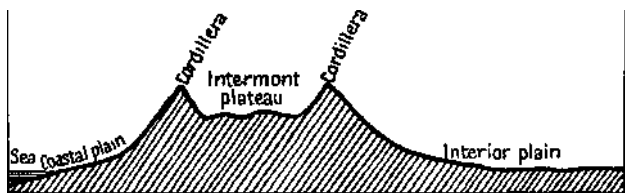


FIG. 16. ROUGH SECTION ACROSS AN ANDEAN STATE

Height scale greatly exaggerated

sugar-cane and cacao are cultivated. The only towns of importance are ports. Bolivia originally had a coastal plain, but she lost it to Chile as a result of the Pacific War of 1879-84.

2. A *mountain and plateau belt*, where climate and natural vegetation vary according to height. The bulk of the populations of these states live upon the plateaux, where the climate is much more healthy than in the adjoining lowlands, and where the grasslands are capable of easy development and settlement. Grain and potatoes are grown, sheep and llamas are reared, while mining for gold, silver, and other minerals has always been important.

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On the lower slopes up to about 6000 feet coffee is an important crop. The capital cities have naturally been built upon the productive plateaux, although Cuzco, the ancient Inca capital, has been replaced by the Spanish Lima, in the coastal belt of Peru.

3. An *interior plain*, with hot and generally wet climate, covered with equatorial forests or savannas. Being difficult of access, these plains are thinly peopled and little developed.

Obviously communications between coastal plain and interior lowlands are exceptionally difficult, if not almost impossible. Yet the well-peopled plateau which separated them always tended to link them to itself and thus form a united country from the three separate regions.

VENEZUELA, WITH TRINIDAD

In 1499 Spanish navigators sailing along the northern shores of South America discovered and entered the huge Gulf of Maracaibo, to which they gave the name Gulf of Venice. Around the shores of Lake Maracaibo, a fresh-water lagoon larger than Wales, they found native villages built on piles. The resemblance to Venice, the great Mediterranean port, at once suggested the name Venezuela ('Little Venice'), a name now applied to a land more than three times the size of the British Isles and with a population of over three millions. The European inhabitants are mainly descendants of Spaniards from Catalonia and the Basque provinces.

The republic of the United States of Venezuela was the first of the old Spanish colonies to devote itself to the task of breaking away from the mother country, a task accomplished in 1821, after fourteen years of bitter struggles. Simon Bolivar, a most brilliant and cultured soldier and statesman, played the most prominent part in liberating not only Venezuela, but also Colombia, Ecuador, Peru, and Bolivia. The history of Venezuela during the nineteenth

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century was one of turmoil and revolution. Steady development was impossible, and relations with Great Britain, Germany, and the United States were frequently troubled and unprofitable. The country was finally united under a strong central government by the victory of General Gomez at Ciudad Bolivar in 1903, and in recent years Venezuela has made remarkable progress in commercial and industrial prosperity. Poor communications still constitute a serious handicap, but improvements will be effected. Indeed, important road developments have already been undertaken, and many bridges are being built. The peoples of Europe and North America are more inclined to invest capital and take part in the development of a country of great potential wealth now that political stability has been secured. The amount of British capital invested in Venezuela rose from £9,000,000 in 1924 to over £26,000,000 in 1928. The capital invested in the 650 miles of railways is mainly British and German.

In addition to the three natural regions referred to at the beginning of this chapter, Venezuela has a fourth: the western section of the Guiana plateau, where the valleys and lower slopes are densely forested and the high plains form open campos. This region is still undeveloped, although balatd gum, rubber, cabinet woods, and gold are exported. These products are naturally sent to Ciudad Bolivar, on the Orinoco, toward which flow several long tributaries.

1. *The Coastal Plain.* In Western Venezuela the Cordillera branch into two main arms, enclosing between them extensive plains bordering Lake Maracaibo. The eastern chain, the lofty Sierra de Merida, turns eastward and runs close to the coast, so that the coastal plain is very narrow indeed. The temperature in these lowlands is uniformly high, but the rainfall is by no means heavy, except on the higher slopes behind. Tropical agriculture is in a flourishing state, the chief product being cacao of high quality, exported mainly to the United States. Sugar is exported, but the bulk of the crop is for home consumption, as is also

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the tobacco. Negroes are the chief workers on the plantations.

The most striking development of recent years has been the exploitation by United States and British companies of the extensive oilfields surrounding Lake Maracaibo. So rapidly has the output of petroleum¹ increased that in

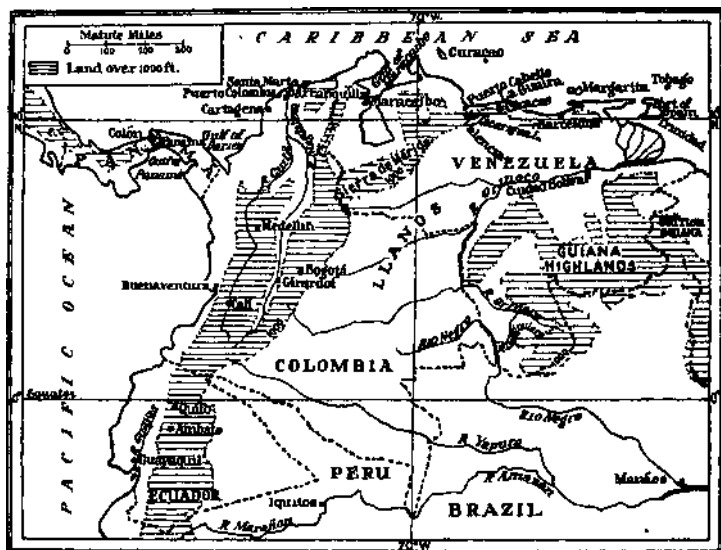


FIG. 17. VENEZUELA, COLOMBIA, ECUADOR, TRINIDAD, AND CURACAO

The railways of these countries are shown in Fig. 62, p. 303.

1929 Venezuela ranked next to the United States as the second largest oil-producing country in the world. Pipelines convey the oil to the coast, whence it is taken to Curaçao Island (Dutch) for loading on to ocean-going oil-tankers. Deep-water stations have just been opened, however, on and near the entrance to the Gulf of Maracaibo, so that ocean-vessels may now be loaded direct. Asphalt,

¹ Literally 'rock-oil.'

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another product of the oilfields, is exported by an American company.

La Guaira (10,000), the chief port of Venezuela, is built on a narrow strip of coast backed by the ridge which separates it from the capital, Caracas. The harbour, formerly an open roadstead, has been vastly improved by a breakwater, constructed by a British company.

Maracaibo, on the western shore of the entrance to Lake Maracaibo, is the chief coffee port of Venezuela. It has grown very rapidly in recent years as the chief petroleum centre, and is a wealthy city of over 75,000 people. Maracaibo is essentially modern in outlook, probably owing to the large foreign population. An air-service twice weekly connects it with the oilfields on the opposite shore of the lake.

Puerto Cabello lies over 60 miles west of La Guaira, and has about the same population. From its fine, well-equipped harbour there pass out products like coffee, copra, timber, cacao, and hides.

Margarita ('Pearl') Island is the largest of the many Venezuelan islands, and has important pearl-fisheries.

Three of the small islands lying between Margarita and the Gulf of Maracaibo belong to Holland. The largest and most important is the hilly island of Curasao (almost as big as the Isle of Man), 40 miles off the Venezuelan coast. Curasao, once the headquarters of smugglers, produces salt, sugar, tobacco, and oranges of a special kind used in flavouring the famous Curasao liqueur. Willemstad (20,000), the capital of all the Dutch West Indies, has a fine harbour. It has increased in importance owing to the development of the Venezuelan oilfields, and supplies ocean-going vessels with fuel-oil and coal, besides being a port for the transhipment of passengers and cargo to and from Maracaibo.

Of much greater importance than Curasao is the British Crown colony of Trinidad, standing upon the continental shelf and continuing in the north and south the coastal

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mountains of Venezuela. Trinidad 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 coco-



FIG. 18. A COCOA ESTATE IN TRINIDAD

By courtesy of Messrs Cadbury Bros., Ltd.

nuts, coffee, bananas, oranges, tobacco, and rubber. The chief cultivated products—sugar and cacao—form 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 caulking¹ 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

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

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full. Trinidad has also an important oilfield, with wells and refineries. In 1928 over 222,000,000 gallons of petroleum were exported.

Of the population (about 397,000) the majority are of African negro descent; most of the remainder are coloured



FIG. 19. REAPING COCOA-PODS IN TRINIDAD

Of what race **are** the workers? Notice how the baskets of pods are carried.

By courtesy of Messrs Cadbury Bros , Ltd

peoples, and the few whites are British, French, Spanish, and Portuguese.

Port of Spain (67,000), 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 20 miles north-east of Trinidad, with which it is governed, exports tobacco, cacao, coconuts, and sugar.

2. *The Andean Belt.* The loftiest part of the Venezuelan Andes is the Sierra de Merida, rising to over 15,000 feet,

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Venezuela are hides and skins—not flesh. Undoubtedly the llanos will have a great future in both stock-raising and tropical agriculture.

Ciudad Bolivar (*i.e.*, 'Bolivar City'), with 17,000 inhabitants, is the only town of any size in the llanos. It stands on the right or south bank of the Orinoco, 240 miles from the sea, at a point where the river narrows, thus increasing the flood depth. It is accessible to sea-going vessels, while smaller craft can penetrate in the rainy season right into Colombia. Bolivar is the great market centre for the whole of the Orinoco river-system, the sole means of transport available at present, except for numerous rough animal trails.

Owing to a gap in the coast range, the llanos reach the Caribbean Sea in the neighbourhood of Barcelona (16,000), which, with its port of Guanta, eleven miles away by rail, is likely to grow into a great city. The district has coal- and salt-mines, and furnishes an outlet for cattle, cotton, sugar, and cacao.

COLOMBIA

Colombia, lying in the extreme north-west of South America, is even larger than Venezuela, with an area equivalent to that of France and Germany combined, so that it is the fourth largest state of its continent. New Granada, as the Spaniards first called this land, has along its northern shores the famous ports of the Spanish Main, whence Spanish galleons set sail for Europe laden with treasure. During the sixteenth and seventeenth centuries pirates and buccaneers preyed upon the fleets of galleons and frequently attacked the ports. Cartagena was sacked in 1586 by Sir Francis Drake. The independence of New Granada was secured in 1819 by the inspired genius of Simon Bolivar, who utterly defeated forces sent over to assert Spanish authority. Bolivar became first President of the republic, to which he gained for a few years the allegiance of Venezuela and Ecuador, thus forming Greater

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Colombia. Sfm6n Bolivar's death in 1830 was quickly followed by the breaking up of the alliance into three separate countries. The name Colombia was first adopted instead of New Granada in 1871.

Although Spain misgoverned her colony, Colombia owes a great debt to the early Spaniards, who brought an advanced civilization, built fine cities, introduced horses and mules for transport purposes, and compelled the natives to make hundreds of miles of paved roads, some of which are still used.

The population of Colombia is estimated at 8,000,000. Native Indians of pure stock form about 7 per cent., negroes, who live a lazy life on the hot, wet coastal lowlands, about 5 per cent., the remainder of the people being classed as whites, although the greater number are of mixed blood. The population is concentrated chiefly on the more healthy, higher regions of the Cordilleran plateaux and the Santa Mar ta region.

Until quite recently Colombia remained a very backward country, owing to the usual causes: transport difficulties, revolutions, and shortage of capital and labour. It is the only state of South America with a coastline on both Atlantic and Pacific, but these coasts were only recently brought into close contact by the opening of the Panamd Canal.

The difficulties of transport still persist, but progress is being made. The relief of the country makes it clear that inland waterways form the chief means of transport, and that in a north and south direction only. Movements to east and west are extraordinarily difficult. There are regular steamboat services from Cartagena and BarranquiUa up the Magdalena and its tributary the Cauca. The Magdalena (over 1000 miles long) is the great highway of Colombia. Navigation is interrupted by rapids 600 miles from the sea, but a railway (70 miles) provides a link to another stretch navigated by smaller steamboats, which in **turn link up** with a railway to Bogotd, the capital. Since

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1921 water-plane services for passengers and mails have been organized from Barranquilla along the Magdalena valley to Girardot, the port of Bogotd, and to Buenaventura, the Pacific port, *via* Cartagena. Although these aircraft journeys are costly, they accomplish in eight hours the journey to Girardot, which by river takes about ten days.

Railways are chiefly minor links for the system of river transport, but new lines are being constructed that will link Bogota with both Atlantic and Pacific ports. There are practically no good roads, except near Bogota, but a few motor-highways are being constructed. A good deal of transport is carried on by pack-mules and horses, and there are three overhead ropeways, one (owned by a British company) being the longest in the world.

In trade Colombia is greatly dependent upon the United States, which take 80 per cent, of the exports and supply 50 per cent, of the imports. Great Britain comes next, taking 5 per cent, of the exports and providing over 21 per cent, of the imports (mainly in the form of textiles).

Colombia can conveniently be divided into the three regions of coastal plains, Andean belt, and interior plains.

1. *The Coastal Plains.* The coastal plains and the lowlands of the valleys of the Magdalena and other rivers flowing to the Caribbean Sea are oppressively hot and very wet, especially on the Pacific coast, where rain falls every day. These lowlands are naturally forested, but on the Caribbean side there are extensive plantations of tropical crops.

In the Santa Marta district huge numbers of bananas are cultivated chiefly by irrigation, about half of the estates being owned by the United Fruit Company of the United States. The fruit is exported to Europe and the United States; in recent years about one-third of the bananas coming into the British Isles have been grown in Colombia,

Tobacco of good quality is grown; some is manufactured into cigars and cigarettes, and the surplus **exported mainly**

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to France, the United States, and Germany. Sugar is widely grown, but does little more than supply the home market. Many regions are suited to the cultivation of cotton, but at present the Colombian mills find it necessary to import large additional supplies from the United States.

The tagua, or vegetable ivory-nut, used for making buttons and collar-studs, is an important product of the ivory-nut palm, which flourishes over most of the wet tropical lowlands. Rubber and chicle (the product of the zapote-tree, exported to the United States for making chewing gum) are fairly important, but cacao has declined.

Much of Colombia's wealth lies in her cattle industry. The chief region is the one best situated for export trade—the Caribbean plains, where there are 3,000,000 cattle of the 10,000,000 in the whole country, giving rise to the exportation of live cattle and hides and, in a small way at present, of meat. Improved breeds have been introduced.

Petroleum is produced from a valuable oilfield in the Middle Magdalena valley, about 400 miles from the mouth, the oil being sent by pipe-line to Cartagena (350 miles). The output has increased, so that petroleum is now second to coffee as a source of national wealth.

There are enormous reserves of timber, but mahogany is the only wood of any importance in trade to-day.

Barranquilla, a busy city of 140,000 people, stands on the western branch of the Magdalena delta, 17 miles by rail from its outport, Puerto Colombia, on the Caribbean Sea. Barranquilla is the chief Colombian port, handling one-half of the total foreign trade, coffee export being noteworthy.

Cartagena (87,000), approached by a narrow, winding channel flanked by ancient forts, has much to remind one of old Spain and the exciting times of the Spanish Main. A railway to Calamar, on the Magdalena, enables Cartagena to share in the traffic of that great river-valley.

Santa Marta is developing as a port in connexion with the banana trade.

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On the Pacific coast, so long isolated from the Caribbean Sea, there is only one large port, Buenaventura, which ranks third after Barranquilla and Cartagena. Although on an unhealthy coast, Buenaventura is rapidly developing owing to two factors: its nearness to the well-peopled, highly productive Upper Cauca valley, to which it is joined by railway, and the opening of the Panam⁴ Canal. It exports coffee, gold, and platinum. One day it will be the terminus of a railway from Cartagena.

2. *The Andean Belt.* The high valleys and plateaux of the Cordillera are more suited to Europeans than are the hot, wet lowlands, and support the majority of the population of Colombia. Transport difficulties have long compelled these relatively densely peopled areas to depend entirely upon local supplies, and the production of temperate crops like wheat, barley, maize, and potatoes and the rearing of cattle, goats, and (on high pastures) sheep constitute important industries.

From the point of view of foreign trade coffee is easily the most important product of Colombia, the bushes growing on plantations at 3000 to 7000 feet above sea-level. While the output is far surpassed by that of Brazil, Colombian coffee has a fine reputation for quality, and commands the highest prices. The bulk of the export goes to the United States; Germany is the chief European customer.

Minerals are naturally important in the mountain belt. Colombia is the world's chief source of emeralds, exported for over 400 years. The production of gold and silver has declined in modern times, but the platinum obtained from various rivers in the south of the Colombian Cordillera has become the chief source of the metal owing to the decline in Russian production.

Bogotd, the capital of Colombia, stands on a plateau over 8500 feet above sea-level, with high mountains enclosing it. The climate of the plateau is perpetually spring-like, the average temperature every month being about 58° F.—like the June of Southern England. The rainfall

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is fairly heavy, coming especially at two periods of the year, as is generally the case so near the equator. Founded in 1538, Bogota has grown into a large city of 235,000 people, the commercial and intellectual centre of the well-developed, densely peopled plateau. In the past the plateau has developed as an independent region, but with improving communications it is getting into closer contact with the outside world.

Medellin (121,000), the second city of Colombia, lies at a height of over 5000 feet, and is reached by railway from the Magdalena. It is the chief centre of the mining and coffee industries, and has many factories producing textiles (both cotton and woollen), cigarettes and cigars, and other goods. It is in every way a modern progressive city, with electric light and power, and facilities for all popular games—football, cricket, golf, etc.

Cali (125,000), in the Upper Cauca valley, is a similar commercial centre. Railways join it to the Pacific port of Buenaventura and also to the other populated areas of the Cauca valley.

3. *The Interior Plains.* More than half of Colombia consists of the eastern lowlands, a region drained by long rivers flowing to the Orinoco in the north and the Amazon in the south. The climate is always very hot, while the rainfall increases in quantity passing south. Thus the northern section, with a well-marked dry season, forms part of the savannas known as llanos, with forests along the river-courses. The section of Amazon lowlands in the south is, of course, densely forested.

The whole region is very little developed, and is inhabited by tribes of native Indians. Transport difficulties are obviously great, owing to the Cordillera on the west and the distance from the sea on the east; there are no railways and no roads leading to the Atlantic, but only rivers liable to alternations of floods and droughts.

The fine pastures of the llanos support large numbers of cattle and horses—the descendants of those introduced by

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the Spaniards—and the region could support many millions of animals. Improved breeds, attention to diseases, and, above all, better transport facilities are the conditions essential to future development.

The selvas of Southern Colombia possess an almost untouched store of wealth in the form of tropical hardwoods, rubber, and other forest products.

PANAMA

The small republic of Panamd 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, Panamd 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 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 £50,000 a year to Panamd. Not until 1924 did Colombia recognize her old province as an independent nation..

The isthmus has two longitudinal mountain ranges,

¹ The Spanish name for Columbus.

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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 trades¹ 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 442,522 (1923 census) is not much greater than that of Dublin. There were 52,000 whites, over 300,000 mestizos² and Indians, and 86,000 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 others are being established on the Pacific side. Bananas account for three-fifths 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, and pearls are other sources of wealth.

Panama City (60,000), the capital of the republic, on the Pacific coast, and Colon (32,000), at the Atlantic end of the PanamcL Canal, are both excluded from the Canal Zone, and are not under the control of the United States. Intoxicants may be sold and consumed openly, and to many people the cabarets and night-life of these cities constitute their chief attractions.

The future of the republic is closely bound up wuh the great canal, one of the most important trade links in the world. Columbus and other voyagers had sought a sea-

¹ 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.

² Mestizos are people of mixed blood (Spanish and American Indian).

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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 Panama 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 Panamd. In 1889 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, 5 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 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, yellow fever, and plague, which caused 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 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

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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

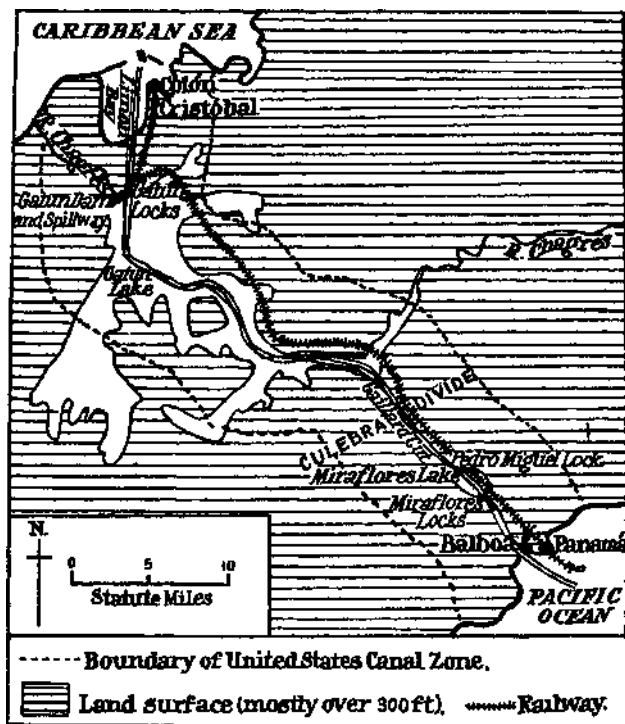


FIG. 21. THE PANAMA CANAL

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

considerably more healthy than most parts of the United States.

The French were attempting to construct a sea-level 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

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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

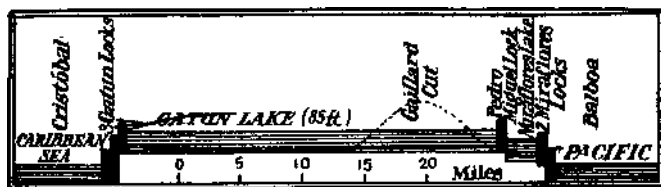


FIG. 22. SECTION ALONG THE PANAMA CANAL

The vertical scale is exaggerated over a hundred times.

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 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 34 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, 9 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 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

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finally another 55 feet in the two Miraflores Locks to the Pacific Ocean level. Each lock-chamber is 1000 feet long, no feet wide, and 70 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 Panamd City, is the Pacific port. Both terminal ports have extensive harbour works, with piers, wharves, and coal and oil depots.

The Panama Canal was officially opened on August 14, 1914, and since the Great War has been open on equal terms to the ships of all nations. In 1929 over 6400 vessels passed through the canal, the annual cargo tonnage being 30,000,000. The tolls more than cover the cost of upkeep.

The severing of the Panama Isthmus may ultimately prove as great an event in the history of world trade and development as the opening of the Suez Canal. The Panamd Canal has already had results of far-reaching importance. Naturally the United States have benefited most of all. Their naval strength has been increased by the possibility of quickly concentrating all vessels on either Atlantic or Pacific coast. New York is 5262 nautical miles from San Francisco *via* the Panami Canal, as compared with 13,135 *via* Magellan's Strait. There is now cheap water-transport between the Atlantic and Pacific seabords of the United States, and the Pacific ports are about half their former distance from Europe. Immense savings are effected upon voyages from North American Atlantic ports to Australia, New Zealand, China, and Japan, so that the United States are likely to develop their Far Eastern and Pacific trade at the expense of their European rivals. The Pacific ports of South America have been brought into close contact with the great markets of Eastern

¹ Spanish for Christopher.

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¹ Spanish for Christopher.

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North America and Western Europe. The canal is certain to have a marked influence upon the development of all the Pacific lands of the Americas. The West Indies will benefit, too, by lying upon a great trade highway instead of in a backwater.

Great Britain has, of course, also benefited by closer contact with the Pacific coasts, but the Panama Canal has in no vital sense affected her Suez Canal traffic. The Suez Canal still provides the shorter route from Europe to India, the Far East, and Australia. Wellington, New Zealand, is 11,425 miles *via* Panama and 12,989 *via* Suez—distances so little different as to make the routes simply alternative.

EXERCISES

1. At the top of a page copy the rough section of an Andean state (Fig. 16). Divide the rest of the page into three columns, headed "Coastal Plain," "Mountain and Plateau Belt," and "Interior Plain." Under each column give a brief summary of the geography of the region as it occurs in Venezuela

2. Repeat Exercise 1 for Colombia

3. Draw simple sketch-maps to show the position and importance of (a) Caracas, (b) Bogota, (c) Barranquilla.

4. In 1929, 3065 vessels, with cargo tonnage of 20,780,486, passed through the Panama Canal from Pacific to Atlantic, while 3348 vessels, with cargo tonnage of 9,882,520, passed from Atlantic to Pacific. Can you suggest any reason for this big tonnage difference? What kind of goods would be carried?

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

CHAPTER VII

THE NORTHERN ANDEAN STATES: ECUADOR, PERU, BOLIVIA

ECUADOR

ECUADOR ('Equator'), the smallest of the Andean republics, lies mainly south of the equator, bordered on the north by Colombia, on the south by Peru. The exact boundary between Peru and Ecuador is not fixed, but Ecuador may be regarded as the same size as the British Isles, although it claims a much larger area.

The history of Ecuador is one long story of change, war, and rebellion since it ceased to be part of the Inca Empire; but it has remained an independent republic since 1831.

The population is estimated at nearly 1,600,000, the majority living upon the high plateaux, and about 400,000 in the coastal belt. The people are almost wholly native Indians, descendants of the Quichas, a race of fine physique, or mestizos of mixed Indian and Spanish blood. The few people, of pure Spanish descent are chiefly responsible for the government and progressive development of a country that is still little developed commercially.

1. *The Coastal Plain.* The coastal plain, 80 miles wide, is broken up by many spurs from the Andes, and by a coastal range north of the Gulf of Guayaquil. Only one of its rivers—the Guayas—is at all important for navigation, giving a route northward for steamboats.

The temperature is constantly high (about 80° F.); there is a rainy season in the early part of the year (December to May), the rest of the year being much drier. South of the equator the rainfall diminishes, and beyond the Gulf of

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Guayaquil the land boon becomes desert-like. On the whole the climate is healthy for the tropics. Much of the land north of the gulf is densely forested.

Cacao, the most valuable product of Ecuador, is cultivated east of the Gulf of Guayaquil and in the broad, fertile valley of the Guayas river. Irrigation is necessary in the drier southern parts of the region. Ecuador was once the greatest exporter of cacao in the world, but the industry has declined since the rise of the much more efficiently managed cacao production of the British Gold Coast in West Africa. Attacks of a certain disease have wrought serious damage on the cacao-trees of Ecuador, so that the export trade is declining still further. In 1928 the quantity shipped was only half that of 1922.

Other products are cultivated, such as coffee of fine quality, sugar-cane, cotton, tobacco, and fruits, but none of them is of much importance except for home consumption. Vegetable ivory-nuts form an important export from the forests.

From the toquilla shrub, which grows wild on the wet lands of the coast and the selvas, straw is obtained for the manufacture by hand of 'Panama' hats. The industry is widespread in Ecuador, but the best hats come from the coastal belt. Ecuador has almost a monopoly in the trade, the hats being exported chiefly to the United States and Great Britain.

An Anglo-Ecuadorian company has recently begun to export petroleum from an oilfield near the Gulf of Guayaquil.

Guayaquil (100,000), the chief seaport, is a busy, prosperous, modern town on the Guayas estuary, at the head of the gulf. The harbour is the finest on the Pacific coast of South America. It has saw-mills and other works, and carries on practically the whole of the import and export trade of Ecuador. It is joined to Quito, the capital, by a well-engineered railway, which has to climb with many **loops and** zigzags through magnificent mountain scenery

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to 11,841 feet before descending to Quito, at 9375 feet above sea-level. Trains run three times a week, and although two days are spent in going only 270 miles the

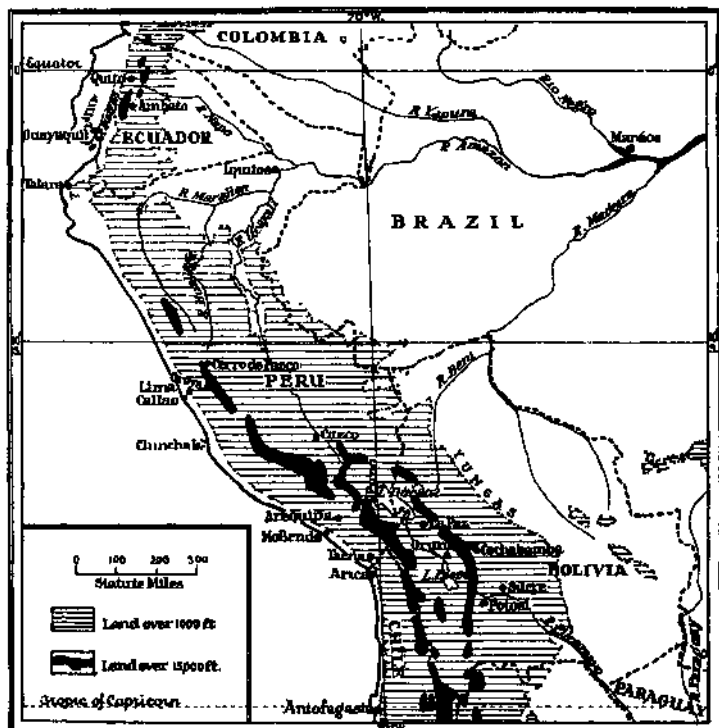


FIG. 24. ECUADOR, PERU, AND BOLIVIA

The railways of these countries are shown in Fig 62, p. 303.

railway has facilitated a journey that formerly occupied a fortnight.

2. *The Andean Belt.* In Ecuador there are two parallel ranges of the Cordillera, both possessing volcanoes like the extinct Chimborazo (20,700 feet) and the active Cotopaxi (19,490 feet), their highest parts snow-clad. Between the

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two ranges there lies a great intermont valley or plateau, 300 miles long and 50 wide, spilt up into separate basins by transverse ridges which unite the main chains. The eastern slopes draining to the Amazon are steeper than those facing the Pacific, and form the montana region.

The plateau is about 9000 feet above sea-level, so that the mean monthly temperature at Quito is regarded as spring-like, the seasonal range being practically *nil*. Daylight and darkness are equal in length throughout the year, but conditions are by no means uniform, for there are considerable variations in the daily weather. Night and early morning are usually clear and cold, frost being frequent, but the direct sun-rays make the temperature rise quickly. In the afternoon clouds gather, and there is frequently a thunderstorm, with heavy rain, hail, or even snow. June, July, and August are rather dry, September to May forming the rainy season. On the whole the plateau region, or puna, is healthy and invigorating, yet rather bleak. There are few trees, but the fertile soil produces crops like potatoes (native to the Andean plateaux), barley, and wheat for home consumption, while cattle, sheep, and horses are reared on large *haciendas* or estates on the high grassy paramos of the mountain slopes.

Some foodstuffs and manufactured goods have to be imported, but cotton cloth is made in mills at Quito, Ambato, and other towns, while hand-weaving is a common occupation in the homes of the plateau people. There are practically no roads, but llamas and mules are employed as pack-animals on the mountain tracks.

Quito (82,000), the capital of Ecuador, is not quite so large as Guayaquil. On an imposing site, surrounded by towering volcanic mountains, it is a picturesque city, largely Spanish in appearance, although traces of the old Inca city still remain. With its fine buildings, including university, cathedral, theatre, and museums, Quito is the centre of government, religion, and culture.

Ambato (10,000) lies 80 miles to the south, at a point

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where a branch line from the Guayaquil-Quito railway runs eastward. Ambato stands on a sandy plateau, where a small river supplies water for the irrigation of orchards of oranges, peaches, grapes, and other fruits.

3. *The Interior Plains*, The montana slopes of the Eastern Cordillera merge into the selvas of the Amazon lowlands. The Napo, down which Orellana made his adventurous voyage, is the chief river flowing to the Amazon. The usual forest products—rubber, hardwoods, etc.—are abundant, but the region is inaccessible and very little developed.

The volcanic Galapagos Islands, lying in the Pacific Ocean over 600 miles west of Ecuador, were annexed in 1885. There are sixteen islands, all bearing English names bestowed by old buccaneers and whalers. Albemarle is the largest, but Chatham Island has the largest population (500 to 600). The climate is cool for such a latitude and the lowlands rather dry, owing to the Peruvian or Humboldt Current, but there is a great wealth of beautiful plants.

The Spanish name Galapago means 'tortoise'¹—given because the islands are the home of large turtles (supplying the tortoiseshell of commerce), formerly much more numerous. Lizard-skins and salt are exported to Guayaquil, while Norwegian companies carry on whaling and fish-canning.

Since these islands lie near the direct route between New Zealand and the Panam⁴ Canal their importance—very small to-day—is likely to increase.

PERU

Peru, the third country of South America in point of size, is the most progressive of the Northern Andean states. The exact population is uncertain, but probably exceeds 5,000,000/ and is rather mixed in character. The majority are the native Indians of the mountain zone;

¹ The latest official estimate of the Peruvian Government is 6,147,000.

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there are also about 300,000 Indians in the eastern or Amazonian region; probably over 1,000,000 are of mixed blood; while there are about 25,000 Chinese and Japanese and 5000 British. The ruling classes of the country, of Spanish descent, are estimated at 500,000. It is they who are mainly responsible for the modern development of Peru.

Peru became the heart of the Spanish Empire in South America, and did not achieve independence until 1824. She received some help in her struggle from the British, who supplied ships, money, and munitions, Lord Cochrane becoming renowned as the leader of a fleet off Callao in 1819. Simon Bolivar became the second President of the new republic in 1827. During the century that followed Peru was frequently involved in wars with her neighbours, revolutions, and boundary disputes. The Pacific or Nitrate War of 1879-84, in which Chile defeated the forces of both Peru and Bolivia, left a legacy of intense bitterness between Peru and Chile, since the latter had annexed the provinces of Tacna and Arica. After prolonged and futile negotiations, in which successive Presidents of the United States endeavoured to give tactful guidance, the fifty-year-old dispute has at last been happily settled, by the Tacna-Arica Treaty of May 1929. Arica Province remains in the possession of Chile, but Tacna is restored to Peru, which will have port facilities provided for her at Arica Harbour, and receive certain sums and properties in compensation.

The United States and Great Britain share between them more than half the import and export trades of Peru, the former having a much greater share in the imports, while the exports from Peru are about equally divided. In 1928 the United States had about £66,000,000 and Great Britain £26,000,000 invested in various enterprises in Peru.

1. *The Coastal Plain.* The narrow coastal plain of Peru, extending 1400 miles between the Pacific, with its low coast ranges, and the Western Cordillera, is very dry and

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sandy. Despite the desert conditions, however, the temperature is rarely very high; the mean annual temperature at Callao is 67° F., as compared with 77° F. at Bahia, in the same latitude on the coast of Brazil. The abnormal coolness of the coast and the very frequent mists and clouds are, of course, due to the Peruvian Current. Such a land cannot support much plant life, but fortunately the High Andes receive abundant rainfall, especially in summer, and this water, increased by melting snows, gives rise to over forty swift rivers, which form ribbon-like oases across the desert belt. About twenty of these oasis-valleys are important for cultivation, each forming a miniature Nile Valley. As in Egypt, crops may be grown only near the rivers, and extension of the irrigable areas is a costly matter. Several important schemes for enlarging the irrigated lands are being carried out. The valleys are isolated from one another, and connexion between them is mainly by the ocean highway. Yet, in spite of the difficulties, progress is being made, especially with certain crops. Agriculture employs the great majority of the people of Peru, the coastal lands being more important than the mountainous areas. Indeed, the coastal plain is the most highly developed part of Peru, owing to its nearness to the Pacific and the fact that the European (mainly Spanish) peoples are settled there. Much of the plantation work is done by negroes and Chinese.

Cotton is easily the most important crop. It is grown in thirty-five coastal valleys. The native varieties are rather coarse, but Egyptian cotton has been introduced, and forms a valuable though minor part of the total export, mainly from the lands south of Lima, where the alluvial soil is remarkably fertile. Further increase in production is hampered by lack of irrigated land, the competition of other crops like sugar, and labour shortage. Over 90 per cent, of the cotton crop is exported.

Sugar ranks next in importance. It is grown in all the coastal valleys, usually on large estates. Peru is unique

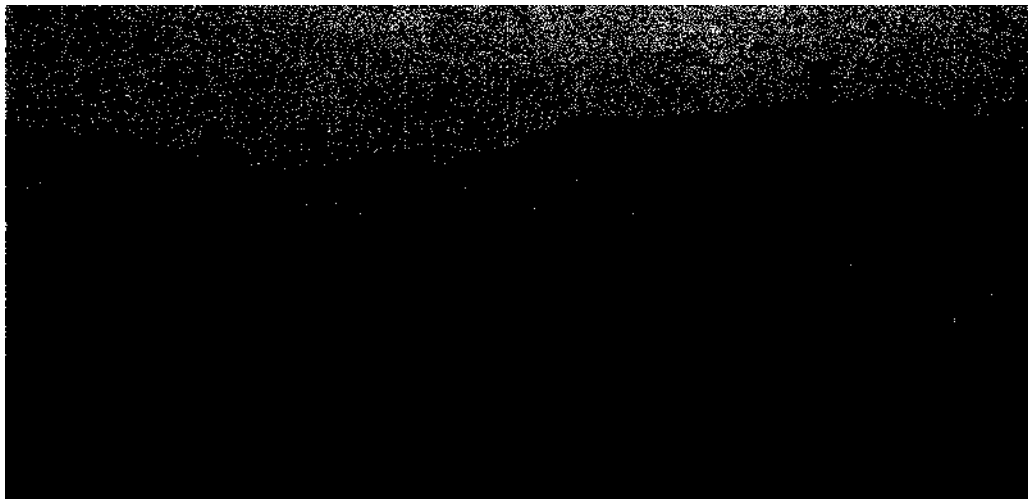


FIG. 25, OIL-WELLS IN THE PERUVIAN COASTAL PLAIN

Note the derricks, the storage tanks, and the workers' houses. The scenery is typical of the west coastal desert

By courtesy of the Peruvian Consul



FIG. 25. OIL-WELLS IN THE PERUVIAN COASTAL PLAIN

Note the derricks, the storage tanks, and the workers* houses. The scenery is typical of the west coastal desert.

By courtesy of the Peruvian Consul

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Eight miles of railway, an electric tramway, and a new road for motor traffic connect Callao with the capital, Lima (316,000), once the metropolis of Spanish South America. In his *Conquest of Peru* Prescott wrote: "Amidst the woe and destruction which Pizarro and his followers brought on the devoted land of the Incas, Lima, the beautiful City of the Kings, survives as the most glorious work of his creation, the fairest gem on the shores of the Pacific." Lima is the only capital of the Northern Andean states that is situated in the coastal belt instead of on the plateau. The mortal remains of its creator, Pizarro, lie in the cathedral that he founded in 1535. Standing on the banks of the Rimac, Lima is a city of splendid buildings, both old Spanish and modern ferro-concrete, built on a wide, fertile plain sloping gently to the Pacific, and backed by the sheltering walls of the Andes.

Mollendo (9000) is a minor port, where vessels anchor in an open roadstead. Most of its trade is connected with the interior plateau, on behalf of both Peru and Bolivia.

2. *The Andean Belt.* Between 10° S. and the Tropic of Capricorn (23° S.) the Andean belt is at its widest, and in between the chains there is a high plateau, generally exceeding 12,000 feet in height and crossed by irregular ranges. The northern section of this region belongs to Peru and the southern to Bolivia. As one ascends the western chain from the dry coastal plain the conditions become less arid, and at 3000 feet up the rainfall is sufficient to support a thin cover of trees and shrubs; at 8000 feet there is a belt of stunted evergreen forests. Above these there are mainly grasslands, those of the plateau being fairly extensive.

The northern part of the plateau is drained by the long Amazon head-streams; the south forms the inland drainage basin of Lake Titicaca. On the whole the southern part of the plateau is fairly flat, since it consists of a broad trough between the Andean chains, filled in with a great depth of soil brought down mainly by rivers, partly by winds.

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The great height of the plateau has a marked influence upon the climate and the life and physique of the inhabitants. The skies are generally clear, and in the rarefied atmosphere the night temperature usually falls below freezing-point, and the margins of Lake Titicaca are frozen. As on the plateau of Quito, the days are hot by contrast, and the difference between shade and sun temperatures is also striking. Sir Martin Conway, the famous British traveller and mountaineer, vividly describes the typical weather. He writes :

Early in the morning and late in the evening, when the sun is below the horizon, the cold is liable to be intense even in September and one suffers from almost frozen feet. In the winter, when the winds blow and the frosts are yet more severe, the dry cold is so trying that even the natives cover up their faces in thick woollen masks, and wrap shawls about their heads and *ponchos*¹ over their bodies. But as soon as the sun is a little way above the horizon, its direct rays scorch the traveller with their great heat, so that he soon begins to pray for the night, as the lesser evil of the two.

The rainfall is only about half that of the Quito region and comes almost wholly in summer (November to April), the rest of the year being extremely dry.

People unaccustomed to life at these altitudes suffer from mountain sickness, largely due to the decreased air-pressure, (about two-thirds the average pressure at sea-level) and scarcity of oxygen. Difficulty in breathing, greater rapidity of the heart-beats, loss of appetite and vigour, are common symptoms. The true natives of the plateau zone have naturally become adapted to the unusual conditions. The Aymaras, the chief people of the plateau, although only of medium stature, have excessively developed chests; they are fierce and bold, remarkably strong, and possessed of wonderful powers of endurance.

There is a great contrast between the primitive tribes of

¹ See p 105.

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the Amazon lowlands and the advanced Inca peoples found on the high plateau by the Spaniards. Owing to the rather scanty rainfall, agriculture on a large scale was only possible with irrigation, using water from glaciers and snowfields. The Inca Empire first arose in the Upper Ucayali region, but later extended over practically the whole plateau. Inca civilization was based entirely upon agriculture; maize was almost a sacred crop, the sun was worshipped as the chief factor in agriculture, and the emperor was a kind of high priest of religious ceremonies closely connected with agriculture. The potato was of great importance, and was cultivated all over the area. The llama and alpaca were the chief animals, both for their wool and as beasts of burden.

At first, owing to the mountainous nature of their country, the plateau peoples lived in separate valleys, independent of one another. Later they became united for purposes of defence and also for the carrying out of great public works, such as terracing the hillsides, building bridges, roads, and aqueducts. The remains of these works form a striking testimony to the wonderful skill and organization of the Incas. They were a peaceful people, and once their rulers had been overthrown they soon fell under the domination of their Spanish conquerors, who practically enslaved them, and wasted their lives in the heavy work of the silver- and gold-mines and in the hard tasks of transporting metals to the coast.

The inhabitants of the Peruvian plateau are still almost wholly of Indian stock, and in spite of the great developments in mining their chief occupations are agriculture and the rearing of animals. Llamas, alpacas, and vicunas (all related to the camel family) are kept on the grasslands. The llama supplies wool, and has always been important as a beast of burden, although to-day horses and mules are largely used. The alpaca and vicuna supply a wool of finer quality and greater value. There are about 500,000 llamas in Peru, 1,500,000 alpacas, and 12,500,000 sheep, but the

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vicuna is rare. Wool forms a valuable item in Peruvian trade (that of the alpaca is the most important), much of the export going to the woollen mills of Yorkshire, while the native women use large quantities in making *ponchos*. The *poncho* is a large woollen sheet with a hole in the middle through which the head may be thrust. Thus it is a combined overcoat and blanket—a useful article in the chilly atmosphere of the mountain belt.

Potatoes, maize, tobacco, wheat, and beans are common crops, with barley and quinoa (a kind of buckwheat with tiny grains) at greater heights (12,000 to 14,000 feet). These crops are consumed on the plateau itself and do not enter into international trade, but cocaine,¹ obtained from the leaves of the small coca-shrub—not to be confused with the cacao- or cocoa-tree—is made on the plateau and in Lima for exportation, mainly to Japan. The plateau Indians chew the coca-leaf as a stimulant.

Cuzco (40,000), once the capital of the Inca Empire, stands at 11,440 feet above sea-level, in a narrow, fertile river-valley leading northward to the Ucayali river, and flanked by mountain pastures supporting many animals. The city has many interesting buildings and remains of both Inca and early Spanish types. The wonderfully built stone walls of the Incas frequently serve as foundations for rude hovels of adobe² (sun-dried mud bricks).

Although animal-rearing and agriculture are the chief occupations of the plateau peoples, mining is a much more important industry from the point of view of foreign trade. Mineral veins from deep down in the earth have been thrust up into the folded rocks of the Andean chains on a grander scale than anywhere else in the world. When the Spaniards first arrived mining was not very important, but during the three centuries of Spanish rule huge quantities of gold and silver were taken out of the country. These metals are still obtained, but to-day they are merely by-

¹ Cocaine is used as a local anaesthetic, especially in dentistry.

* Pronounced 'a-d6-be.'

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products, as it were, of much more important mineral workings, the gold being exported chiefly in the contents of copper bars from a smelting-works at Oroya, south of Cerro de Pasco, which is one of the chief centres for silver, worked in connexion with copper and lead. Peru is the third largest producer of silver in the world.

Most of the mining is in the hands of United States companies, which are responsible for vastly improved methods in mining, smelting, and transport. The mestizos make excellent miners, but more workers are needed for still greater developments.

Copper is now easily the most important metal product of Peru, and, indeed, of all the Andes. The district of Cerro de Pasco, which has smelting-works, and the land to the south of that town are the most prolific regions. Working costs are reduced by the presence of gold and silver in the copper ores. Peru ranks second to North America in copper output.

Vanadium, a rare and valuable mineral used in the production of certain special steels (*e.g.*, in Sheffield), ranks third in value to copper and silver among Peruvian metal exports, and Peru supplies about 80 per cent, of the world's requirements of this metal.

Lead, zinc, mercury, bismuth (Peru shares with Bolivia the world's supply), antimony, and arsenic are other minerals of importance in export trade. Coal is mined near Cerro de Pasco for smelting purposes, so that the old handicap of fuel shortage is being largely overcome.

Cerro de Pasco (15,000), standing at 14,380 feet, is obviously the centre of one of the richest mining districts in the world, and possesses one of the largest smelting-plants.

The mountainous character of most of Peru hinders the construction of roads, of which there are very few in the country. There are about 2500 miles of railway, however, and further extensions are being effected. There are several short railways, besides two important ones. The chief railway (the Central) runs from Callao to Lima, io6

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whence it climbs through magnificent mountain scenery—surpassing the grandeur of the Alps—to 15,805 feet before descending to Oroya (12,225 feet), on the plateau. There are sixty-five tunnels, sixty-seven bridges, and fifteen zig-zags or switchbacks in only 137 miles of line! From Oroya the railway has lines running one north and one south through the mining districts.

From Mollendo the Southern Railway winds for 107 miles up the dry slopes of the Andes to Arequipa (65,000), a quaint old Spanish town lying in a beautiful valley—a sort of oasis in a desert region—at the foot of El Misti, a superb extinct volcano. The journey through irrigated lands toward Cuzco has easy gradients, although at two points it climbs above 14,000 feet before reaching the well-watered, smiling valleys of the Inca land, supporting many crops and animals. A branch southward from this railway to Puno, on the north of Lake Titicaca, gives a link, *via* the steamboats on the lake, with a line to La Paz in Bolivia, whence a railway runs through Northern Argentina direct to Buenos Aires. This transcontinental route is being used more and more.

3. *The Interior Plains.* The lower eastern slopes of the Andes (the *montana*) and the section of the Amazon lowlands on the north form about half the area of Peru. Many of the higher slopes and valleys are grasslands, but "the lower slopes, up to 5000 or 6000 feet, are densely forested, the rainfall being actually greater than in the lowlands.

The whole region is thinly peopled. The inhabitants are chiefly native Indians, with a number of mestizos and a few white men. Development is only beginning, and consists mainly of collecting the natural products of the forests. Rubber, once an important export, has declined to an insignificant place, owing to the competition of the plantation rubber of Malaya and the East Indies. Attempts are being made to establish plantations in Peru. The supply of balatd gum has also diminished, for the native collectors fell the trees instead of tapping them.

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Cinchona, or Peruvian bark, obtained from a tree in the montana, is the source of quinine, a valuable medicine. But the industry has sadly declined in Peru, owing to the usual causes—ruthless destruction of the trees and the competition of the cinchona plantations of Ceylon.

Nevertheless, there still remains untold wealth in hard and soft timbers (cedar, oak, mahogany, etc.), of which only small quantities are sent down the Amazon from the saw-mills of Iquitos. Oil-palms, fibre-plants, vegetable ivory-nuts, cacao, vanilla,¹ and many other useful commodities are present in abundance.

The Peruvian Government is trying to attract good European settlers to these valuable eastern territories. Plantations of coffee, cacao, cotton, and sugar have been established with native workers. Connexion with the Pacific coast is extraordinarily difficult, but fortunately many tributaries lead down to the splendid waterway of the Amazon.

Iquitos (25,000), standing on the left bank of the Amazon, below the junction of the Marañon and Ucayali, is 2300 miles from the Atlantic and about half that distance from Lima. It has regular steamship connexion with Para, the Brazilian port for the Amazon. Iquitos is a great collecting centre for the exportation of rubber, cotton, timber, and ivory-nuts, and has mills for preparing these products.

BOLIVIA

The name Bolivia at once reminds us that this country is one of the five liberated from Spain by Simon Bolivar in the early nineteenth century. The republic was proclaimed in 1825, Bolivar becoming first President. Bolivia, with an area of over 500,000 square miles (more than four times the size of the British Isles), is the fourth largest state of South America. Its population, however, is only

¹ Vanilla is the dried sheath-like fruit of a tropical orchid, in great demand as a flavouring material

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about 2,800,000, of which one-half are Indians and over one-quarter mestizos. As in Ecuador and Peru, it is the small body of Europeans—mainly of Spanish descent—who form the governing classes; it is they who are responsible for the development of their country. So far progress has been very slow indeed, owing to lack of sea-coast, transport difficulties, wars, boundary disputes, revolutions, and shortage of labour, capital, and organizers. The ownership of a big stretch of territory in the Chaco region is still in dispute with Paraguay, and an outbreak of war was avoided in 1928 only by the prompt intervention of the Pan-American Union and the League of Nations.

We ought to learn something of Bolivia, since about 80 per cent, of its exports come to Great Britain, as compared with only 9 per cent, to the United States. The future development of Bolivia should mean an even greater volume of trade with our own country, which supplies only 12 per cent, of the imports (manufactured goods).

1. *The Andean Belt.* The lofty Bolivian plateau, over 12,000 feet above sea-level, is really a continuation of that of Peru, flanked by two great ranges and covered with a deep layer of sediments. The mountains of the eastern range are very high, several peaks exceeding 21,000 feet. The drainage of the plateau has no outlet, the rivers flowing to Lake Titicaca in the north or Lake Poopo in the centre, while many long rivers flow from the eastern range, or Cordillera Real ('Royal'), to the Madeira, the greatest Amazon tributary, and the Pilcomayo flows south-eastward to the Paraguay.

The climate of the Bolivian plateau has already been described in the account of Peru. The range of temperature between day and night is far greater than that between winter and summer. The winter months, especially May, June, and July, are very dry/and the rain that falls in summer is brought by dense thunderclouds that drift over from the wet Amazonian region lying east of the Cordillera Real. The rivers come down in flood during

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the rainy season, and Lake Titicaca rises about five feet above its winter level. The southern part of the plateau is mainly desert, and the rainfall is rather scanty everywhere. Consequently most of the plateau only supports coarse tufted grasses and scrub plants.

As in the other Northern Andean states, the majority of the population of Bolivia is to be found in the highland region. Indeed, 80 per cent, of the population live at an altitude of over 10,000 feet above the sea. The clear, bracing air is remarkably healthy, and the Bolivians are noted for longevity: there are usually over 1250 people whose age exceeds 100 years.

From the point of view of international trade agriculture on the plateau is unimportant. Crops like maize, tobacco, and cotton are grown simply for home requirements, and additional supplies of sugar, wheat, and other foods have to be imported from Peru or Chile. Coffee of excellent quality is cultivated in the high valleys of the Eastern Andes. These *valles*, as they are called in Bolivia, have excellent soils and ideal climate, and will some day support a dense agricultural population.

As in Peru, there are many llamas—used as pack-animals and also as a source of wool—alpacas, sheep, goats, donkeys, mules, horses, pigs, and cattle, although in every instance the numbers of these animals are much smaller than those of Peru. Alpaca wool and furs from the vicuna, chinchilla (a small grey rodent), and red fox are exported.

Mining is easily the most important industry of the region, and minerals compose about 90 per cent, of the exports in value. In one vital respect mining is at a great disadvantage when compared with agriculture and animal-rearing. Farming is a perpetual occupation: its products can be obtained for thousands of years—for ever, in fact. But mining is an industry that must inevitably cease some day, owing to the exhaustion of the mineral deposits. There are still immense quantities of minerals in Bolivia,

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but the supplies that are readily accessible are being worked out, and as time goes on the difficulties to be encountered will become ever more formidable. Many deposits exist at such great altitudes that it is hard to see how they can ever be worked with economy.

Tin is by far the most important mineral, all the others combined only accounting for about 10 per cent, of the exports. Bolivia is the second greatest tin-producing country, following the Straits Settlements of Malaya, and accounting for almost one-quarter of the world's production. The tin-mines lie along the eastern side of the plateau, from Lake Titicaca to Lake Poopo, around La Paz, Oruro, and Potosi. The chief handicaps to be overcome are the difficulties of transport, the great heights at which the metal ores lie, the scarcity of labourers, and the shortage of fuel. Most of the tin ore is shipped to Great Britain for smelting.

The value of the silver obtained to-day is much less than that of the tin with which it is commonly found. In the days of the Spanish occupation silver was the main production, and tin was disregarded. A great deal of tin (and silver too) has been obtained by merely working over the old refuse dumps from the silver-mines. The big decline in the price of silver during the present century—except for an artificial jump in prices due to the Great War—has greatly affected the industry, and at present silver is little more than a by-product of tin-mining.

Copper (including deposits of the native metal at Corocoro), lead, bismuth, antimony, wolfram (the source of the rare metal tungsten, used in special steels), and zinc are also mined for export in the eastern part of the plateau. Gold is found, but the quantity is insignificant. Unfortunately, coal is not available, and this constitutes a grave handicap, owing to the high cost of imported coal. Diesel heavy-oil engines are used for power, but probably hydro-electric power * will later become important in the mining

¹ I.e., electric power generated by water-power.

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industry. Oil deposits near Lake Titicaca and the eastern range will shortly be tapped.

La Paz (143,000), standing 10,500 feet above the sea, is the largest city of the republic and the highest metropolis in the world. Its name, 'the Peace,' commemorates the peace treaty signed after the final overthrow of the Spanish forces. La Paz is excellently situated in a valley where routes meet from Lake Titicaca, the Upper Madeira, and the plateau region to the south. Hence it is the chief market and commercial centre, with fine buildings, electric trams, and omnibuses. A railway links it directly with the Chilean port of Arica; steamboats on Lake Titicaca permit journeys by the Peruvian railway to Mollendo; a longer route goes *via* Oruro to the port of Antofagasta (formerly Bolivian, now Chilean); international trains run twice a week to Buenos Aires.

Lake Titicaca is the highest navigable waterway in the world. The comfortable lake-steamers, owned by a British company, were made in England and transported in sections from the coast.

Sucre (34,000) is the official capital of Bolivia, and the centre of its legal, educational, and religious life. This handsomely built city is joined by a fine motor-road to Potosi, from which the railway is now being extended to the capital.

Cochabamba (35,000), an important agricultural centre, is joined by railway to Oruro (40,000), the centre of the Bolivian railway system, lying in the heart of the tin-mining districts. Potosi (35,000) lies farther south, in the centre of the silver-mining region. Some of its mines have been productive for four centuries.

2. *The Interior Plains.* The montana of Peru is continued in Bolivia, where the hot valleys, up to about 5000 feet (known as yungas), produce sugar, cacao, rice, vanilla, and coca, the last named being the chief agricultural item of the region. The Bolivian section of the Amazon forests supplies the usual hardwoods, but rubber is the

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to open up a region that is bound to become important in the future.

EXERCISES

1. Repeat Exercise 1 in Chapter VI for Ecuador, Peru, and Bolivia.

2. Draw sketch-maps to show the position and importance of (a) Quito and Guayaquil, (b) Lima and Callao, (c) La Paz. Add brief notes on any points that your maps fail to reveal.

3. The imports of Peru in 1928 amounted (in millions of pounds sterling) to £17·6, the chief items being iron, steel, machinery, tools, etc.; food amounted to £5·1, drink to £3·6, and textiles (mainly cotton goods) to £2·9. The exports (in millions of pounds) amounted to £31·5, mainly petroleum (£11·3), cotton (£5·7), copper (£5·4), sugar (£3·6), wool (£1·1), and silver (£0·5). Show these figures in diagram form, and add brief explanatory notes.

CHAPTER VIII

THE UNITED STATES OF BRAZIL

CABRAL, the Portuguese navigator, accidentally reached Brazil in 1500 on his way to the East, thus giving Portugal—in accordance with the Treaty of Tordesillas (1494)—a tooting in South America. At first it was thought that Cabral had discovered a large island, one of the fabled stepping-stones to India. Later, when a red dyewood similar to the Brazil wood of Asia had been discovered, the name Terra de Brasil ('Land of Red Dyewood') was applied to the region. As the Spaniards were devoting themselves mainly to the Andean zones, the Portuguese were able to acquire the whole of the great eastern shoulder of South America. But for over 300 years Portugal took little interest in her colony, and practically no progress was made in its development, partly because Portugal has never had a population large enough to undertake the settlement of so vast a territory. It was the discovery of gold that first led Portugal to take even a limited interest in Brazil, and during the sixteenth, seventeenth, and eighteenth centuries the country was explored for minerals.

Between 1815 and 1822 Brazil was a self-governing kingdom attached to Portugal; from 1822-89 it flourished as an empire, the second (and last) emperor being a ruler of enlightened views. Under his guidance Brazil began to prosper, so that when he gave up the throne in

and

Brazil became a republic (the United States of Brazil), fashioned on the model of the United States of America the foundations of modern development had been firmly laid. 1

The fourth largest country in the world, and the largest republic in South America, Brazil has an area of 3,275[^]10,

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square miles, or about three-sevenths of the whole continent. It is thus larger than Australia or the United States, and about four-fifths the size of Europe. Brazil extends 2600 miles from east to west, and about the same from north to south—that is to say, about the distance from Liverpool to Quebec. Its Atlantic coastline measures over 4000 miles.

(The population of Brazil is about 40,000,000 concentrated chiefly in the eastern and south-eastern parts of the country, immense tracts, in the interior carrying only a very scanty population.) It seems probable that the population will be doubled within twenty-five years. It is estimated that the natives on the Brazilian highlands and the scattered tribes of the Amazon lowlands number less than 800,000. Most of the white peoples are of Portuguese descent, but there are over 1,000,000 Italians, besides large numbers of Spaniards, Germans, Turks, and Japanese. In the northern states a considerable proportion of the population is of mixed blood, the chief elements being Portuguese and African negroes. The latter were introduced as slaves from 1574 onward, to work in the mines or on the tropical plantations. Slavery was finally abolished in 1888, but no permanent serious consequences followed, as the slaves in general had been well treated, and became free citizens on terms of full equality with European settlers: there is no 'colour' problem in Brazil, as there is in the United States. To-day, however, the negroes are not playing a big part in the actual development of Brazil. The modern workers are in the main the industrious peoples of Southern Europe, many of whom come over for special harvesting work, returning afterward to their own countries, sometimes passing first to the wheat harvests of the Argentine.

The common language of Brazil is of course, Portuguese, although in the southern states Italian and German are important as the tongues of numerous settlers.

During the first fifty years of its independence Brazil

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was the chief South American producer and exporter of tropical crops such as cane-sugar and cacao. The abolition of slavery, which made the question of labour-supply—for a time—more difficult than before, occurred just about the time that beet-sugar production developed on a big scale in Europe and food-supplies, both tropical and temperate, were being enormously increased in other parts of the world, such as North America, West Indies, and Africa. Brazilian trade had a set-back, therefore, in the last quarter of the nineteenth century. Thanks very largely to the introduction of large-scale coffee production during the same period, however, the present century has been a time of ever-increasing prosperity. Not only has there been a considerable advance in the production of food-stuffs and raw materials, but there have been extraordinary developments in manufacturing industries dependent upon hydro-electric power.

At the present day the annual import and export trades of Brazil each represents value of approximately "£100,000,000. Of the exports, coffee alone accounts for over 50 per cent of the value. Nearly half the imports consist of manufactured goods—machinery, iron and steel, cotton goods, motor-cars, etc.—while a large quantity of wheat is imported from Argentina."

(The United States take about half the Brazilian exports. Great Britain receives comparatively little, although she supplies Brazil with about one-fifth of her needs, as compared with one-quarter from the United States. In 1913 Great Britain furnished 24.4 per cent., Germany 17.4 per cent., and the United States 15.7 per cent, of Brazilian imports. But the Great War cut off Germany's trade completely; and greatly hampered that of Britain, so that the United States were able to increase their share of Brazilian trade at the expense of their European rivals. It is interesting to observe that of the £500,000,000 invested in Brazil by foreign countries no less than £300,000,000 is British, and only £50,000,000 from the United States.

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Physically Brazil is composed of two regions roughly equal in area, but strikingly different in character: the Amazon lowlands and the Brazilian highlands. It would



FIG. 28. THE NATURAL REGIONS OF BRAZIL, WITH THE CHIEF RIVERS AND TOWNS

I, the Amazon lowlands II, the interior Brazilian plateau III, the north-eastern region IV, the coffee region V, the southern temperate region.

be possible to distinguish a great number of natural regions in a country so large as Brazil, but for our purpose it will be sufficient to recognize only five: (1) -the Amazon lowlands, (2) the interior Brazilian plateau, (3) the north-eastern region, (4) the coffee region, (5) the southern temperate region.

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but there is an infinite variety of other plants, and the undergrowth is an almost impenetrable mass. Creepers swarm up the trees, lashing them together with rope-like festoons, ever striving to break through to the sunlight and air above the dense roof of branches and leaves, where they may flower in all their exquisite beauty. The selvas have an attraction of their own, but it is of a sombre, depressing kind.

There is a grandeur and solemnity in the tropical forest, but little of beauty or brilliancy of colour. The huge buttress trees, the fissured trunks, the extraordinary air roots, the twisted and wrinkled climbers, and the elegant palms, are what strike the attention and fill the mind with admiration and surprise and awe. But all is gloomy and solemn, and one feels a relief on again seeing the blue sky and feeling the scorching rays of the sun. It is on the roadside and on the river's banks that we see all the beauty of the tropical vegetation. There we find a mass of bushes and shrubs and trees of every height, rising over one another, all exposed to the bright light and the fresh air, and putting forth, within reach, their flowers and fruit, which in the forest only grow far up on the topmost branches. Bright flowers and green foliage combine their charms, and climbers with their flowery festoons cover over the bare and decaying stems.¹

In this world of riotous plant life there can be no freedom of movement except on the rivers, which form the only breaks in the continuity of tangled vegetation and supply the only easy natural routes. Animal life must clearly be adapted to the conditions described. The rivers abound in fish, alligators, and turtles; the swamps and luxuriant undergrowth teem with frogs, snakes, leeches, ants, and other crawling insects. Butterflies of amazing size and beauty float in the stifling air, and there is an endless variety of creatures suited to life above ground among the trees. There are monkeys that use the tail as a fifth hand; sloths which sleep in the daytime hanging upside-down,

¹ Dr A. K. Wallace, *Travels on the Amazon*.

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but there is an infinite variety of other plants, and the undergrowth is an almost impenetrable mass. Creepers swarm up the trees, lashing them together with rope-like festoons, ever striving to break through to the sunlight and air above the dense roof of branches and leaves, where they may flower in all their exquisite beauty. The selvas have an attraction of their own, but it is of a sombre, depressing kind.

There is a grandeur and solemnity in the tropical forest, but little of beauty or brilliancy of colour. The huge buttress trees, the fissured trunks, the extraordinary air roots, the twisted and wrinkled climbers, and the elegant palms, are what strike the attention and fill the mind with admiration and surprise and awe. But all is gloomy and solemn, and one feels a relief on again seeing the blue sky and feeling the scorching rays of the sun. It is on the roadside and on the river's banks that we see all the beauty of the tropical vegetation. There we find a mass of bushes and shrubs and trees of every height, rising over one another, all exposed to the bright light and the fresh air, and putting forth, within reach, their flowers and fruit, which in the forest only grow far up on the topmost branches. Bright flowers and green foliage combine their charms, and climbers with their flowery festoons cover over the bare and decaying stems.¹

In this world of riotous plant life there can be no freedom of movement except on the rivers, which form the only breaks in the continuity of tangled vegetation and supply the only easy natural routes. Animal life must clearly be adapted to the conditions described. The rivers abound in fish, alligators, and turtles; the swamps and luxuriant undergrowth teem with frogs, snakes, leeches, ants, and other crawling insects. Butterflies of amazing size and beauty float in the stifling air, and there is an endless variety of creatures suited to life above ground among the trees. There are monkeys that use the tail as a fifth hand; sloths which sleep in the daytime hanging upside-down,

¹ Dr A. R. Wallace, *Travels on the Amazon*.

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securely anchored to a branch by their hooked claws; jaguars, or South American leopards, which spend most of their life in the trees, preying upon monkeys; birds, including parrots of brilliant plumage and raucous voice and beautiful birds of paradise.

The very luxuriance of plant life leaves little room for large animals; indeed, apart from the swarming insects and reptiles, the explorer is usually struck by the apparent rarity of animal life. Primitive man too finds it difficult to live under such conditions, and, apart from a few scattered Indian tribes rather low in the scale of civilization) the remoter regions of the Amazon forests are devoid of population. Yet Dr A. R. Wallace, the great naturalist, maintained that civilized, industrious people could live in luxury in forest clearings with very little work, owing to the amazing productivity of the soil and climate.

Many Indians and mestizos gain a livelihood by collecting forest produce, such as rubber, cacao, nuts, and sarsaparilla,¹ for white traders. Others have plantations on which they grow cacao, sugar, mandioca, maize, rice, and tobacco. By crushing, washing, and drying the mandioca roots they obtain manioc² flour, one of the chief items in their diet.

Those tribes who have had no close contact with Europeans are often as primitive as the pygmies of Central Africa. The home may be a hut of sticks and mud, materials all too common in the forests, and here the women may practise a little primitive agriculture. Clothing is unnecessary; food can be obtained from wild fruits and roots, while birds, monkeys, and other forest creatures, and fish from the rivers, provide the flesh that forms the staple diet. A few of the Indians are still lower in culture; they wander through the forests in search of food, to obtain which they may attack settled tribes. They cross

¹ Sarsaparilla is a dried root used in making a medicinal drink.

² Tapioca is a preparation of manioc flour or farinha. Mandioca-is also called cassava.

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rivers in canoes roughly shaped from logs felled for the purpose, and possess no settled home.

So great are the obstacles to human settlement that in the whole of the vast Amazon lowlands there are little more than one million people—about the population of Birmingham or Glasgow—and of these fully one-third are in the region around the mouths of the river. Communication is necessarily carried on almost entirely by water. There is only one short stretch of railway, constructed for the purpose of bringing rubber from the headstreams of the Madeira river to a point below the Madeira (or Sao Antonio) Falls.

Rubber. There are in Brazil at least three important kinds of rubber, one of which (balat<L) has already been mentioned. Balata gum of high quality is obtained from the basin of the river Negro, north of Manaos, the chief centre for both Brazilian and Peruvian balatd.

The most important rubber is that of the hevea-tree, found in large numbers, mixed with a huge variety of other trees, along the banks of the rivers, especially in the western part of the Amazon lowlands. As movement in the forests is almost impossible during the flood season, rubber-collecting can only be carried on for six or seven months (May to November).

The collectors are generally Portuguese or Portuguese-Indian half-breeds, who work for the owner of a stretch of forest land. They build a *seringal*, or village, upon a piece of rising ground—safe from floods—near the river-side. Narrow paths are cut through the densely entwined vegetation, linking up the scattered rubber-trees—often fine old specimens of 60 to 80 feet in height and 3 to 12 feet in circumference near the ground. The *seringueiro*, as the worker is called, clad usually in an old felt wideawake hat, cotton shirt with open neck, and trousers tied round the ankles, sets out each morning at about four o'clock, with his small axe and big stock of tin cups. He makes gashes in the bark of each rubber-tree that he reaches, and

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sticks under each wound a tin cup into which the milk or latex may drain. A second tour of the trees is made in order to collect the latex into a big tincan, with which the



FIG 30 TAPPING A RUBBER-TREE NEAR
MANAOS

Observe the special axe employed in tapping and the small tin cup fastened to the tree.

II v courtesy of the Booth Line, Liverpool

seringueiro returns to his rude thatched hut after about six hours' work. After a meal of dried beef and beans—the diet is very monotonous—he has to coagulate or harden the latex. A layer of rubber is wrapped round the blade of

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a paddle-shaped piece of wood. This end is then dipped into the latex and held in the thick, hot smoke of a fire of palm-nuts, so that the latex may be hardened and cured. These operations are repeated until the whole of the latex has been converted into a solid ball of rubber. On Saturday the *seringueiro* takes his rubber to the manager's office at the *seringal*, whence it can be dispatched to one of the great collecting centres, like Manaos or Para. This "up-river, hard-cured fine Para" rubber, as it is called, is regarded as the best in the world.

The rubber-collectors lead a hard and unhealthy life. Their masters often charge them exorbitant prices for their food and outfit, and pay as little as possible for the rubber.

Up to the end of the nineteenth century Brazil was the greatest rubber-producer in the world. Since then there has been both an actual and a relative decline in the quantity exported. From over 50 per cent, of the world's output in the early years of the twentieth century, Brazil's share in rubber-production has gone well below 10 per cent. The wild rubber of the Amazon forests, despite its fine quality, has found it very difficult to compete with the enormous quantities produced so cheaply on the plantations of British Malaya and Ceylon and of the East Indies, where excellent labourers are abundant. Careless bleeding of trees—even to the extent of felling them—has also damaged the Brazilian industry. Any attempts to establish rubber plantations in Brazil must depend upon a good supply of reliable labour.

It is interesting to recall that the Asiatic rubber plantations were established from hevea-seeds smuggled out of the Amazon forests in 1876—as "exceedingly delicate botanical specimens specially designated for delivery to Her Britannic Majesty's own Royal Gardens of Kew"—by Henry Wickham,¹ the Englishman who first realized the possibilities of plantation rubber.

¹ Sir Henry Wickham died in September 1928, at the age of eighty-two.

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With the declining importance of rubber it is natural that the collection of other forest produce is increasing. At present the chief item next to rubber is Brazil nuts. Collectors go up the rivers, especially the long tributaries from the Brazilian highlands, in boats, and simply gather the ripe pods that have fallen to the ground. Each pod weighs two to four pounds and contains fifteen to thirty nuts, remarkably rich in oil (about 75 per cent.) and very nourishing. The chief risk attached to the industry is that the nut-trees are the tallest in the forests, and the ripe fruit may fall perhaps 200 feet, and the collector must be both alert and agile! The nuts form an important food in Northern Brazil, and are exported for consumption as fresh fruit and for making confectionery and salad oil, over half the exportation going to the United States.

The timber of the Amazon forests is still unimportant, although hard and cabinet woods are exported, mainly to North America. The lighter woods can be made into rafts to carry the massive timbers that are too heavy to float. Some day these forests will be a source of untold wealth in wood alone, and it should be noticed that the Amazon mouth is nearer to the English Channel than are the ports of the Gulf of Mexico or West Africa.

Probably the greatest store of vegetable oils in the world exists in the Amazon lowlands. There are many nuts and seeds yielding oil of value in making margarine, soap, and candles. One kind of tree can be tapped for oil that closely resembles turpentine. Plants of value in medicine are also abundant. One of the chief is cinchona, the source of quinine.

The life and trade of the Amazon lowlands is concentrated at a few ports. Manaus (75,000) is an important river-port standing on the river Negro, just above its junction with the Amazon, about 1000 miles from the Atlantic, and reached from Para by steamship in four days. This well-built, modern city is the collecting point for the products of a huge area that is tapped by the great tribu-

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fresh meat or 'jerked' beef—that is, meat cut into strips and dried in the sun—for the home market, while increasing numbers are exported to Europe as chilled, frozen, or salt beef.

Agriculture is unimportant, although mandioca, maize, rice, and beans are grown for home consumption. Forest



FIG. 32. ZEBU CATTLE ON A CENTRAL BRAZILIAN RANCH
Zebu cattle, either pure or crossbred, form the bulk of those slaughtered for meat on the Brazilian campos. Study the typical savanna landscape.

By courtesy of the " Manchester Guardian Commercial "

products have not been exploited, except for the ipecacuanha plant, growing in clumps in the south of Matto Grosso. Ipecacuanha wine is valuable in medicine, and Brazil has almost a monopoly of the supply.

Of the vast stores of mineral wealth only gold and diamonds are of any importance at present.

The long ridge separating the northward- and southward-flowing rivers forms the natural approach from the coastal region, and the only towns of any size are found on or near it. Cuyabi (20,000), the capital of Matto Grosso

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State, is a centre for cattle, gold, and diamonds. Corumba (10,000), the chief commercial city of the same state, stands on the Paraguay river, and has regular steamer communication with Buenos Aires. It is also linked by railway with Sao Paulo City. Matto Grosso (5000) has some trade in rubber, medicinal plants, and minerals, and is a military station near the Bolivian frontier. Goyaz, capital of Goyaz State, is another cattle centre, joined by railway with Rio de Janeiro.

Faith in the ultimate importance of the great heart of Brazil has led to the setting apart of a district in the south-east corner of Goyaz State as the site of the new capital that shall arise in the distant future, more centrally placed than Rio de Janeiro, the present capital.

3. *The North-eastern Region.* This region consists of the states that lie in the north-eastern shoulder of Brazil, the chief two being Bahia and Pernambuco. The core of the region is part of the Brazilian plateau, through which the Sao Francisco—known, because of its summer floods, as the 'Brazilian Nile'—has cut a wide, deep, steep-sided valley. The plateau slopes gently to the north, more steeply to the narrower coastal plain on the east, with many comparatively short rivers flowing across the coastlands. The climate is always hot, and there is a marked dry season. The coastal plains are forested, save where clearings have been made for plantations of tropical crops.

The middle course of the Sao Francisco and the land north of its great bend are remarkable for the smallness and uncertainty of the rainfall. Tangled thorny bushes, stunted prickly acacias, and cacti are typical of the region. The northern part is the land of *caatingas*, dreary, dry thornwoods, green and flowery for a few months, but appearing lifeless during the long dry season.

The Brazilian Government has attempted to lessen the dangers of drought, which formerly led to serious losses of animals and men, by constructing many reservoirs for water-storage.

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The chief occupation on the plateau area is the rearing of cattle and goats, tended by the hardy natives. The cattle supply meat to the coastal plantations, while hides and goat-skins are exported.

Carnauba wax, obtained from the young leaves of a palm that flourishes in this dry region, is used for candle-making in Brazil, and is exported for electrical insulation



FIG. 33. AN EXPERIMENTAL STATION FOR COTTON-GROWING,
RIO GRANDE DO NORTE

By courtesy of the " Manchester Guardian Commercial "

work. The wholesale destruction of the palms may ruin the industry unless large plantations are set up.

On the tropical coastlands cultivation is the most important industry. Maize, mandioca, and fruit are widely grown, but do not enter to any great extent into export trade.

Cotton is grown throughout all the eastern states of Brazil as far south as Sao Paulo, but 80 per cent, of the crop comes from the north-eastern states. Cotton-growing was stimulated in Brazil by the shortage experienced

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during the North American Civil War (1861-65), when the Brazilian supply helped to keep the Lancashire mills working ; but lack of labour and capital, the destructiveness of pests, rather primitive methods, and occasional droughts have combined to hinder the progress of the industry. Now, however, the Brazilian Government is doing its utmost to encourage the cultivation of cotton of high quality. Eight experimental stations and twenty-five seed-farms have been established, and when the problems of labour-supply, more extensive irrigation, and more efficient transport have been solved Brazil, which already produces two-thirds of the South American crop, will undoubtedly become one of the world's greatest cotton-growers. A small amount of the finest cotton is exported from Pernambuco, but all the rest is manufactured into cloth in the mills of Rio de Janeiro, Sao Paulo, Pernambuco, and Bahia.

^An enormous area of Brazil has the moist, hot climate and light, rich soil required for the cacao-tree, and Brazil ranks second to the British Gold Coast as the greatest producer. The chief area is Bah'a State, and the port of Bah'a is the great centre of the trade. The quantity exported in the last few years is over three times that of Ecuador. About half the exportation is to the United States. \

Tobaexo cultivation was introduced by the early Portuguese colonists, and for three hundred years provided one of the leading products. During the last fifty years it has been overshadowed by other crops. Bahia State, which grows half the crop, is noted for tobacco-leaves suitable for making cigars. About halfjhe tobacco growa in_ Brazil is e^orted^chiefly-through Balm.

Sugar is also widely cultivated, but, despite a rapid increase during the World War, the present crop barely exceeds that of the late nineteenth century, and the surplus available for export is very small.

The development of this north-eastern region is greatly

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hampered by lack of efficient transport. The Sao Francisco river is navigable on the plateau, above the Paulo Affonso Falls, but the other rivers are of little use. The railways are largely isolated lines running inland from ports. The coastline is regular, with few good harbours,



FIG. 34. CUTTING SUGAR-CANE IN THE HINTERLAND OF
RIO DE JANEIRO

By courtesy of the " Manchester Guardian Commercial "

and most of the trade is concentrated in two ports: Pernambuco and Bah'a.

Pernambuco (238,000), often called Recife (the 'Reef')¹ from the peninsula on which part of the city is built, is the first port normally touched by passengers to Brazil. It is a beautiful city, with an unusual type of harbour, sheltered by a narrow reef rising a little above sea-level and stretching parallel to the beach for 300 miles. The sheltered channel, about a mile wide, is reached-through a gap in the reef. Pernambuco is the outlet for a hinterland producing

¹ The Brazilians call the city Recife, but Pernambuco is the name usually employed in England.

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large quantities of sugar, cotton, maize, coffee, and fruit, hides, and skins. Sugar is to Pernambuco what coffee is to Sao Paulo. Sugar-refining and cotton-manufacturing are important industries. Railways, owned by an English company, link Pernambuco with smaller ports to the north and south, while motor-roadways run into the interior of the state. The position of the city on the most easterly part of South America, nearest to Europe, will ultimately make it a great air-port.

Bahia (283,000), or, to give it its full title, Bahia de Sao Salvador de Todos os Santos (' Bay of the Holy Saviour of All Saints'), is a picturesque city built on the rising shores of a magnificent deep-water bay, over 700 square miles in extent—bigger than Hertfordshire, or six times the size of London County. As the port for one of the richest Brazilian states it has a big export of many products, tobacco and cacao being the chief. As is generally the case with such ports, there are important industries based upon the products of the hinterland: sugar-refining, alcohol-distilling, cigar- and cigarette-making, tanning, cotton-spinning and weaving. An important railway runs north-west to the Sao Francisco, which cannot be navigated to the coast owing to the falls.

4. *The Coffee Region.* The most important region of Brazil is the south-eastern corner, lying around the Tropic of Capricorn, and including the two large states of Minas Geraes and Sao Paulo. The parts nearest the coast are the most densely peopled and best-developed sections of the whole country.

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From the narrow coastal plain there is a steep ascent the Brazilian plateau, which is here fairly level, and is drained westward by long tributaries of the Parana. The region is exposed to the south-east trades, so that on the coastal plain the air is always moist, although the rainfall is not heavy and great extremes of temperature are unknown, while on the rising slopes behind, as in the Serra do Mar, there is excessive rainfall (over 100 inches a year).

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On the plateau the climate is healthy and invigorating. The heat is rarely extreme, the winters are mild, with occasional frosts, and the rainfall is ample for a great variety of crops.)

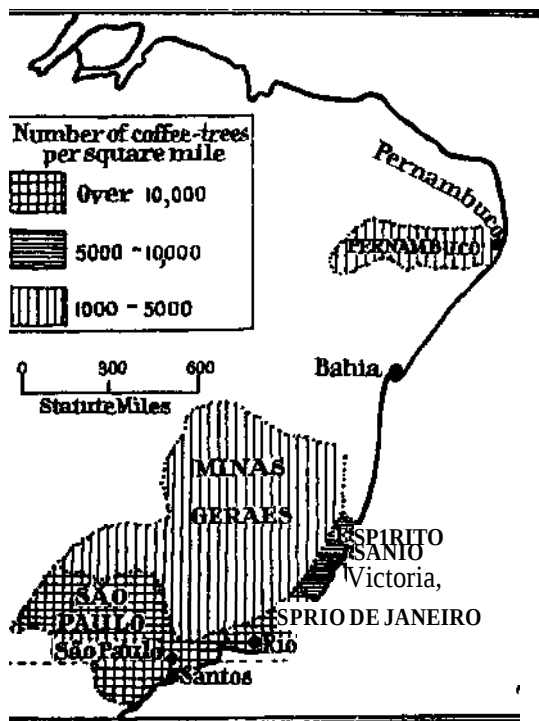


FIG. 35. THE CHIEF COFFEE STATES OF BRAZIL

Originally the region was covered with tropical forests in the wetter parts and open savannas on the drier parts of the plateau. The timber is used for many purposes, but, owing to the absence of good coal-supplies, it is chiefly consumed as fuel, even in locomotives in the interior of the region. One of the handicaps faced by Brazil is lack of

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good fuel supplies. The coalfield of Sao Paulo State furnishes only inferior types of coal, suitable for the production of coal-gas.

This south-eastern region is important for agriculture, cattle-rearing, mining, and manufacturing. It is the only



FIG. 36. YOUNG COFFEE-PLANTS IN THE NURSERY ON A BRITISH ESTATE IN SÃO PAULO

By courtesy of the "Manchester Guardian Commercial"

part of Brazil that possesses a good network of railways and fine motor-roads.

(Coffee is the most important product of all, representing nearly three-quarters of the value of exports from the whole of Brazil. Coffee is a subtropical crop, and the lands lying between 1500 and 2500 feet in South-east Brazil have a climate highly favourable for its production. Possibly the greatest advantage in this region, however, is the thick layer of dark red soil, rich in iron, and thus especially suited to the coffee-plant. Probably no other country, in

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the world has such extensive areas fit for coffee-growings
It is not surprising to find, therefore, that Brazil produces
about 70 to 80 per cent, of the world's coffee crop] Occa-



FIG. 37. A COFFEE-TREE, SAO PAULO

By courtesy of the "Manchester Guardian Commercial"

sional damaging frosts and the ravages of a pest are the
chief handicaps in Brazil. (Half of the Brazilian production
is from one state, Sao Paulo, while Minas Geraes produces
one-quarter.)

The labourers in the coffee region are the vigorous

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descendants of the early Portuguese settlers and the fine native Indians, and also large numbers of Italians from Lombardy, who are proving most efficient workers.

The prosperity of the coffee trade means so much to Brazil that the Government has always helped the industry as much as possible, and since 1924 an organization has



FIG 38. A COFFEE ESTATE IN SAO PAULO

By courtesy of the "Manchester Guardian Commercial"

been set up to regulate the amounts of coffee exported from each state and to prevent the exportation of such great quantities as would lead to a big fall in world prices and consequent loss to the Brazilian planters.

Over half the Brazilian export of coffee goes to the United States. France takes over 10 per cent., but Great Britain receives only about one-fourteenth per cent.

Devotion to the production of coffee has in the past meant neglecting other crops for which South-eastern Brazil is fitted, but agricultural developments are now going on in other directions.

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Cotton, an important crop in Sao Paulo State during the North American Civil War, declined until recent years, when it is again being extensively grown as an alternative crop to coffee. The cotton helps to supply the mills of Sao Paulo and Rio de Janeiro.

Rice, sugar, maize, and beans are grown in big quantities, almost wholly for the workers of the country. It is a



FIG. 39. MILLIONS OF COFFEE-BERRIES ON THE DRYING TERRACES OF A SAO PAULO FAZENDA

Notice the regular rows of coffee-trees in the background.

By courtesy of the " Manchester Guardian Commercial "

common practice to economize land by planting beans in between the rows of coffee- or maize-plants.

The rearing of silkworms upon mulberry-trees is developing, especially on the coffee estates, the silk finding a ready market in the Brazilian spinning factories.

Fruits flourish excellently in Brazil, but only quite recently have they entered to any extent into international trade, mainly because in the past efficient arrangements for packing and exporting did not exist. Oranges of remarkably fine quality, bananas, and pineapples are exported in increasing quantities, especially from the states

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of Sao Paulo and Rio de Janeiro. More and more of the fruits, especially oranges, are reaching Great Britain.

Cattle-rearing, once the chief occupation, is still very important. Large numbers of cattle are sent by train to be fattened for the home meat-supply, or to be exported from the freezing-works of Sao Paulo and Santos. The exportation of chilled and frozen meat is rapidly increasing. Minas Geraes has also large numbers of horses and pigs.

Mining is another important occupation, above all in the ancient rocks of the state of Minas Geraes—'Common Mines' in the early days. At first transport difficulties led to the getting of precious metals and stones only. Gold (not exported) and diamonds have long been important—observe the place-names Diamantina and Ouro Preto ('Black Gold'). The greatest mineral wealth, however, lies in the immense stores of manganese¹—probably the greatest in the world—exported from Rio de Janeiro to the United States, and iron (haematite and magnetite), at present of little importance owing to lack of cheap fuel.

Manufactures. Since the opening of the present century there have been wonderful developments in the manufacturing industries of Brazil, aided by heavy customs duties to keep out cheaper foreign products. Brazil is extremely poor in coal-supplies, but the rivers descending from the Brazilian plateau have in their courses falls that can be harnessed for the generation of electricity—'white coal'. At present only a small fraction of all this energy is being employed, mainly near Rio de Janeiro and Sao Paulo.

The making of textiles—cotton, silk, jute, and woollen cloths—is the chief manufacturing industry in the south-eastern cities. The production of sugar, alcohol, iron and steel, glass, paper, and leather are other industries that will

¹ Manganese is a metal that is added to steel for the production of a very hard variety, and is therefore one of the most valuable metals in modern industry.

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probably grow enormously when further electric power and more workers are available.

Rio de Janeiro (1,729,800), the capital and largest city of the United States of Brazil, stands on the southern shore of an almost landlocked harbour, 19 miles long and

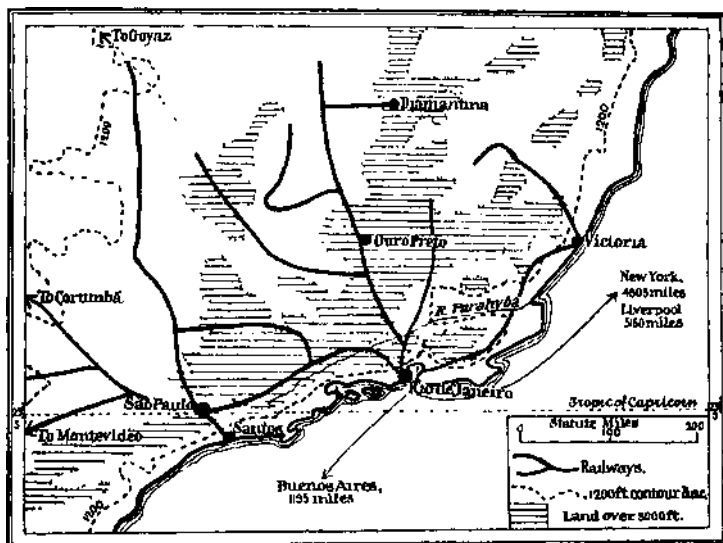


FIG. 40. POSITION OF RIO DE JANEIRO, SAO PAULO, AND SANTOS

Note the good railway-system and the important route of the Parahyba valley.
Only the principal railways are shown.

2 to 7 miles wide. This city, one of the most magnificent and imposing in the world, is built on a narrow coastal strip, backed by a mountain wall, on the slopes of which stand the residential suburbs. The wonderful island-studded harbour, big enough to hold the navies of the whole world, is dominated by two sharply rising peaks, the Sugar Loaf Mountain and Corcovado ('Hunchback'), while in the distance rise the fantastic shapes of the Organ Mountains, with the five 'Fingers of God'. Thanks to the

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refreshing south-east trades, Rio is one of the healthiest cities in the tropics.

Its central position on the developed and well-peopled coastal margins of Brazil has made Rio the great national

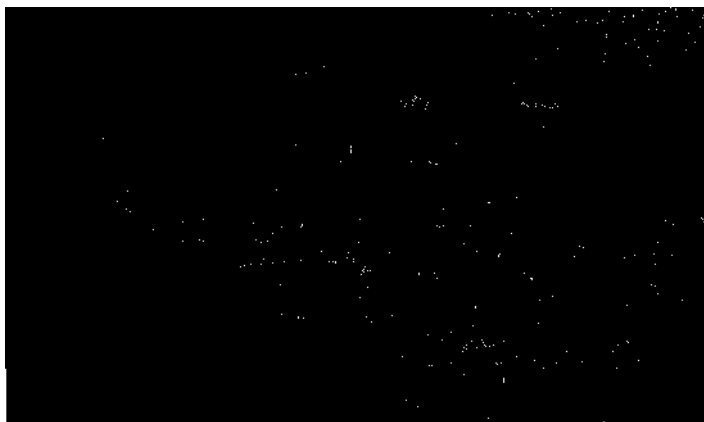


FIG. 41. RIO HARBOUR FROM CORCOVADO

Note the Sugar Loaf Mountain in the harbour and the mountainous nature of the coast.

Photo E.N.A.

centre of government, religion, learning, sport, and social life. As the chief importing centre of Brazil, it receives machinery, iron and steel, cotton goods, coal, etc., and redistributes many goods by coasting steamers to other parts of the country. Among a great variety of exports coffee is easily first.

Rio is an important manufacturing city, with textile mills, sugar-refineries, flour-mills, and other works. Rail-

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ways link it with other ports, or climb to the important plateau region behind it.

Sao Paulo, the second city of Brazil, has now nearly 1,000,000 inhabitants. Standing nearly 3000 feet above sea-level, it has a bracing, healthy climate, free from tropical heats. Sao Paulo is the great centre of the coffee trade,



FIG. 42. ONE OF RIO'S SPLEND'D SQUARES

The broad avenue on the right is the Avenida Rio Branco, the main artery of the city, over a mile long.

By courtesy of the "Manchester Guardian Commercial"

and in consequence is a city of industry and wealth, splendidly built and essentially modern in outlook and development. The heart of the city, with its banks, offices and hotels, is a district called the Triangle—the commercial hub of Brazil.

The people of Sao Paulo, largely descended from the hardy pioneers of early days, with a strong element of modern Italian blood, are noted for their vigour and enterprise, akin to the hustle of New York. Great industries—cotton, woollen, silk, jute sacks for coffee, leather, machinery, preparation of foodstuffs—thrive in Sao Paulo.

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Fine roads connect Sao Paulo with other parts of its state, and one, 300 miles long, enables motors to reach Rio de Janeiro in eight hours. Railways, too, radiate in all directions.

The chief railway and roads are those running 50 miles to Santos (114,000), the greatest coffee port in the world, with a splendidly equipped river harbour 3 miles from the open sea. The docks are greater in extent and importance



FIG. 43. PART OF THE INDUSTRIAL SECTION OF SAO PAULO CITY, THE GREAT CENTRE OF THE BRAZILIAN COFFEE TRADE

By courtesy of the "Manchester Guardian Commercial"

than those of Rio de Janeiro, and while the latter has the greater import trade, the volume of exports from Santos is usually two to three times that of Rio.

The railways bringing coffee to Sao Paulo are metre-gauge, but as the railways to Santos and Rio are broad-gauge (5 feet 6 inches), the coffee has to be transferred from one train to another. This drawback will no doubt be remedied.

Victoria (20,000), the capital of Espirito Santo ('Holy Spirit') State, is a smaller port standing on an island 400 miles north-east of Rio. Coffee, cacao, and manganese are exported.

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5. *The Southern Temperate Region.* Brazil has a considerable extent of territory stretching south beyond the Tropic of Capricorn, where the Brazilian highlands get gradually lower and narrower, finally disappearing in the country of Uruguay. The coastal plain is rather swampy, with lagoons and sandy soils in the south—not naturally a productive region. The rainfall is ample, and occurs at all seasons. In the northern half there is enough for forests, which include the fine Parana pine-trees; in the southern half the lighter rains result in grasslands. There are many German, Italian, Polish, and other Central European settlers.

The conditions are excellent for cattle, sheep, and horses, and immense herds are reared. Formerly the cattle flesh was of poor quality, fit only for salting or making 'xarque'—dried or 'jerked' beef—but in recent years the importation of foreign breeds has led to such an improvement that there is a big and growing export of chilled and frozen meat. Hides and wool are also important exports.

There has been great progress in agriculture also. Maize is still the chief crop, but wheat is increasingly grown, and may in time completely displace the large quantities imported by Brazil from Argentina. Rice, beans, and fruits (bananas, oranges, grapes) are other important food-crops.

The collection of yerba mate,¹ or Paraguay tea, has long been important, especially in the state of Parang. Paraguay tea is made from the leaves of a kind of small holly-tree, abundant in the forests of the Middle Parana basin. In the rest of Brazil, and in the northern part of South America in general, coffee is the common drink, but in the southern part of the continent Paraguay tea is the regular beverage. The leaves are picked, dried, and sent on pack-mules to special factories. Brazil has a big surplus for export (80,000 or 90,000 tons a year) to Argentina, Chile,

¹ *Yerba* (Spanish) = 'herb.' *Mate* (pronounced 'ma'-te') is from the native Indian name given to the gourd from which the tea was drunk. The Portuguese (and so Brazilian) name for the tea is *herva matte*.

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and Uruguay. The industry is so important that plantations have been established.

The timber-supplies of South Brazil are very valuable, especially the Parana pine. Before the War Brazil imported huge quantities of soft timbers from North America, but to-day she is an exporter of such timbers, her chief customer being Argentina.

The coal seams of Sao Paulo State are continued in South Brazil. The seams are poor and thin, the coal containing much moisture and ash. It can be used for making gas, or, in the form of pulverized coal, as fuel in special furnaces. At present, however, the coal is quite unimportant, and big quantities are imported.

Parana is the chief port of Parana State, and exports Paraguayan tea and coffee.

The large state of Rio Grande do Sul has its chief ports on the long, rather shallow, fresh-water Patos Lagoon. Porto Alegre (180,000), the state capital and chief commercial centre, and Pelotas (40,000) cannot be reached by large vessels, so that the chief port is Rio Grande do Sul (60,000), near the entrance to the lagoon, and accessible to ocean-going steamers. It is the chief centre and port for the cattle and meat industries.

EXERCISES

1. Compare the geographical conditions and human activities of the Amazon lowlands with those of the Andean plateaux.

2. Draw a large map to show the natural regions of Brazil, and on it indicate the chief products of each region and the ports. By means of arrows show how the products reach the ports.

3. Draw sketch-maps to show the position and importance of (a) Rio de Janeiro, (b) Sao Paulo and Santos, (c) Pernambuco and Bahia, (d) Para. Add brief notes on any important points not shown in the maps.

4. The density of population per square mile for the whole of Brazil (1920 census) was 9.3. Some of the states had densities as follows: Amazonas (0.5), Para (2.2), Goyaz (1.9), Matto Grosso (0.4), Pernambuco (43.4), Bahia (20.2), Minas Geraes (26.5), Sao

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Paulo (40.9), Rio de Janeiro (58.5), Rio Grande do Sui (22.6). Comment upon these figures, and explain the differences you observe.

5. Brazilian exports in 1928 amounted (in millions of pounds sterling) to £97.4. The chief items were coffee (£69.7), hides and skins (£6.7), cacao (£3.6), yerba mate (£2.8), frozen and chilled meat (£2), tobacco (£1.6), rubber (£1.4), cotton (£0.8), sugar (£0.5). The imports (in millions of pounds sterling) amounted to £90.6. The chief items were iron and steel, machinery, etc. (£18.7), wheat (£7.8), cotton goods (£5.6), motor-cars (£5.5), coal and coke (£3.1), beverages (£1.6). Represent these figures diagrammatically, and add brief notes on their significance.

CHAPTER IX

PARAGUAY AND URUGUAY

IN this chapter we shall study two countries that are alike in being small in area and composed largely of lowlands, but in other respects are rather sharply contrasted.

PARAGUAY

Paraguay is one of the two South American countries that lie wholly inland, possessing no seaboard. The chief part of Paraguay lies between the rivers Paraná and Paraguay, flanked by two great neighbours, Brazil and Argentina. This region, known as Paraguay Proper, has an area of 61,600 square miles—a little larger than England and Wales. Between the river Paraguay and its long Andean tributary the Pilcomayo there is a great tongue of land of even greater size (about 100,000 square miles), over most of which Paraguay has long disputed ownership with Bolivia. In recent years the two countries have been on the brink of war, but fortunately the timely intervention of the Pan-American Union—a kind of American League of Nations—has led to attempts to settle the boundary question by peaceful means. Paraguay has in the past suffered probably more than any other South American country from the devastating effects of wars and revolutions.

The population is only a little over 800,000 (about the size of Liverpool), and consists of mixed Indian (the chief element) and Spanish blood, with about 30,000 pure Indians in the western or Chaco region. The population is so small and the country so impoverished that progress is sorely hampered by lack of suitable labour and abundant

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capital. There are signs of coming development, however, among them being the introduction of modern farming machinery and United States capital.

Paraguay has been handicapped by poor communications. Good roads are practically non-existent. The Paraguay river is the most important waterway, although steamers take about five days to go from Asuncion to Buenos Aires. The map makes it clear that the development of Paraguay is closely bound up with Argentina and Uruguay, through which Paraguayan trade must pass until railways have been constructed to the Brazilian ports. Indeed, the most important means of communication at present are the 230 miles of railway from Asuncion to Encarnacion, a small town on the Parana river, opposite Posadas, a railway terminus of the Argentine. The two towns are connected by a train-ferry, so that the through journey to Buenos Aires (935 miles from Asuncion) may be accomplished in less than two and a half days.

Two natural regions may be distinguished in Paraguay: Eastern Paraguay and Western Paraguay, or the Chaco region.

1. *Eastern Paraguay.* Eastern Paraguay is a plain lying between the Parana and Paraguay rivers, crossed by a long, southward-projecting ridge of the Brazilian highlands, forming the watershed between the tributaries of the two great rivers. Only the northern part of the region is within the tropics, and the climate is hot only for about three months, the rest of the year being spring-like; at times frosts occur. The rainfall comes in all seasons, but most in summer, and decreases southward. Thus most of the region is rather densely forested, while there are grasslands in the south.

The chief occupations are farming and the collection of forest products. Of the exports, which go almost entirely to or through Argentina, 35 per cent, are animal products, 25 per cent, agricultural products, and the remainder (40 per cent.) forest products.

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The well-watered pastures of the plains support about 5,000,000 cattle, and cattle-rearing has always been important in Paraguay. Bulls of certain first-class British types have been introduced to improve the breed of the home stocks. With the aid of capital from the United States factories have been built for dealing with the animal products, the most valuable of which is meat extract. Tallow, 'jerked' beef, canned meat, and hides are also exported.

Of the cultivated crops the most important are tobacco, exported to Holland, Switzerland, Germany, and Argentina; cotton, grown with increasing success, and likely to become more important when more labour is available; and oranges, of excellent quality, the number exported being twice that from Brazil. The export of oranges has increased since the Argentine exporters insisted upon the wrapping of the fruit in paper and its packing into crates.

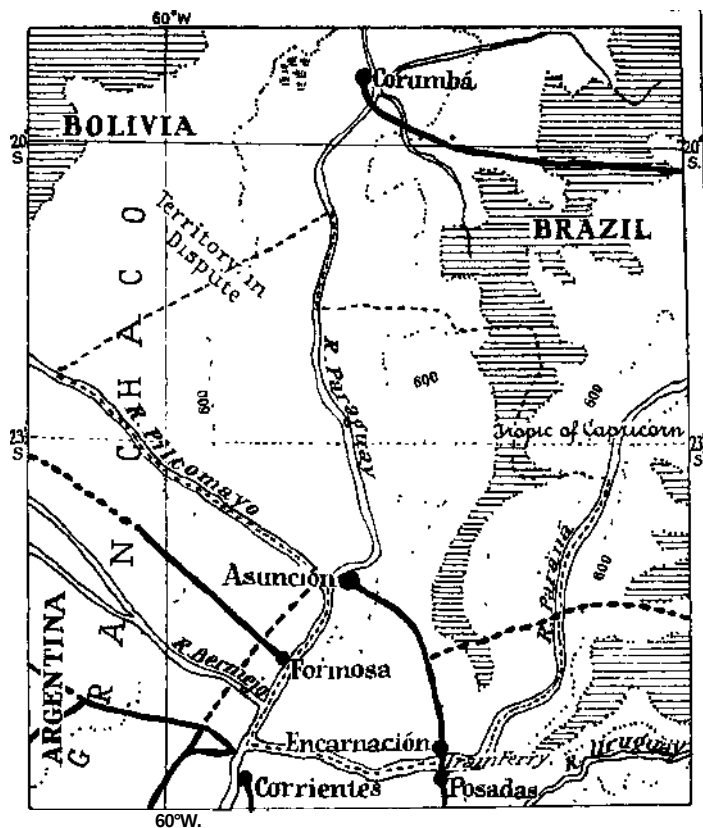
Rice, maize, and sugar are grown for the home market.

Yerba-trees grow wild in the forests of North-east Paraguay, and the gathering, drying, and transport of the leaves and twigs has long been an important industry. The trees are found in an area as big as Scotland, but owing to reckless picking the supplies have been depleted, and plantations are being established on a large scale. About two-thirds of the Paraguay tea produced is exported.

The immense timber resources are almost untouched, except for the export of sleepers for the Argentine railways.

Asuncion (142,500), the capital of Paraguay, stands on the left bank of the Paraguay river, near the confluence with the Pilcomayo. River-steamers run to Montevideo (Uruguay) or Buenos Aires (Argentina), where merchandise can be transferred to or from ocean-going vessels. The city, despite its modern buildings, saw-mills, cigarette-factories, football clubs, and harbour works, is still mainly Spanish in type.

2, *Western Paraguay.* Western Paraguay, between the Paraguay and Pilcomayo rivers, forms part of El Gran



Land over 1200 ft.

• Railways.

- Boundaries.

• Projected railways.

0 50 100 150 200
Statute Miles

FIG. 44. PARAGUAY: RELIEF, COMMUNICATIONS, AND CHIEF TOWNS

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Chaco ('the Great Hunting-ground'), a region of forests and swamps, with a big proportion of good grasslands. Cattle-rearing and the cultivation of cotton and other crops are occupations at present in their infancy.

The most important product is the quebracho-tree ('break-axe' tree), a hardwood that will not float in water. This tree provides excellent durable timber for building purposes and railway-sleepers, but is most valued for the large supplies of tannin (employed mainly in leather-tanning) contained in the heartwood. Thousands of trees are cut down and taken to factories to be broken up, and, as the trees grow slowly, the forests are being depleted, and the export of tannin is steadily declining.

The future development of this portion of Paraguay is dependent on better transport facilities, a bigger population, and a permanent settlement of boundaries.

URUGUAY

With an area of 72,153 square miles (much less than that of Great Britain), Uruguay is the smallest of the South American republics. Like the others, it has had a turbulent history. Wars, especially with its great northern neighbour, Brazil, and revolutions have been all too frequent. For over a quarter of a century, however, the peaceful development of the country has been uninterrupted, and its prosperity is increasing. Although the population—mainly of Spanish origin—is twice that of Paraguay, the number is only a little over 1,800,000.

Uruguay, lying on the northern shores of Rio de la Plata, consists of the southern extremities of the Brazilian highlands, but on the whole is a region of undulating plains, none of the rocky ridges reaching as much as 2000 feet above sea-level. The climate is one of the finest and healthiest in the world, largely owing to exposure to the Atlantic, which ensures freedom from extremes of heat and cold. The annual rainfall is about 40 inches, and is fairly

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evenly distributed throughout the year. There are many streams, generally bordered by woodlands, but Uruguay as a whole is a grassland region, the rich black soil of the plains producing grasses superior even to those of Argentina.

Practically the whole of Uruguay is suited to agriculture—the growing of crops—but it is also excellently fitted for



¹ FIG. 45. URUGUAY AND ITS PRINCIPAL RAILWAYS AND TOWNS

grazing purposes. Indeed, no other country in the world is so largely devoted to the rearing of animals. Almost the whole country is given up to grazing, the land being divided up into exceedingly large estates (*estancias*), owned by wealthy *estancieros*. The superintendents or managers are usually men of great skill, receiving large salaries, and often British or North American by birth. The labourers or peons live in small houses, and are provided with food from the *estancia*, mutton being the staple diet.

The only disadvantages in the farming industries of Uruguay are occasional droughts and swarms of locusts

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that come from the north at irregular periods and settle over the land, consuming leaves, fruits, and even grasses.

Livestock is the main wealth of Uruguay, which possesses over 8,000,000 cattle, over 14,000,000 sheep, 500,000 horses, and 250,000 pigs. The cattle and sheep belong almost entirely to British breeds. Great precautions are taken to prevent the outbreak or spread of animal diseases.

Live cattle, sheep, and horses are exported, and animal products compose the great bulk of the exports. Frozen, chilled, canned, and 'jerked' beef, beef-extract, frozen mutton, wool, fats, hides, etc., are exported in big quantities, chiefly to Great Britain, Germany, France, and the United States.

Agriculture is of much less importance than animal-rearing, and a larger population is essential before greater progress can be expected. Wheat is the chief crop grown and exported, followed by linseed¹ and maize.

Fruits of many kinds—oranges, lemons, pears, peaches, grapes, apples—grow^r to perfection, and there is a small but increasing export of fresh fruit, especially oranges.

The mineral wealth of Uruguay, including gold, manganese, and coal, is very little worked, and supplies of coal, oil, and firewood are all imported.

The chief industries of Uruguay are naturally connected with animals. There are four *frigorificos*, or freezing-works, and several *saladeros* (salting-works) for producing 'jerked' beef. The manufacture of cottons, glass, leather, wines, chemicals, etc., is only carried on in a very small way, and most of the country's needs are imported from the United States, Great Britain, Germany, and the Argentine.

The transport facilities of Uruguay are excellent. Railways, principally in the hands of British companies, con-

¹ Linseed is the seed of the flax plant, the fibre of which is made into linen cloth. Linseed is crushed to obtain the valuable linseed oil, used in the manufacture of paints and varnishes, the waste remainder being used as oil-cake for feeding cattle.

PARAGUAY AND URUGUAY

verge upon Montevideo from all parts, and a network of splendid motor-roadways is also being constructed. The chief inland navigation is on the Uruguay river, which forms the western boundary of the state, and is navigable as far as Salto ('Leap' or 'Fall'), where there are rapids.

Montevideo (460,000), the capital of Uruguay, is a clean, bright city of flat-roofed houses, built on the shores of a fine bay and round the base of the Cerro, the isolated conical hill to which the city owes its name. Montevideo is the centre of commerce, railways, roads, and government, and the only town of any size in the country. Through its harbour passes the huge bulk of products from the slaughter-houses, freezing-works, packing-sheds, and other factories of its hinterland.

Paysandu (26,000), the second town in order of importance, Salto (30,000), and Fray Bentos (7400) are river-ports on the east bank of the Uruguay river, and important centres of the meat-packing and frozen-meat industries.

EXERCISES

1. Compare and contrast Paraguay and Uruguay with regard to their geographical conditions and present state of commercial development. Add simple sketch-maps.

2. Draw sketch-maps to show the importance of (a) Asunción, indicating its connexion with the coast, and (b) Montevideo.

CHAPTER X

ARGENTINA AND THE FALKLAND ISLANDS

EARLY Spanish explorers reached the Rio de la Plata, and the coasts of Argentina were explored by Magellan, but the first European to penetrate the country was Sebastian Cabot, who was entrusted by Spain with the formation of a settlement in 1526. The Parana and Paraguay rivers were at first valued as a highway to the silver-mines of Peru; indeed, Cabot obtained silver ornaments from certain natives. Hence the great estuary was called Rio de la Plata ('Silver River'). Later, when the various provinces were united into one great republic, the name Argentina ('Silver Land') was adopted.

By 1816 the Rio de la Plata provinces had completed their struggle with Spain for independence, and in 1825 the republic of Argentina was established. For over sixty years Argentina was troubled with periodical wars and rebellions, but the wisdom of her people is revealed in the peaceful settlement of all disputes with other countries during the last fifty years. A treaty of friendship, commerce, and navigation between Argentina and Great Britain was signed as long ago as 1825, and since that date trade between the two countries has steadily expanded. The interest of Great Britain in Argentina is revealed by the £600,000,000 of British capital invested in Argentina (rather more than half in railways), as compared with £85,000,000 of French and £70,000,000 of United States capital.

In our actual trade with Argentina the balance is heavily against us, for we import commodities—meat, wheat, maize, wool, etc.—to the value of over £81,000,000 a year,

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and in return supply only about £36,000,000 worth of goods—textiles, coal, iron, and steel, etc. It will be realized that Argentina has a greater volume of trade with Great Britain than with any other country, although recently the United States has made substantial gains in Argentine trade.

Undoubtedly Argentina is destined to become one of the greatest countries in the world. In area alone (1,153,119 square miles) it is almost one-third the size of Europe, or over nine times as large as the British Isles. The northern and eastern boundaries of Argentina are marked by rivers—Pilcomayo, Paraguay, Parand, Uruguay—which, being generally trade highways, tend to bring together peoples on opposite banks. On the west, however, the 2980-mile boundary with Chile is the formidable Andes, excellent for keeping peoples apart, but hindering freedom in trade and travel.

The population of Argentina is nearly 12,000,000, but as most of the people live in the provinces adjoining the Parana and Rio de la Plata huge areas of the country are practically unpeopled. The great extent in latitude, 22° S. to 55° S., almost wholly in the temperate zone, is an indication of the wide range of commodities that can be produced and the huge population that might be supported. Argentina is the most progressive country in South America, and has the advantage over Brazil and the northern republics of - being a true white man's land, where Europeans can settle and work in comfort and prosperity. Hence 73 per cent, of the population are Argentine-born and of European descent, and another 23 per cent, are foreign-born and almost wholly of European stock. There are 50,000 people of British descent in the whole country.

The Government of Argentina has long welcomed farmers, labourers, and other workers seeking to settle in the country, and great numbers of immigrants arrive every year. In 1927, for example, 165,540 men entered Argentina, chiefly from Italy, Spain, and Poland, and since 1857

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nearly 6,000,000 have arrived, of whom about 2,400,000 remain. Large numbers who come for harvest work do not remain as permanent settlers. As in Brazil, the greatest in numbers and success among the modern settlers are the Northern Italians. In recent years there has been a steady decline in the number of immigrants from Europe, the chief reason being the increasing difficulty of buying small farms cheaply. The great obstacle is that so much of the best farming country is still held as enormous estates by a mere handful of men who will allow settlers to rent land for only a short period. Attempts have been made—so far without success—to introduce laws compelling such land-owners to allow their estates to be split up and sold as small farms.

Argentina consists of three relief regions: (1) the vast plains—the fertile bed of an ancient sea—drained to the Rio de la Plata, and including the pampas, part of El Gran Chaco, and the 'Mesopotamian' region between the Parana and Uruguay rivers; (2) the low plateau of Patagonia, continued beyond Magellan's Strait in Eastern Tierra del Fuego; (3) the eastern slopes and foothills of the Andes.

The annual rainfall map indicates that the rainfall diminishes from north-east to south-west. Thus if we take climate into account we may divide Argentina into four natural regions: (1) the north-eastern forests, (2) the dry north-west, (3) Patagonia, and (4) the grasslands.

1. *The North-eastern Forests*, This region consists of the three national territories¹ of Formosa, El Chaco, and Misiones. It is a huge, flat plain of fertile soils, broken only in the east by a long, low ridge projecting from the Brazilian highlands. Climate and vegetation resemble those of Eastern Paraguay. Summer is the wettest season, and the

¹ Fourteen divisions of Argentina are provinces, with a full measure of self-government; the ten national territories are areas of small population, governed directly by the President and Federal Government.

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developed part of Argentina, owing to the great difficulties to be overcome. It is remote from ports and hard to reach. The Indian tribes, though small in numbers, are fiercely hostile and difficult to subdue. Penetration is slow and arduous, for the rivers flood wide areas in summer and almost disappear in the dry season, thus being of little use for navigation. Plagues of locusts and other insects add still further to the trials of the settler. Pack-mules and bullock-wagons are the chief means of transport.

Of the many valuable trees abundant in the forests, only one is at present important in trade: the quebracho. Argentina has about nineteen-twentieths of the total reserves of quebracho in South America, and the felling of the trees for railway-sleepers, constructional work like wharf piles, and the extraction of tannin is the leading occupation over a wide area. Many logs are taken by light railways to factories set up in the forests for the purpose of breaking up the heartwood to obtain tannin. As in Paraguay, the trees are being destroyed, and no attempt has been made to grow others for future supplies.

Yerba mate is an important product of Misiones, the most easterly part of the region, where plantations were first set up by the early Jesuit missionaries. Of the 90,000 tons consumed annually in Argentina, 20,000 tons come from Misiones, the remainder being imported from Brazil and Paraguay.

Cotton, recently introduced in the Chaco Territory, has proved a most successful crop, and although the annual production is only a little over 100,000 bales, there is a surplus for export, mainly to Liverpool for the Lancashire mills. More labourers and better transport facilities will ultimately make Argentina one of the greatest cotton-growers in the world, so extensive is the area of suitable land available.

The rearing of cattle and the growing of tobacco, sugar, and other crops are other occupations worthy of mention. The only town of importance is the river-port of Posadas

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(16,000), on the Parand, whence the train-ferry crosses on the route to Asuncion. Posadas is the capital of Misiones Territory and the centre of the yerba mate industry.

2. *The Dry North-west.* Immediately east of the Andes, and merging into the Chaco and pampas farther east, there is a long extent of territory stretching as far south as the Rio Colorado. From the plains on the eastern side the land rises in mountainous ridges, separated by deep valleys, toward the Andes.

The outstanding characteristic of the region is its dryness. The annual rainfall is less than 16 inches, and comes almost entirely in summer, when the heat causes excessive evaporation. Thus, even apart from the prolonged droughts that occur periodically, the land as a whole is arid. Many rivers come down from the well-watered Andes, but most disappear in the dry lands below, and only two or three flow permanently right across the region. The check in the flow of the streams on reaching the foot of the Andes causes them to build up fertile alluvial fans—like inland deltas—on which settlements may be found, as at Mendoza.

The natural vegetation varies in accordance with the rainfall. The wetter parts, especially along the river-banks, support woodlands, the timber being of great value for building and as fuel. Other areas have coarse grasses or thorny scrub and desert plants.

An old and still important occupation is the rearing of cattle, horses, and mules, which feed upon the natural pastures and the lucerne or alfalfa (a kind of very long-rooted^x clover that can thrive in rather dry regions) grown in the valley bottoms. The skins of goats fed on the mountain pastures are exported.

The pastoral industry has flourished for several centuries owing to the demands of the Andean mining regions for flesh food and beasts of burden. Cattle are still sent over the mountains to the nitrate fields of Northern Chile

¹ Alfalfa has been known to strike its roots to a depth of over 60 feet.

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or northward to the mining lands of the Bolivian plateau, but the modern tendency is for the animals to go eastward to the slaughter-houses and packing-sheds of Buenos Aires.

Agriculture in this dry region is clearly dependent upon irrigation, and settlements occur where mountain streams

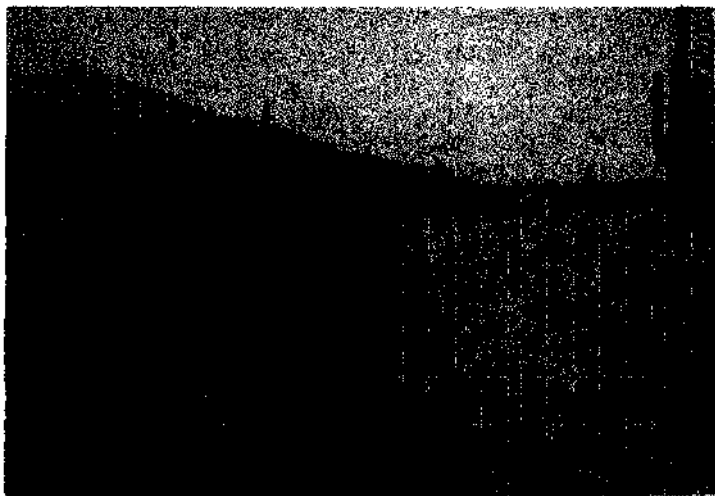


FIG. 47 A TYPICAL LANDSCAPE IN THE DRY NORTH-WEST OF ARGENTINA

Note the bare nature of the landscape, the drought-resisting cacti, and the irrigation canal that will bring water to the thirsty land.

By courtesy of the Argentine Consul

are available. In temperature (but not in rainfall) conditions the region resembles the Mediterranean lands, and, with irrigation, crops typical of Mediterranean regions can be produced. Besides alfalfa—grown for fodder—maize, wheat, and tobacco are grown for local needs. Three other products—sugar, wine, and fruit—are important in trade.

The sugar-cane is mainly grown in the north, around Tucumdn, and amounts to over three-quarters of the total Argentine crop. The whole of the sugar is consumed in

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tina, south of the Rio Colorado, consists of the irregular plateau of Patagonia, with a general slope eastward to the Atlantic. Parts of the surface are shingle or bare rock; others have a covering of soils and rock materials brought down from the Andes by rivers and glaciers.



FIG. 49. LAKE NAHUEL HUAPI, IN THE ANDES OF PATAGONIA

This region has been glaciated, and somewhat resembles a reproduction on a grand scale of the English Lake District.

By courtesy of the Argentine Consul

Patagonia lies in the belt of constant westerlies, and, being on the leeward side, receives them as very strong, dry winds blowing down from the Andes. These powerful west winds are one of the dominant features of the region. Not only do they carve upstanding rocks by hurling sand and dust against them, and also fill in hollows; but they make it impossible to tread or exist in the exposed parts. Although windy and cold the climate is healthy.

The lower slopes and valleys of the Andes are well

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watered, and are thus covered with fine forests of cypresses, cedars, and beech-trees. There are many lakes in the Andean zone. On the Patagonian plateau itself, however, the rainfall is extremely low (under 10 inches a year), so that many parts are virtually desert, and only in the river valleys are there pastures of any value. Some of the rivers—the Negro and the Chubut, for example—have carved out deep, trench-like valleys in the dry plateau.

Sheep and a few cattle are kept on the coarse grasses in some areas, but adequate water-supply is a grave difficulty. The most productive belts are the valleys of the Negro and the Chubut, where, in spite of liability to floods and droughts, big crops of alfalfa and also wheat, vines, and fruits can be grown, and the pastures are good enough to support large numbers of sheep and some cattle and horses. Over 12,000,000 sheep constitute the chief wealth of Patagonia, and to the early export of wool has recently been added that of frozen mutton, owing to the setting up of freezing-works at the ports. There are over 400,000 cattle, and about the same number of horses and goats.

Patagonia has only a small population (less than 150,000), and it attracts few emigrants from Europe. The country is being opened up by railways, and the Government has constructed a big dam for increased irrigation in the Negro valley. The population is very mixed, including Spaniards, Chileans, Italians, British, Russians, and Boers. The native Patagonian Indians, probably the tallest race in the world, are very small in numbers. They secure all their needs of food, clothing, and shelter by hunting two wild creatures, the guanaco, a species of wild llama, and the rhea, or South American ostrich.

One of the most promising developments in Patagonia is the increasing output of petroleum from the coast of the Gulf of St George. Operations are mainly controlled by the Government, and almost the whole Argentine production of oil is from this one source. Oil is being used more and more as fuel on the railways.

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which radiate long lines of galvanized iron troughs. The large house of the manager stands near the centre of the ranch or 'camp,' and near by are the tiny dwellings of the gauchos and the corral—the enclosure in which the cattle are branded or collected for sale.

The natural pastures near the Atlantic are of good quality, but the coarse tufted grasses of the drier inland regions are incapable of supporting anything like the same density of animals. But the extensive planting of alfalfa has greatly increased the carrying capacity of the drier regions, and to-day one-third of all the cultivated land in Argentina is under alfalfa, supporting an animal population of about 90,000,000, chiefly cattle, sheep, and horses. The alfalfa is either used for grazing in the field or is cut for hay. The crop may be cut five, six, or even ten times a year; although it does not enter directly into the export returns, it forms the basis of the great animal-rearing industry.

Argentina has about 37,000,000 cattle, probably as many as the country can support without more intensive cultivation of pastures, nearly half the number being in the one province of Buenos Aires.

Before the days of the refrigerator wool, skins, and tallow were the chief exports from the sheep-rearing industry, salt and dried meat being of less importance. About 1880 the exportation of frozen mutton began. The merino sheep, previously kept for their wool, began to give place to Lincoln and cross-bred sheep supplying superior mutton. By 1900 the number of sheep on the pampas reached a maximum. Since then the number has declined, partly because sheep graze alfalfa—the chief fodder plant—so close as to kill it; there are now fewer sheep than cattle. In 1914 there were 43,230,000 sheep, in 1923, 30,672,000.

The Rio de la Plata *frigoríficos* purchase cattle and sheep for slaughter, the works being capable of dealing with 25,000 oxen or 60,000 sheep a day. The meat is exported in various forms, of which chilled beef is the great speciality

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of Argentina. The carcasses, divided into four quarters, are wrapped up in stockinet and then in sackcloth. They are put on hooks in the cool chambers of the meat boat and kept at a temperature of 29⁰ or 30⁰ F. throughout the voyage. The meat arrives in a soft condition, ready for immediate consumption. The United Kingdom takes almost the whole of the chilled beef export.

Frozen beef is carried at a much lower temperature, and has to be thawed before it can be used. It is not much in favour in Great Britain, and most of the export is to Continental Europe. Most of the frozen mutton, however, is consumed in Great Britain.

Argentina supplies at least two-thirds of the world's export of chilled and frozen meat. The following are the average annual figures for the years 1926, 1927, 1928:

Chilled beef	463 034 tons
Frozen beef	141,438 ,,
Frozen mutton and lamb	62,502 ,,

The livestock industry provides many other important exports, such as canned meat and tongues. Meat extract is manufactured by world-famous British firms, Liebig's Extract of Meat Company and the Argentine Estates of Bovril, Ltd. Argentina is one of the chief sources of hides, and ranks second to Australia as an exporter of wool, most of which goes to the continent of Europe. The horses of Argentina, numbering nearly 10,000,000, are valuable draught or riding animals. Large numbers of them were employed in the British armies during the South African and World Wars. Pigs, mules, and asses are also reared in big numbers.

In recent years dairy-farming has rapidly grown in importance, owing to the suitability *of the pastures in the east of Buenos Aires Province and the introduction of improved dairy cattle and the most modern creamery equipment. Butter of first-class quality is made for the home market and for export,, almost wholly to England.

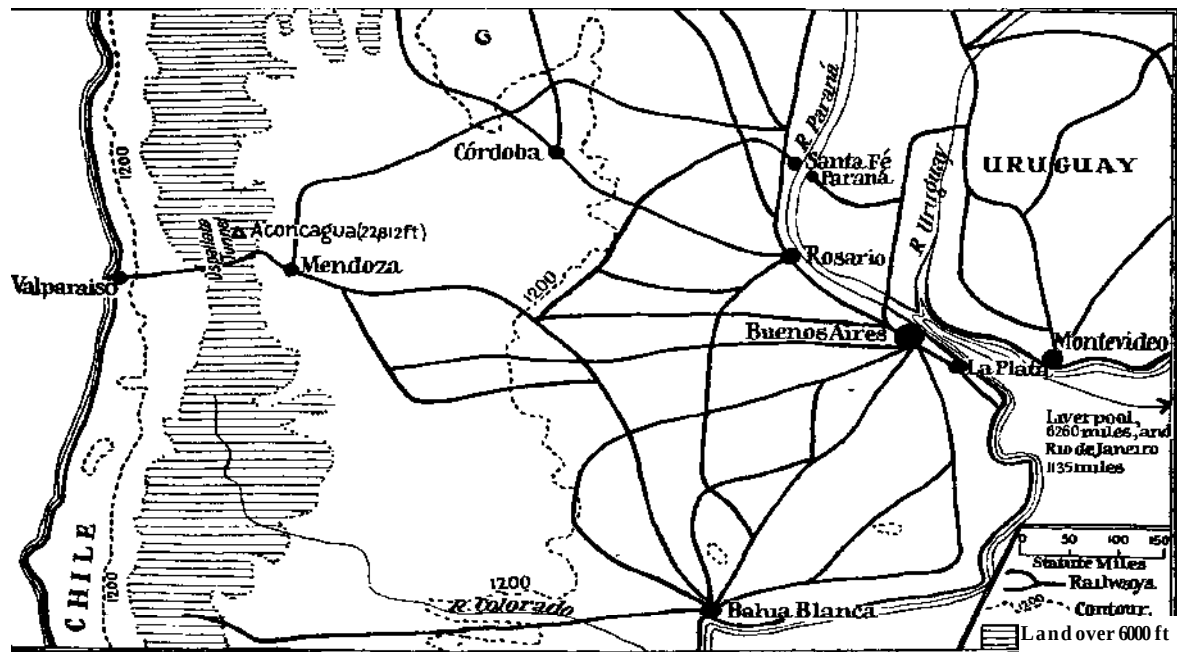


FIG. 52. THE POSITION OF BUENOS AIRES, ROSARIO, ETC.

Note the intricate network of railways across the level pampas and the transcontinental railway to Valparaíso.
Only the principal lines are shown.

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matter, and an intricate network spreads out fanwise from Buenos Aires. The only weak links in this admirable chain of transport—easily the best in South America—are the absence of roads from districts lying away from the railways and the employment of three different rail-gauges. Much of the railway development is due to British enter-

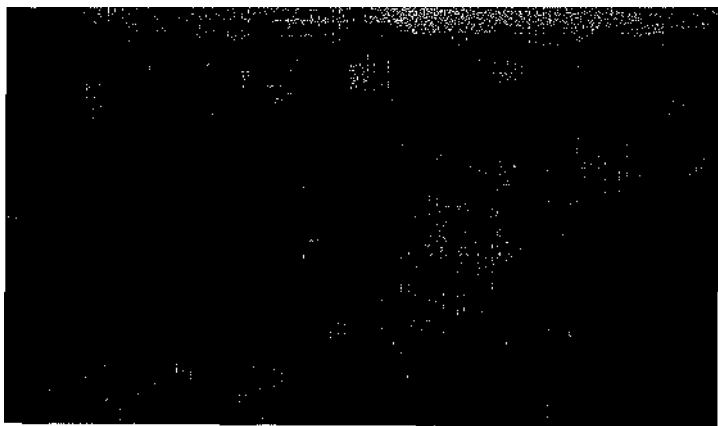


FIG. 53. LOOKING ACROSS BUENOS AIRES TOWARD THE HARBOUR
ON Rio DE LA PLATA

Note the narrow entrance to the deep-water harbour, from which
the docks can be entered.

By courtesy of the Royal Mail Line

prise. Road-construction is handicapped by scarcity of road metal and difficulty of securing labour.

The leading manufacturing industries of the grassland region are naturally those dependent on the raw materials available. Thus meat-packing, flour-milling, oil-seed crushing, tanning, and brewing employ many workers. The making of textiles, chemicals, iron and steel goods, etc., is increasing in and near Buenos Aires.

Buenos Aires, the capital and greatest port of Argentina, has a population of 2,000,000. It is thus the largest city

THE FALKLAND ISLANDS

Santa F6 (60,000) lies farther up the Parand river than Rosario, but the deepening of the channel has made it accessible to ocean-going steamers. As the centre of an exceptionally fertile region, it rivals Rosario as a river-port. The chief exports are grain, especially maize, and quebracho.

Bahia Blanca (50,800) has grown rapidly as the southern outlet of the pampas. Its well-equipped port handles increasing quantities of grain in its giant elevators. Wool is also an important export, and there are freezing-works for the meat trade.

THE FALKLAND ISLANDS

The Falkland Islands are a group of small islands lying about 300 miles east of the entrance to the Strait of Magellan, in the corresponding latitude to London. Two of the islands, West Falkland and East Falkland, are much larger than the others. The two main islands are hilly, rising to over 2000 feet; they have been glaciated, and possess fiord coasts, thus resembling Western Tierra del Fuego. The islands are swept by the strong Roaring Forties, which make it impossible for trees to grow, SQ that timber for building purposes has to be imported. The climate is cooler and slightly wetter than that of Southern England.

The Falklands have hilly pastures, rocky moorlands, and extensive areas of peat. Sheep-farming is the all-important industry, over 600,000 sheep supplying wool and a little mutton for export to London. Small quantities of oats and potatoes are the only crops possible on the poor soils. Travel is by sea or on horseback; there are no roads.

The population of about 2300 is almost wholly of pure British descent, for the islands have been under the British flag since 1832, although Argentina refuses to recognize our claim and presents a protest against it every year.

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Stanley (950), on the east coast of East Falkland, is the chief port and only town, strikingly like a fishing town of the Scottish Highlands. In 1914 Stanley Harbour served as a base for successful naval action against a small German squadron operating in South American waters.

The British dependencies of South Georgia, South

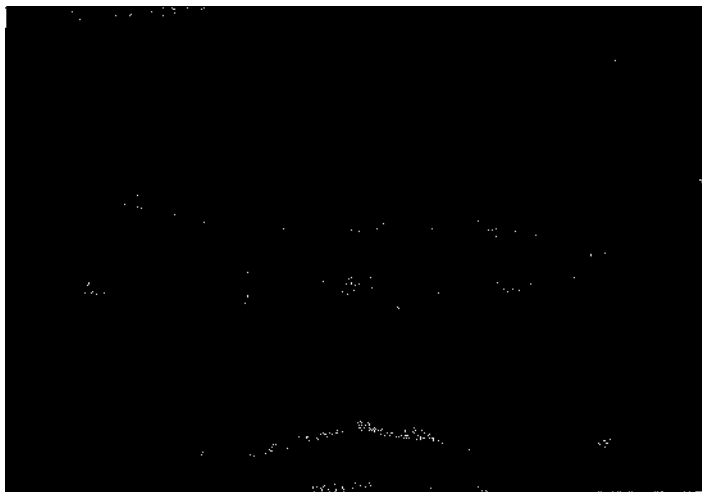


FIG 55. WHALING FACTORY, PRINCE OLAF HARBOUR,
SOUTH GEORGIA

[Observe the bleak, barren slopes.

By courtesy of the Secretary of the Imperial Institute

Shetlands, South Orkneys,¹ and South Sandwich Islands lie south-east or south of the Falklands. They are glaciated and mainly barren, but serve as bases for whaling fleets, the whalers being chiefly Norwegians. Whale oil and whale guano are exported. The area of these dependencies of the Falkland Islands contains a sector of the Antarctic continent, being defined to include all islands and territories between longitude 20° and 50° W. south

¹ Argentina also claims the South Orkneys.

ARGENTINA AND THE FALKLANDS

of latitude 50° S. and between longitude 50° and 80° W.
south of latitude 58° S.

EXERCISES

1. Write an essay on the modern development of Argentina.
2. Contrast the pampas with the selvas in position, climate, transport, and economic development.
3. Show the following figures diagrammatically, adding brief notes on their significance. (All figures are in millions of pounds sterling) Argentine exports (1928) total £205.9, being chiefly grain, flour, and linseed (£127.9), animal products (£68.5), forest products £44.9). Argentine imports (1928) total £180.9, being chiefly textiles (£34*4), iron and steel, implements, machines, etc. (^33'2), oils and chemicals (^30-5), food, tobacco, and drink (£16-3), glassware and crockery (£6-7), paper (£6).
4. Draw a sketch-map to show the chief ports of the pampas, and indicate the products that reach them for export from their hinterland.
5. Indicate clearly the position and importance of (a) Mendoza. (b) C6rdoba, (c) Rosario.

CHAPTER XI

CHILE

THE most striking feature about the republic of Chile is the great length of the country as compared with its breadth. The coastline measures 2800 miles—more than half the Pacific coast of South America—and the average width is only 100 miles.

The colonization of Chile began in 1536, and Santiago City was founded in 1541 by Pedro de Valdivia. But the native Araucanians, hardy mountaineers, offered a stern resistance that the Spaniards found difficult, if not, indeed, impossible, to overcome, and peace was not finally established until 1773. Chile began her struggle for independence by a declaration of war against Spain in 1810, a peace treaty satisfactory to Chile being concluded in 1826. Of the various revolutions and wars that occurred during the nineteenth century the one that had most important results was the Pacific or Nitrate War, in which Chile fought Peru and Bolivia. The consequences of this struggle have already been explained in connexion with Peru and Bolivia.

Lying between the Pacific and the Andes, and bordered by Peru, Bolivia, and Argentina, Chile has an area of almost 290,000 square miles and a population of 4,360,000. The mass of the people are mestizos of Spanish and Indian descent. Of the remainder, the chief elements are European—Spanish, Italian, German, French, British, Austrian—and peoples of other South American states—Bolivians, Peruvians, and Argentines. About 100,000 pure native Araucanians, of splendid physique, live in a district north of Valdivia.

CHILE

Chilean trade has developed a great deal during the last twenty years, her exports having doubled in value, while her imports have increased only about one-quarter. Much of this development has been accomplished with the aid of British and United States capital, the sums invested (1929) amounting to £97,000,000 and £69,000,000 respectively. These two countries also share between them most of the Chilean trade. Each supplies Chile with about one-quarter of her imports, while the United States take over 40 per cent, and Great Britain over 30 per cent, of Chilean exports.

Manufacturing industries have greatly increased in Chile since 1914, in connexion with raw materials produced in the country; wool, cotton, silk, leather, wood, sodium nitrate. Only scarcity of skilled labour prevents still more rapid industrial development.

For obvious reasons sea-transport has always played a big part in the communications of Chile. The Chilean State Longitudinal Railway, built mainly for strategic reasons and run at a loss, extends nearly 2000 miles from north to south, and has branch lines of 1200 miles. In addition, other railways total over 2400 miles. A big defect in the railways is the multiplicity of gauges, owing to the making of so many isolated private lines inland from ports. Even the State railway has two different gauges. Two new railways of importance are projected: (1) from Antofagasta to Salta, to provide a route for produce from North-western Argentina; (2) from a point between Concepcion and Valdivia to an Argentine line from Bahia Blanca, by which Chile may export her coal and timber. On the whole, however, railway extensions now receive less attention than road developments. Over 30,000 miles of roadway have been made or are nearing completion, and new roads and bridges are being constructed in all parts of the country except the island-fringed south.

The three relief divisions—Andean chain, central valley, and coast ranges—have been described in Chapter II.

PERU

Iquique

BOLIVIA

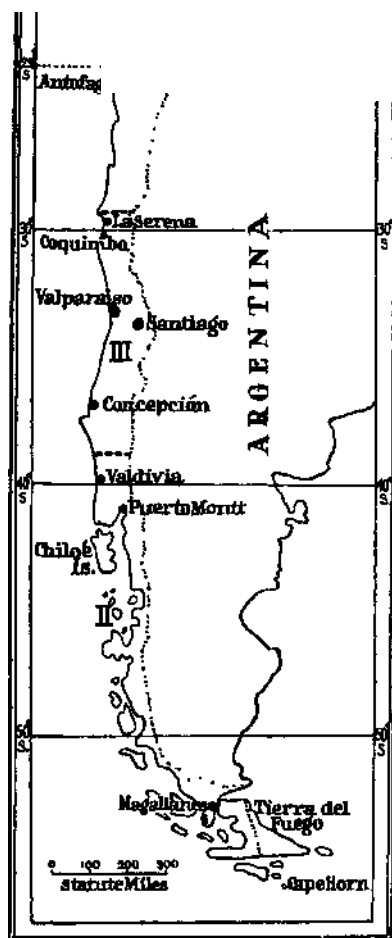


FIG. 56. THB NATURAL REGIONS AND TOWNS OF CHILE
I, the northern desert. II, Southern Chile. III, Central Chile.

CHILE

The great extent of Chile in latitude, from 18° S. to 54° S., naturally results in variations of climatic conditions. Three natural regions, approximately equal in extent and merging into each other, may be distinguished: the northern desert, extending to about 30° S.; Central Chile,



FIGd 57. THE EFFECT OF BLASTING. CALICHE

Caliche is found in great hard masses. Explosives are inserted in holes bored into the *caliche* with pneumatic drills. After the explosion of the charge workers break up the *caliche* into smaller pieces with hammers and picks. The lumps are conveyed in motor-lorries or steam Sentinel wagons to the light railways for transport to the oficina, or works.

By courtesy of the Chilean Nitrate Committee

stretching from 30° S. almost to 40° S.; Southern Chile, lying south of 40° S.

Of these regions Northern Chile lies on the edge of the south-east trade-winds and Southern Chile in the westerly winds, while Central Chile is a transition region, with a climate like that of Northern Chile in summer and Southern Chile in winter.

1. *The Northern Desert.* In Part the coastline runs from

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north-west to south-east, but at Arica, in Northern Chile, it changes direction, and trends from north to south. The change is marked by increased aridity. Northern Chile is, in fact, one of the driest regions in the world. The Andes cut off the trade-winds of the South Atlantic, and winds come most frequently from the south-west—that is, over



FIG. 58. GENERAL VIEW OF BATEAS

The caliche is boiled in water in large tanks, and then run off into bateas, or evaporation tanks, in which the water evaporates, leaving nitrate crystals behind. Notice the nitrate spread on the trays at the sides of the bateas.

By courtesy of the Chilean Nitrate Committee

the cold Peruvian Current—and so are robbed of their moisture before they can affect the land. The air near the coast is generally moist and often cloudy, but a shower of rain is extremely rare—on the average perhaps once a year. Plants of any kind are equally rare, and desert conditions prevail to above 10,000 feet, where the almost equally dreary punas begin. The few rivers that flow down from the Andes disappear long before they reach the sea.

CHILE

It is surprising to find that this region of barren mountains furnishes in its minerals the most valuable source of Chile's export trade. Indeed, Chile is the greatest mining country of South America, furnishing about two-thirds by value of the whole continental output of metals and other minerals.

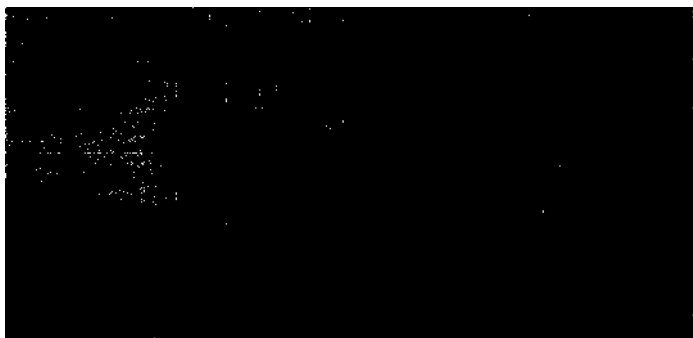


FIG. 59 FILLING BAGS WITH NITRATE FROM THE DRYING-FLOOR

Nitrate from the *bateas* is spread on the ground to dry, and then put into sacks for railway transport to the nitrate ports. Bagging is done by hand, but machines for filling are coming into use. Why is it that all the operations in the nitrate industry can be carried on out of doors?

By courtesy of the Chilean Nitrate Committee

The origin of the most important mineral of Chile—sodium nitrate or Chile saltpetre—is still uncertain, but it cannot be doubted that its preservation is due to the dry climate: even a light rainfall would have dissolved and removed it. The *caliche*, as the crude nitrate is called, is found in basin-like deposits scattered over the desert provinces, extending about 400 miles in length, from 40 to 100 miles inland, and chiefly at elevations of 3000 to 5000 feet. After being dug, or sometimes blasted, out of the

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ground, the *caliche* is carted off to the *ojicinas*, or works, to be purified for export. The crushed *caliche* is boiled in water and the solution evaporated, leaving behind white crystals of sodium nitrate. The dried crystals are packed in jute sacks (imported from Scotland) and dispatched to the ports by railways specially constructed for the nitrate trade.

Nitrate of soda was first exported in 1825, and its inestimable value as an artificial manure led to rapid increases in exportation to the farming lands of Western Europe and North America. Generally over 2,000,000 tons a year are exported, chiefly to Germany, which built up her great sugar-beet industry with its aid, the United States, British Isles, and France. The nitrate is also used in the manufacture of certain chemicals, such as nitric acid. Up to 1914 Chile had a virtual monopoly in the nitrate trade, but during the War her customers, especially the blockaded states of Central Europe, began to pay greater attention to the manufacture of synthetic¹ or artificial nitrates. This new industry proved so successful in producing cheaper manures that after the War the Chilean export declined. This was a serious matter, for not only do nitrates form the chief mineral wealth of Chile, but an export tax of about £3 a ton provides her principal source of revenue. However, following the amalgamation of the leading Chilean nitrate companies, an agreement was reached in August 1930 between the Chilean industry and the two greatest producers of synthetic nitrates, Imperial Chemical Industries, Ltd. (British), and I. G. Farbenindustrie (German). This alliance controls 80 per cent, of the world output, and will regulate production in Chile, where the present output could be maintained for at least a century.

Chile saltpetre contains iodine, which increases its value as a fertilizer. Iodine is easily extracted during the purification of *caliche*, and Chile exports over 1100 tons of

¹ Synthesis means the making up of a compound by combining its parts—the opposite of analysis.

CHILE

iodine per annum, this representing about 80 per cent, of the world's requirements. The amount exported is carefully restricted in order to maintain a fair price level in international trade.

In value copper ranks next to nitrates in the exports of Chile. Copper has been mined in Northern Chile for over three centuries, at first in the coast range, then, with the exhaustion of the mines before the end of the nineteenth century, in the Andes. The output has grown steadily with the introduction of improved methods, and Chile now ranks second to the United States in production. Much of the mining in Chile is carried on at great altitudes.

The mineral is exported through the nitrate ports either in the raw state, as concentrates (containing small proportions of silver and gold), as bars and ingots, or as refined copper. Most of the unrefined copper goes to the smelting furnaces of the United States and South Wales.

Half the world's supply of borax, used in the glass, pottery, tanning, and other industries, is mined from the shallow parts of Lake Ascotan, 15,000 feet above sea-level. Iron, silver, sulphur, and molybdenum are other minerals worked in the desert region.

The nitrate trade supports a population of 250,000 in a land where food for man and beast, clothing, building materials, and machinery, coal, and even water have all to be imported. Most of the water-supply is now brought down in pipes from the Andean streams.

The unbroken coastline has no good harbours, and the ports stand on open roadsteads. Cargoes have to be transported by lighters between ship and shore. There are frequent services of coastal steamers between the ports for passengers and cargoes.

Iquique (37,400) is a well-built town, with electric light and tramways. It is the chief port of Northern Chile, with a big export trade in nitrates and iodine. Railways run inland to the nitrate fields and south to Santiago and the central valley.

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Antofagasta (51,000) not only exports nitrates and copper, but provides a natural terminal port for the trade of Bolivia, carried by rail. There are special warehouses at the port for the storage of goods in transit to or from Bolivia.

Arica (9000), the most northerly port of Chile, lies among the sandhills at the foot of the Morro Headland, the scene of a big battle in 1879 between Chile and Peru. It is proposed to erect there a memorial of the reconciliation of the two countries in 1929. Borax, tin, hides, sulphur, and agricultural produce are exported from Arica, much of the trade being Bolivian. Arica is the terminus of a railway from La Paz.

2. *Southern Chile.* Southern Chile consists of the most southerly portions of the Andes and coast range, largely broken up into islands and peninsulas, separated by deep, winding fiords. South of 38° S. the prevalent westerly winds bring abundant rainfall, so that the islands and mountain slopes are clad with forests of fine trees, beech, pine, red oak, cypress, laurel, and cedar. The greater part of the region is unexploited and practically uninhabited. In time the timber will prove a great source of wealth, especially when closer connexion with Argentina has been established by railways across the Andes, and many valleys provide pastures suitable for cattle and sheep. The hardy Indians of Chiloe Island live upon potatoes, fish, and shellfish. Many of them spend the greater part of the year on the mainland to the north, working upon the railways, at the harvest, or in the forests.

The province of Valdivia is the best-developed part of Southern Chile. In the forest clearings the chief occupations are stock-rearing, dairy-farming, and agriculture, the chief crops—in view of the cloudy, wet climate—being oats and potatoes. Iron and coal are worked near Valdivia City, and a small steel manufacture has been set up.

Valdivia (30,000), called after its founder, Pedro de Valdivia, is the commercial capital of the northern section

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slopes there are taller woodlands of evergreen shrubs with hard, small leaves. Farther up the slopes the

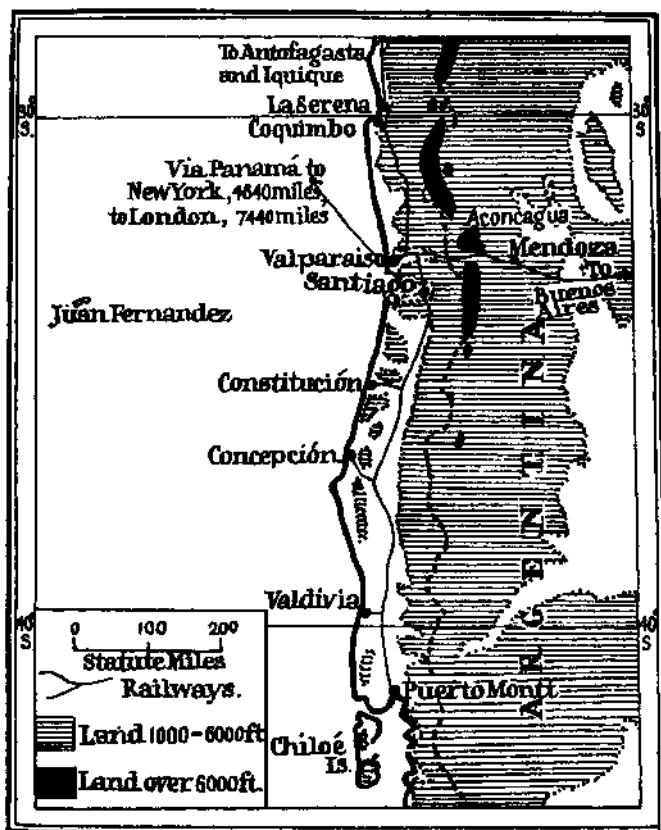


FIG. 60. CENTRAL CHILE: ITS PRINCIPAL TOWNS AND RAILWAYS

Note the broken coast range, the central valley, and the longitudinal and transandine railway?.

increased rainfall is reflected in the forests of evergreen beeches.

Most of the timber in the valley has been cut down to

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free the land for farming. Agriculture is, indeed, the principal industry of Chile, which is self-supporting in respect of food, sugar from Peru being the only big importation.

In the drier northern section stock-rearing, especially of goats and sheep, is the leading occupation, mining of copper and iron coming next. Agriculture is only possible with irrigation. Indeed, irrigation from the mountain streams is practised throughout the central valley, except in the south, where the rainfall is ample. Only a small proportion of the available arable land is under cultivation, the leading grain crops being barley, oats, and wheat. The exportation of barley and oats is more important than that of wheat. An extensive area is under fodder plants—alfalfa and clover.

The hill and valley pastures support many cattle, sheep, and goats, although the number of cattle has declined in the last twenty years. Cattle are killed for home consumption, and their hides are exported. But the home supply of meat is inadequate, and additional supplies are imported from Argentina.

The fruit-growing industry has developed considerably, especially in a region extending about 200 miles to the north and south, centred on Valparaiso. Grapes are particularly important. They are reputed the best in South America, and table grapes of the muscatel type find a ready market in Argentina and countries of the Northern Hemisphere. The trade in Chilean wines is increasing, the exportation of 1928 amounting to over 3,150,000 gallons. Delicious peaches, pears, plums, apricots, melons, and water-melons grow to perfection in the sunny climate of the central valley, while in the wetter southern part of the region apples, strawberries, raspberries, loganberries, and currants are produced in great quantities. Figs, almonds, olives, cherries, oranges, lemons, and walnuts are other fruits of considerable importance. Fresh, dried, canned, and preserved fruits are increasingly exported to other South American countries, to the United States, and to Europe.

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Vegetables are widely grown, and their fine quality has led to a big export to the United States, especially of lentils and beans. Tobacco is grown for home consumption ; honey and beeswax are exported.

The mineral wealth of Central Chile is important. Copper and iron ore (haematite and magnetite) of remarkable purity are worked and exported in great quantities. Chile possesses one of the few sources of coal in South America. The total output of the Chilean mines is only 1 to 1½ million tons per annum—about the same as that of the small Bristol coalfield in England—and most of it is obtained from around Concepcion, where the mines have the advantage of both sea and railway transport. Much of the coal is lignite or brown coal, inferior to the product of British coalfields, so that in the past large quantities of coal have been imported from Great Britain and Australia. In recent years, however, the development of electric power generated by the mountain streams has led to decreasing dependence upon foreign fuel. Parts of the railway-system have already been electrified, and electric power is employed on a large scale in Santiago and Valparaiso.

Since most of the people are engaged in agriculture and mining, the manufacturing industries of Chile lack the additional supplies of labour and capital necessary for extensive developments, although there has been considerable progress since the War. In and near Santiago and Valparaiso there are numerous factories making woollen cotton, and silk cloths; tanning, brewing, sugar-refining, and glass-making are also carried on. Heavy tariffs on imported goods make these industries profitable.

Fish of great variety and excellent quality are abundant off the Chilean coast, largely owing to the fish-food carried in the cold Peruvian Current, but the fishing industry is only in its infancy.

Valparaiso ('Vale of Paradise'), with 195,000 inhabitants, is not only the chief port of Chile, but also the most important commercial centre on the west coast of South

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America. It is the outlet for copper, wines, fruit, and grain, and has the largest import trade of Chile.

The city, when viewed from the ocean, presents a majestic panorama. An ample circle of hills is backed by the snow-capped peaks of the Cordillera. The terraced slopes are covered far and wide with picturesque dwellings, and, when night falls, myriads of electric lamps peep forth, and these lights, extending over hill and dale from point to point of the far outstretching bay, almost vie with the stars.¹

Cliff railways and winding roadways climb to the upper parts of the town. The huge horseshoe bay is sheltered from all winds except the north-west gales of winter. Recent improvements in the harbour, however, allow mail and passenger ships to be moored alongside a sheltering mole.

The local factories produce a variety of commodities, including railway stock, refined sugar, beer, cement, soap, clothing, boots, and cigars.

Santiago ('St James'), with a population of 614,700, the capital and seat of government, lies 116 miles from Valparaiso. It is the fourth city of South America, and perhaps the handsomest and most beautifully situated of all. Santiago stands in a wonderfully productive plain, 1700 feet above the sea, sheltered by the wooded coast range, and with the magnificent snow-capped Andes as a background, over 100 miles away. Railways run to the northern and southern cities, and one line joins the important transandine railway from Valparaiso to Buenos Aires. There is an air-service to Arica, *via* Antofagasta and Iquique.

The old Spanish town of La Serena (15,000), a mining and industrial centre, and Coquimbo (15,000), an important copper port, are the chief towns at the northern end of the central valley. The chief city near the southern end is Concepcion (70,000), a finely built modern town in the centre of the coalfields. There are several other ports opposite gaps in the coast range.

¹ *The South American Handbook.*

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About 370 miles west of Valparaiso lie the three small Chilean islands of Juan Fernandez, the largest of which from 1704 to 1709 was the home of Alexander Selkirk, whose experiences inspired Defoe's immortal adventure story, *Robinson Crusoe*. The island described by Defoe is, however, Tobago, lying north of Trinidad.

EXERCISES

1. On the right-hand side of a double page draw a simple sketch-map of Chile, showing the Andes, coast range, chief towns, railways, and boundaries of natural regions. Divide the rest of the pages into four columns, headed, from right to left, (1) "Position, Relief, Minerals," (2) "Climate, Rivers, Natural Vegetation," (3) "Cultivated Products," (4) "Transport, Towns, Trade." Make in the columns a summary account opposite each natural region.

2. Draw diagrams and add notes for the following statistics (figures given in millions of pounds sterling). Chilean exports (1928): total, £49.1; chief items: nitrate (£23.4), copper (£15.5), iodine (£1.6), wool (£1.3). Chilean imports (1928): total, £30; chief items: textiles (£4), petroleum £1.4, sugar (£1.3), motor-cars (£1.3).

3. Compare Valparaiso with Bahia with regard to position and trade.

CHAPTER XII

THE LAND OF THE FUTURE

A STUDY of the countries of South America cannot fail to reveal their amazing natural wealth. The Americas represent the firstfruits of the great Age of Discovery dating from 1492. Yet until fairly late on in the nineteenth century South America was backward, and its share of international trade relatively unimportant. Even to-day the population is extremely small, while extensive areas are little known and almost uninhabited. It is important to realize the reasons for this delayed development.

Spain and Portugal shared control of South America for over three hundred years, so that they were responsible for the opening up and colonization of the continent. But the smaUness of their populations proved a handicap—their present inhabitants number less than 30,000,000. The natural difficulties in the way of transport—dense forests, lofty mountain ranges, and arid regions—limited permanent settlement to the more favourable sections of the coastlands and the healthier plateaux of the Western Cordillera.

The fact that Spain was overwhelmingly interested in precious metals and stones has already been emphasized. Such commodities of great value and small bulk could be profitably transported to the coasts by boats on the rivers, or by cattle and mules on long overland trails. It did not pay to carry less valuable products by these routes. Throughout the colonial period the Spanish colonies were governed by a few men who practically enslaved the natives for two purposes: working the mines and transporting the minerals. The exhaustion of the richer and

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more accessible deposits and, later, the opening up of new supplies in North America, Africa, and Australia led to a serious decline in the mineral trade of South America.

Stock-rearing and agriculture during the colonial period were even less important than mining.

The modern development of South America did not begin until the old Spanish colonies had achieved their independence. Even then progress was extremely slow, as many great difficulties still persisted: rebellions, interstate wars, boundary disputes, transport problems, lack of capital and labour, shortage of fuel supplies, vastness of private estates.

Fortunately these handicaps are being overcome. Revolutions occur far less frequently nowadays—improved communications make the success of a rebel leader extremely unlikely. There is an increasing tendency for South American countries to settle their disputes by conference or arbitration rather than by warfare: indeed, South America faces fewer political problems that might lead to warfare than does Europe. Naturally more settled political conditions have made Europeans and North Americans more ready to invest their capital in the transport and industrial developments of South America.

On December 2, 1823, during the period in which the South American republics were severing their ties with Spain, and Brazil was establishing itself as a separate Portuguese empire, there was uttered by President Monroe of the United States a message to Congress of very great importance in international history. The main theme of this message may be gathered from the following brief extracts:

The occasion has been judged proper for asserting, as a principle in which the rights and the interest of the United States are involved, that the American Continents, by the free and independent condition which they have assumed and maintain, are henceforth not to be considered as subjects for future colonization by any European powers . . .

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With the existing colonics or dependencies of any European Power we have not interfered and shall not interfere. But with the governments who have declared their independence and maintained it, and whose independence we have on great consideration and on just principles acknowledged, we could not view any interposition for the purpose of oppressing them, or controlling in any other manner their destiny, by any European Power in any other light than as the manifestation of an unfriendly disposition towards the United States.

This statement of policy is known as the Monroe Doctrine. It finally put an end to any attempts on the part of European Powers to annex portions of South America. Above all, it guaranteed very effectively the newly won independence of the republics, and left them free to solve their own difficulties and determine their own lines of development as individual nations.

Toward the end of the nineteenth century the world's resources in foodstuffs and other commodities were increased more rapidly than ever before. These developments were due to the skill, enterprise, and capital of peoples of European stocks in opening up the agricultural, pastoral, and mineral resources of vast temperate lands: the United States, Canada, South Africa, and Australia. South America shared in this progress, but it must not be forgotten that the greater part of the continent lies within the tropics. Only in Argentina, Uruguay, Chile, and South Brazil do there exist temperate lands similar to those of Europe and North America. It is therefore in these countries that most progress has been effected, especially during the last half-century, following upon the introduction of railways, establishment of freezing-works, extensive sowing of alfalfa, devotion to grain crops, and increased immigration of European settlers.

Shortage of fuel has been a grave disadvantage in many parts of South America, and for a long time delayed the establishment of manufacturing industries. But the dis-

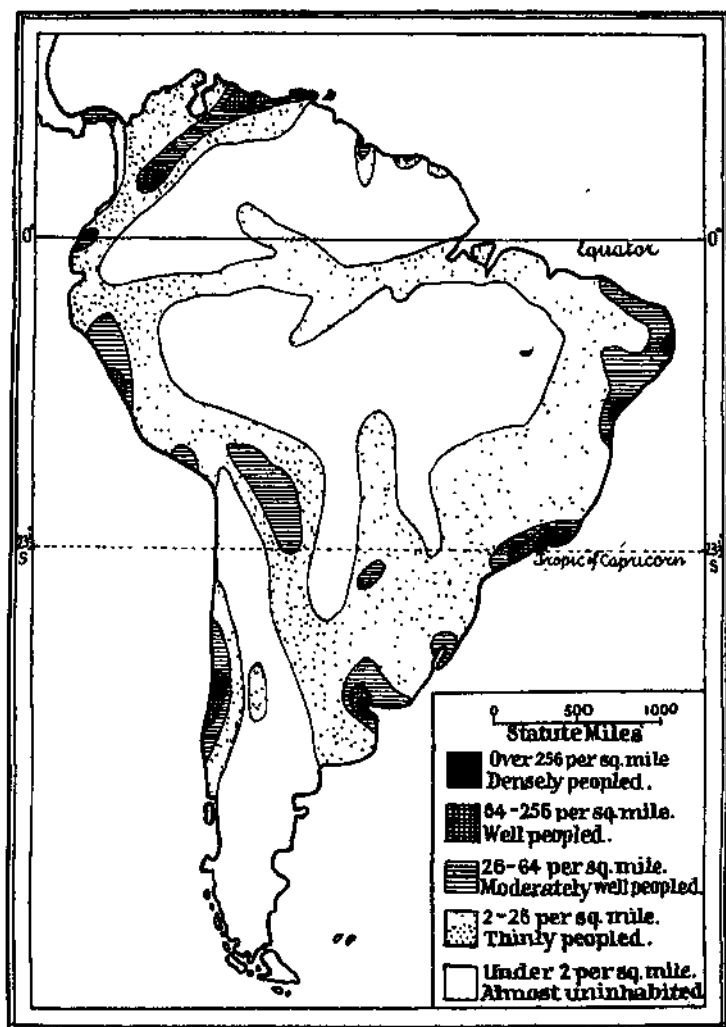


FIG. 61. THE DISTRIBUTION OF POPULATION

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covery of petroleum at many points along the flanks of the Andes has provided a new source of power, while the vast potential hydro-electric power of the mountainous regions has only been tapped on a very small scale. Raw materials for metal, textile, and other industries already exist in abundance, and one day several parts of South America will be densely peopled manufacturing areas.

After their periods of depression the mining industries of South America are once more in a flourishing state. But gold, silver, and nitrate, so important in the past, are becoming exhausted, and to-day other minerals have more than taken their place. Copper, tin, iron, manganese, petroleum, bismuth, borax, salt, and sulphur are increasingly extracted from supplies that seem well-nigh inexhaustible.

Stock-rearing has probably passed its zenith in the temperate lands of South America, and the displacement of animals by cultivated crops is likely to continue. It is therefore the extensive savanna lands that present the greatest opportunities for the future expansion of the animal-rearing industries.

Most of the lands best suited to temperate crops are already under cultivation, and great advances in the future must depend on intensive farming more than upon the opening up of fresh territory.

The native peoples of South America have played practically no part in the modern development of their continent. The same may be said of the descendants of the African negro slaves. When one realizes that these peoples form a considerable proportion of the population of tropical South America the backwardness of these regions is partly explained. The number of pure whites is very small, so that progress in these hot lands depends in great measure upon the mestizos, who are physically adapted to their surroundings, and also capable of profiting by the civilization and scientific methods of the white man.

The future of South America lies in its tropical rather

SOUTH AMERICA

than its temperate lands. Early attempts to exploit the resources of tropical South America suffered serious handicaps, and inevitably declined in face of the competition in

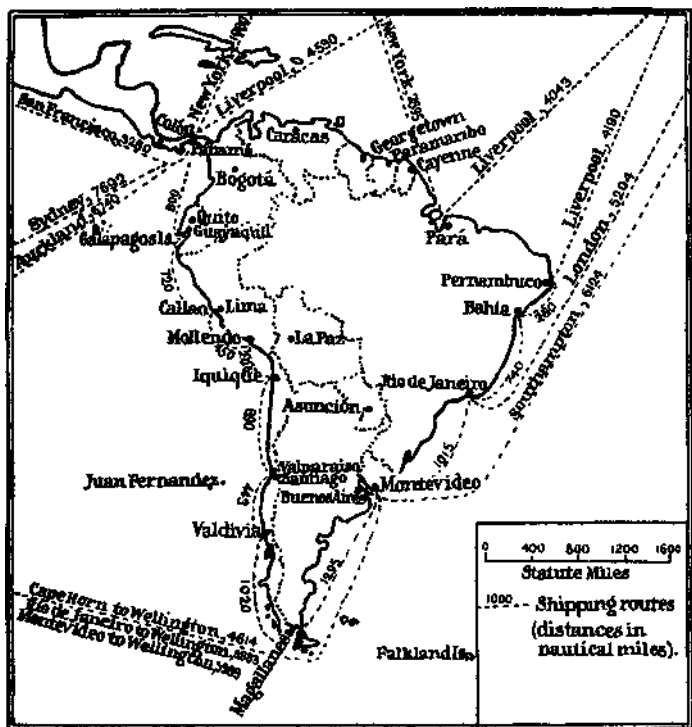


FIG. 63. THE PRINCIPAL SHIPPING ROUTES, COUNTRIES, CAPITALS, AND CHIEF PORTS OF SOUTH AMERICA

more favourably equipped lands in other parts of the world. Collection of produce without due care in conserving or re-creating supplies—as in the rubber and cinchona industries—and the prevalence of primitive methods have tended to delay the development of tropical South America. Transport problems still remain, but they will

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assuredly be overcome in time. Increasing knowledge of hygiene and the treatment of tropical diseases is lessening the toll of human life. Scientific methods of cultivation are being introduced in the tropics as they have been in the temperate zone. The population of the world steadily increases, and as the temperate lands find it ever more difficult to supply the needs of mankind our dependence upon the tropics must necessarily increase. Since the Great War, and aided in some measure by the opening of the Panama Canal, there have been definite signs of coming great developments in the northern countries of South America. The vigorous and progressive peoples of the southern part of the continent are steadily penetrating inland and northward, and their influence will be a potent factor in the exploitation of the interior. The nineteenth century was a period of amazing expansion in temperate lands, which poured into the world's markets their huge stores of grain, meat, fruit, wool, cotton, timber, and metals. The twentieth century may witness a parallel development of the tropics, in which South America, with its wealth of timber and its capacity for producing meat, maize, mandioca, rubber, coffee, sugar, cacao, fruits, and a thousand other commodities, cannot fail to play a leading part. South America is no longer a continent available for European exploitation; her peoples have realized the high destiny that awaits them, and their civilization and economic development are alike progressing toward its fulfilment.

GENERAL EXERCISES

(The index will be found helpful in attempting these questions.)

i. Show how the place-names of South America afford indications of its explorers and settlers.

2. Point out the chief difficulties in the way of the development of the Northern Andean states.

3. "The future of South America lies in its tropical rather than its temperate lands." Discuss this statement, and show to what extent it is true.

4. Express as briefly as possible the meaning of the Monroe Doctrine, and point out how it has affected the settlement and development of South America.

5. Give some account of the part played by the following peoples in the history and development of South America: Incas, Spaniards, Portuguese, Italians, British.

6. Write brief notes on the production and importance of the following South American commodities: cacao, sugar, cotton, yerba mate, fruit, quebracho, rubber. Indicate their distribution on an outline map.

7. Where in South America is coffee an important item in export trade? Give an account of this coffee industry.

8. Why are coasting vessels so important in South American transport? Describe a voyage in a coasting vessel, calling at various ports, from Callao to Rio de Janeiro, via Panama.

9. Give an account of the present mineral productions of South America, illustrating your answer with a map.

10. Examine the railway map of South America. Explain why certain regions are well served, while others have practically no railways. Mention examples of (a) transcontinental routes, (b) railways built to overcome the transport break due to falls or rapids.

n. Write a reasoned account of the distribution of population in South America, showing how it is controlled by conditions of relief and climate.

12. With which parts of the world do South American countries carry on the bulk of their trade? Why is it that there are few important shipping routes between South America and the other southern continents (Africa and Australia)?

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13. Write brief accounts of the South American islands mentioned in this book. Point out which are continental and which oceanic islands.

14. Write short geographical accounts of (a) Patagonia, (b) the llanos, (c) the montafia.

15. Which three pictures in this book do you consider convey most geographical information? State briefly what facts one may learn from the three you have selected.

16. If you had to earn your living in South America, what occupation would you select 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.

17. Give an account of cultivation in those parts of South America in which artificial irrigation is practised.

STATISTICAL APPENDIX

The statistics are based upon those given in "The Statesman's Year-book" for 1930.

The values of imports and exports are the averages of the years 1927 and 1928, except for French Guiana, where they are the values for 1928.

STATE	AREA IN SQUARE MILES	POPULATION, WITH YEAR OF CENSUS OR ESTIMATE	EXPORTS IN MILLIONS STERLING	IMPORTS IN MILLIONS STERLING
Argentina.	1,153,89	10,646,814 1928)	203.89	176.15
Bolivia	514,155	2,861,212 1928)	9.71	5.15
Brazil	3,275,510	39,103,856 1928)	93.05	85.15
British Guiana	89,480	307,784 1928)	3.39	2.64
Chile .	290,119	4,364,395 1929)	45.67	28.41
Colombid .	440,846	7,967,788 1928)	22.56	25.19
Curacao .	210	43,581 1928)	21.67 ¹	22.32 ^x
Dutch Guiana	54,291	148,960 1929)	.93	.77
Ecuador .	109,978	1,502,500 1926)	3.87	2.82
Falkland Islands	4,618 ²	2,296 1928)	4.17	.67
French Guiana	34,74 ^o	47,341 1926)	.24	-.46
Panama .	32,380	442,522 1923)	.81	3.11
Panama Canal Zone	553 8	30,300 1929)		
Paraguay .	61,647	836,360 1928)	3.01	2.62
	I 100,000 disputed			
Peru .	532,047	6,147,000 1927)	31.35	18.49
Trinidad .	1,862	397,093 1928)	6.35	5.18
	Tobago, 114)			
Uruguay .	72,153 1	1,808,286 1928)	17.97	16.04
Venezuela.	393,874 I	3,053,497 1926)	20.85	15.42

For comparison the corresponding figures for the United Kingdom are given:

POLITICAL DIVISION	AREA IN SQUARE MILES	POPULATION (1921)	IMPORTS IN MILLIONS STERLING	EXPORTS IN MILLIONS STERLING
England .	50,874	35,681,000	I 1,1953	8442
Wales	7,466	2,205,000		
Scotland.	30,405	4,882,000		
Northern Ireland .	5,221	1,253,000		

¹ Including the trade of the other small Dutch West Indian islands.

² Excluding the dependencies. ³ Figures for 1928.

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