

COMPTON'S

A
Britannica
Publication

VOLUME

22

South—Syrin
pages 263-550

Compton's
Encyclopedia
and Fact-Index

1987 EDITION COMPTON'S ENCYCLOPEDIA

COPYRIGHT © 1987 by COMPTON'S LEARNING COMPANY
DIVISION OF ENCYCLOPAEDIA BRITANNICA, INC.

All rights reserved for all countries.

No part of this work may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher.

COPYRIGHT © 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987

BY COMPTON'S LEARNING COMPANY, DIVISION OF ENCYCLOPAEDIA BRITANNICA, INC.

Library of Congress Catalog Card Number: 85-73401
International Standard Book Number: 0-85229-444-1
Printed in U.S.A.



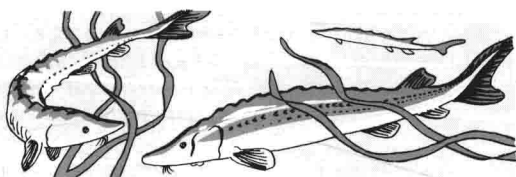
THE UNIVERSITY OF CHICAGO

COMPTON'S ENCYCLOPEDIA IS PUBLISHED WITH THE EDITORIAL ADVICE
OF THE FACULTIES OF THE UNIVERSITY OF CHICAGO

"Let knowledge grow from more to more and thus be human life enriched"

EXPLORING COMPTON'S—VOLUME 22

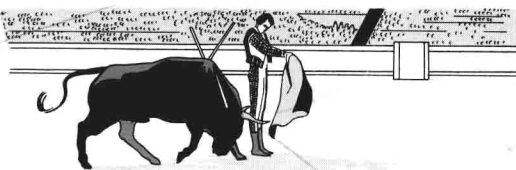
What bird's nests are used as food? 532.
 Why were stilts invented? 448.
 Why is the swan called the "royal" bird? 521.
 What book written as a satire on human nature has become a children's classic? 532.
 What American novel helped bring about a war? 483.
 How do water spiders get air into their nests at the bottom of ponds? 386.
 What substance made from coal tar is 400 times sweeter than sugar? 509.
 What bean is used for plastics and paint as well as for food? 340.
 Are sponges plants or animals? 393.
 Why do sycamores shed their barks? 548.
 Does the flying squirrel really fly? 401.
 Why isn't spider thread used for making cloth? 383.
 How do stones tell the progress of man? 455.
 What ancient state had two kings at the same time and why? 369.
 How has science been able to tell what stars are made of? 371-2.
 What was the *Intelligent Whale*? 493 picture.
 Why is silver tarnished by eggs? 509.
 How do we know that some of the stars are "dead"? 412.
 Looking at the sun through a telescope can cause blindness. What is a safe way to study it? 512.
 How did the Bowery get its name? 492.
 How did Sir Isaac Newton find that white light is really a mixture of colored lights? 371.
 Who guessed the riddle of the Sphinx? 379.
 How does a stickleback build its nest? 447.
 How are spruces distinguished from pines and firs? 398 picture.
 Why is the sword considered the "most romantic of weapons"? 546.
 For what change in the art of heating was Benjamin Franklin responsible? 483.
 Tell briefly how the spice trade has affected the course of history. 381.



From what fish do we get caviar and isin-glass? 492.

How many stars are believed to exist? 412.
 What South American animal is the world's largest rodent? 272.
 Where and how did the mestizo racial group emerge? 282.
 What city was called the "salt cellar of the nation"? 549b.
 What is the world's largest flying bird? Where is it found? 273 picture.


What is the large grassland in Argentina called? 281a.
 What artist painted the "Athenaeum" portrait of George Washington, which is reproduced on currency? 490a.
 How do spiders travel to islands hundreds of miles from the mainland? 384-5.
 What is the name of the wavelike muscular movement that takes place throughout the digestive tract? 454.



In what European country is bullfighting considered the "national sport"? 355.

Where is the world's longest all-electric railroad? 524.
 What is the highest large, navigable lake in the world? Where is it located? 279.
 What is the only city in the United States where cable cars are still in use? 488.
 What is the difference between an artesian spring and an artesian well? 396.
 Who was the first man to travel into outer space and back? 346 picture.
 Who led the most formidable slave uprising in the history of Rome? 370.
 What emperor was the last monarch in the Americas, and what country did he rule? 292 picture.
 What two countries occupy the Iberian peninsula? 349.
 What plant lives on insects? 517.
 What is implied by the adjective "Spartan"? 368.
 What are some effects of weightlessness on the human body? 346a.
 What war began as a result of the sinking of the American battleship *Maine*? 364, 365 picture.
 Who was known as the "George Washington of South America"? 293 picture.
 What speed is required for a spacecraft to escape from the earth's gravitational force? 343.
 What does a philatelist collect? 405.
 Which one of the 50 states has a one-house (unicameral) legislature? 429.
 What is the largest body of fresh water in the world? 518.
 What are "full-fashioned" hose? 449.
 What is the world's rarest postage stamp? How much is it worth? 406 picture.
 Which is the brightest of all the stars? 413.
 Does all issued stock have par value? 452.
 Who are the "star boys"? 525.
 What is the meaning of the term "star chamber"? 424.
 What event stirred a khedive of Egypt to entertain more than 6,000 persons? 503.

KEY TO PRONUNCIATION



Pronunciations have been indicated in the body of this work only for words which present special difficulties.

Marked letters are sounded as in the following words:

cāpe, āt, fār, fāst, whāt, fāll; mē, yēt, fērn, thére;

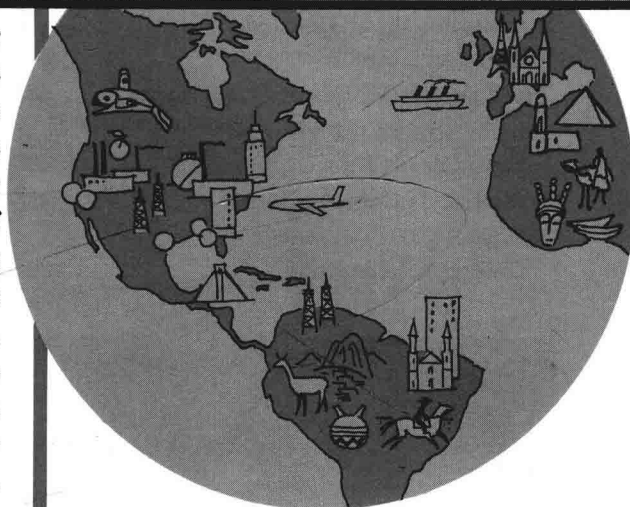
īce, bīt; rōw, wòn, fôr, nôt, dọ; cūre, bŭt, rŭde, fŭll, bŭrn; out;

ü = French *u*, German *ü*; ġem, ġo; thĭn, thĕn;

ñ = French nasal (*Jeañ*); zh = French *j* (*z* in *azure*); K = German guttural *ch*.

HERE AND THERE IN VOLUME 22

AT ODD TIMES when you are just looking for “something interesting to read,” without any special plan in mind, this list will help you. With this as a guide, you may visit faraway countries, watch people at their work and play, meet famous persons of ancient and modern times, review history’s most brilliant incidents, explore the marvels of nature and science, play games—in short, find whatever suits your fancy of the moment. This list is not intended to serve as a table of contents, an index, or a study guide. For these purposes consult the Fact-Index and the Reference-Outlines.



Picture Highlights

The Faces of Mount Rushmore	321
Man on the Moon	341
What Men of Old Saw in the Skies	422-3
An American Bouquet	427
A Tornado Caught in Action	459
An Atomic-Powered Submarine—The USS ‘Nautilus’	495a-b

Reading for Pleasure

The Fabulous Sphinx	378
Stanley’s Search for Livingstone	410
Stars—Atom Furnaces in Space	412
Starfish and Sea Urchins	424
How the States Got Their Names	428
Sword—Most Romantic of Weapons	546

School and Home; Work and Play

Turning Sounds into Code	375
Stamps for Postage and for Collectors	405
The Golden Sounds of Storytelling	460

The Secret of Successful Study	491
Subtraction—A Basic Arithmetic Skill	497
The Sunday-School Movement	516
The Challenge of Surfing	519
Swimming—The Crawl and Other Strokes	533

Historical Highlights

The Southwest—A Spanish- American Land	337
“Remember the Maine!”	364
The Hard Spartan Life	368
When All Man’s Tools Were Made of Stone	455

Famous People

The Thracian Slave Spartacus	370
The German Philosopher Spengler, Author of ‘The Decline of the West’	377
Johanna Spyri, Who Wrote ‘Heidi’	398
Stalin—Soviet Russia’s “Man of Steel”	402
Miles Standish, Pilgrim Leader	410

The Inventor George Stephenson	443
Stevenson—Stout-Hearted Teller of Tales	446
The Priceless Violins of Stradivarius	484
Johann Strauss the Younger, the Waltz King	485
Stravinsky's Complex Music	485
Gilbert Stuart, Portraitist of George Washington	490a



The Plant and Animal Kingdoms

The Useful Soybean	340
Spices—Nature's Flavor for Our Foods	379
Spiders—Nature's Most Expert Spinners	382
Sponges—Simple Sea Animals	393
Squirrels—Wild Animals of City and Forest	399
The Bird of Good Fortune	456
Sugar from Cane and Beets	505
Swan—The "Royal" Bird	521

The Wide World of Facts

The Twin Crafts That Produce Cloth	388
Statehood—How a Territory Becomes a State	429a
How to Read Statistics	430
Stocks and Bonds as Investments	450
Streetcars—From Horse Car to Trackless Trolley	487
Submarines—"The Silent Service"	493
Supreme Court of the United States	518a
The Treatment of Diseases by Surgical Operations	519a

Marvels of Science and Invention

Space Travel—Exploring Beyond the Earth	341
Spectrum Analysis with the Spectroscope	371
Steam Engines for Useful Work	438
Sun—The Star Nearest to the Earth	512

The Arts

Spain's Contribution to World Literature	365
The Spenserian Stanza	378
Swift—Unhappy Genius Who Created Gulliver	530



At Home and Abroad

South Africa—Land of African, Boer, and Briton	263
South America—A Rich and Varied Continent	268
South Carolina—The Palmetto State	305
South Dakota—State of Farms, Mines, and Natural Beauty	321
Spain—Once Europe's Greatest Power	349
Stockholm—"Venice of the North"	448
Stratford-on-Avon, Where Shakespeare Lived and Died	484b
Sudan—Africa's Largest Country	501
Sweden—A Trading Nation Dedicated to Peace	522
Switzerland's Practical People and Magnificent Mountains	536
Sydney—Gateway to Australia	548



Most of South Africa lies on this great plateau—the high veld. The outcroppings of rock in the background are called kopjes.

Photographs, Life © Time, Inc.

SOUTH AFRICA—Land of African, Boer, and Briton

SOUTH AFRICA, Republic of. After more than 50 years of political ties with Great Britain, the Union of South Africa became an independent republic in 1961. Shortly before its new status became official the country withdrew from the British Commonwealth. This step was taken because other Commonwealth members severely criticized South Africa's harsh racial policies, long a source of tension and trouble in the republic. For years severe racial segregation laws have aroused bitter resentment among the African Negroes, mixed races (called *coloreds*), and Asian Indians. These people outnumber the European whites in South Africa by more than four to one.

The Land and the Climate

This land of unrest and tension forms the southern tip of Africa and lies between the Atlantic and Indian oceans. Ramparts of hills rise from low-lying coastal plains step upon step, with terraces of small, barren



Sandy beaches stretch for miles along the coast. Here at Muizenberg, a resort suburb of Cape Town on the eastern side of the Cape of Good Hope, the waters of the South Atlantic are warmed by the Agulhas Current from the Indian Ocean.

plateaus (*karroos*) between. The hills ascend until suddenly the whole vast region opens into a great plateau, the high *veld*, from 4,000 to 6,000 feet above the sea. Here the treeless, grass-covered, rolling plain stretches for miles northward toward the equator.

Mountains along the eastern and southern coasts, chiefly the Drakensberg, capture the moisture of the southeast trade winds. As a result the interior and west coast are largely arid or semiarid. Here the Kalahari and Namib deserts are made even drier by prevailing westerly winds and the cold Benguela Current flowing up the west coast. The seasons are the reverse of those in the Northern Hemisphere. The summer months are from December to February.

Location and Size.—Southern tip of Africa. Greatest width, 1,050 miles, between Atlantic and Indian oceans. Southernmost point, Cape Agulhas. Area (excluding Transkei and Bophuthatswana), 440,521 sq. mi. Population (1976 preliminary census), 26,129,000.

Products.—Corn, wheat, sugar, tobacco, citrus fruits, grapes, peanuts; sheep, cattle, wool, hides and skins; gold, diamonds, coal, uranium, copper, asbestos, manganese, iron ore, chromite, antimony; foods and beverages, chemicals, textiles, wearing apparel, metal products, machinery, appliances, automobiles (assembly).

Provinces.—Cape of Good Hope; Natal; Orange Free State; Transvaal. Administers South-West Africa.

Cities (1976 estimate). Johannesburg (1,371,000); Durban (854,662); Cape Town (legislative capital, 842,620); Pretoria (administrative capital, 634,400); Port Elizabeth (468,797); Germiston (216,200).

SOUTH AFRICA

Winter is from June to August. In the greater part of South Africa the climate is dry and bracing, with most of the rain falling in the summer. The Cape Peninsula, however, has a Mediterranean climate, with warm, dry summers and mild, rainy winters. Only a small part of South Africa has sufficient rain for crops.

Native Plants and Animals

The high veld is grassland where the rainfall is scanty. Scattered bush and scrub grow in the semiarid karroos. Tropical and semitropical plants flourish in the Mediterranean climate of the southern Cape Province, sometimes called the "palm belt." Forests are found chiefly in the high, wet regions of Natal and in the eastern Cape Province. In the Kalahari and Namib deserts to the west, thorn and acacia trees grow among the desert bush and grasses.

The animals that once roamed all South Africa are now abundant only in Kruger National Park in the Transvaal, in the Etosha Pan in South-West Africa, and in the smaller game reserves. They include the antelope, zebras, giraffes, buffalo, elephants, hippopotamuses, and baboons and other monkeys. Among the meat eaters are lions, leopards, wild dogs, hyenas, and jackals. The aardvark, golden mole, and elephant shrew are also native to the region. The many birds include ostriches, vultures, hornbills, and secretary birds, which are found only in South Africa. Reptiles are represented by crocodiles, pythons, and a variety of the smaller snakes. The termite, or white ant, is

one of the many insects. (See also articles on animals listed here.)

The Three Major Population Groups

Negroes make up more than two thirds of South Africa's people. There are several hundred tribes, collectively called Bantu, including Zulu, Mashona, Matabele, Swazi, Bechuana, Basuto, Xosa, and Fingo. Also of Negroid stock are Bushmen and Hottentots.

About one third of these Africans live on tribal "reserves" set aside by the government. Here only the African is permitted to occupy or own land. Most reserve lands are communally held and overcrowded. The people support themselves by a primitive agriculture. The chief crop is corn (mealies). Many of the younger men work as laborers in mines and other industries of the cities. In urban areas about one half of the Africans live in controlled "locations." They are employed in mining, manufacturing, and other industries and as domestic servants. The remainder "squat" in "shanty towns" where overcrowding and slumlike conditions are serious problems. African farm laborers are either paid a small wage or live on the farm, graze cattle, and cultivate land in return for working a fixed number of days.

The white, or "European," population is the second largest group. This group is divided on the basis of the nation's official languages—English and Afrikaans. Afrikaans is similar to Dutch, but many German, French, and English words have been adopted. English-



The tip of Africa was once British territory. In 1961 South Africa, an independent nation, became a republic and withdrew from the Commonwealth. It holds a disputed mandate over

South-West Africa. Botswana (formerly Bechuanaland Protectorate) and Lesotho (formerly Basutoland) achieved independence in 1966. Swaziland became independent in 1968.



Photographs, Camera Press—Pix

A child stands by shanties in the African section of Grahams-town, a cathedral city and educational center on the Cape of Good Hope. The field workers at right are muffled against wind.



speaking South Africans are largely from Great Britain and the white dominions of the Commonwealth. Generally, they live in the cities and control most of the industries. Afrikaans-speaking South Africans are called *Afrikaners*. They are almost all descended from the Dutch, Huguenot, and German colonists who first settled South Africa. This group makes up most of the farm population. The word *boer* means farmer.

The third group is the coloreds. A colored is one who has some European blood but is not of "pure" European origin. He may vary in physical features and color from Negroid to characteristics indistinguishable from European. Most coloreds live in and around Cape Town and are called Cape Colored. The mixed races also include Malays and some Bushmen and Hottentots.

Natural Resources and Industries

South Africa has enormous mineral wealth. It produces about one half the world's annual supply of gold (see Johannesburg). In Africa it ranks second only to Zaire (formerly the Democratic Republic of the Congo) in diamond production (see Diamond). It is one of the world's largest producers of antimony. Lead, zinc, and copper are mined in large amounts, principally at Tsumeb in South-West Africa and at Okiep. Coal deposits of the Transvaal and Natal yield millions of tons annually. Iron, platinum, and other minerals are also found. Uranium oxide is extracted from gold ores in the Transvaal.

The vast, high veld is used chiefly for grazing, and South Africa is one of the world's leading wool producers. Goats are raised for mohair. Hides, butter, and cheese are important exports. The ostrich farms of the Cape provide about 85 percent of the world's plumes. Extended irrigation has increased production of grains and fruits. The largest crop is corn. Wheat, barley, and oats are also grown. On the Natal coast tobacco, sugar cane, and tea flourish. Dried, canned, and fresh fruits are exported from the Cape Province, which is also the center of the wine industry.

Manufacturing was stimulated after World War I. The second World War spurred the growth of heavy industry. Important industries are fishing, leather tanning, tobacco manufactures, and textiles.

Government and Education

South Africa's four provinces are the Cape of Good Hope, Natal, the Orange Free State, and the Transvaal (see also articles on these provinces). South Africa exercises political control over South-West Africa. When the republic came into existence in 1961, a new constitution provided for a president to replace the old post of governor-general. The president is elected for a seven-year term by an electoral college made up of both houses of parliament (the Senate and the House of Assembly). Senators and representatives serve five-year terms, subject to possible dissolution of parliament. The highest court, the Appellate Division, consists of a chief justice and nine judges of appeal. There are lower courts in the provinces. Pretoria is the administrative capital, Cape Town the legislative seat (see Cape Town). Windhoek is the capital of South-West Africa.

Education is compulsory from ages 7 to 16. There are separate schools for Europeans, Negroes, coloreds, and Indians; in the Transvaal there are separate schools for the Chinese. The 16 universities are also segregated on a racial basis—11 are for the Europeans, 3 for the Negroes, one for the coloreds, and one for the Indians. There are also many technical colleges and teacher-training colleges, most of them serving the Negro group.

History of South Africa

The European discoverers of the country were Portuguese mariners looking for a route to the Indies. Bartholomew Diaz rounded the Cape of Good Hope in 1488 (see Diaz). Vasco da Gama made the passage to India in 1497–98 (see Gama). The first landing, in Table Bay in 1503, was made by the Portuguese, but they never attempted to settle the Cape.



THE "WHITE HOUSE" OF SOUTH AFRICA

Groote Schuur (great barn) lies on the lower slopes of Devil's Peak, near Cape Town. This handsome example of Dutch colonial architecture was once the home of Cecil Rhodes. He left it in trust to be the official residence of the prime minister.

In the 17th century, the Dutch East India Company required a supply station for the long voyage to the Indies. In 1652 they sent Jan van Riebeeck to establish it. The station gradually developed into a colony. When the Dutch arrived, this almost empty land was populated only by a small group of Bushmen and Hottentots in the Cape. The Dutch imported Negro slaves from the east and west coasts of Africa. Malays and Javanese came from the Indies. There were few white women in the early days and there was considerable blending of the population. Thus there appeared in the Cape area the mixed group known as Cape Colored. Cape Town became the greatest port of the Southern Hemisphere and was called the "tavern of the seas."

Before and during the 17th century, while the Dutch were penetrating northward from the Cape, there was a great migration of dark-skinned Africans

southward from the vicinity of the equator. These were the peoples now collectively called Bantu. The Bantu from the north were invading South Africa at approximately the same time that the Europeans in the Cape began to move northward. Thus neither had any right to claim original possession of the country.

The British Gain Control

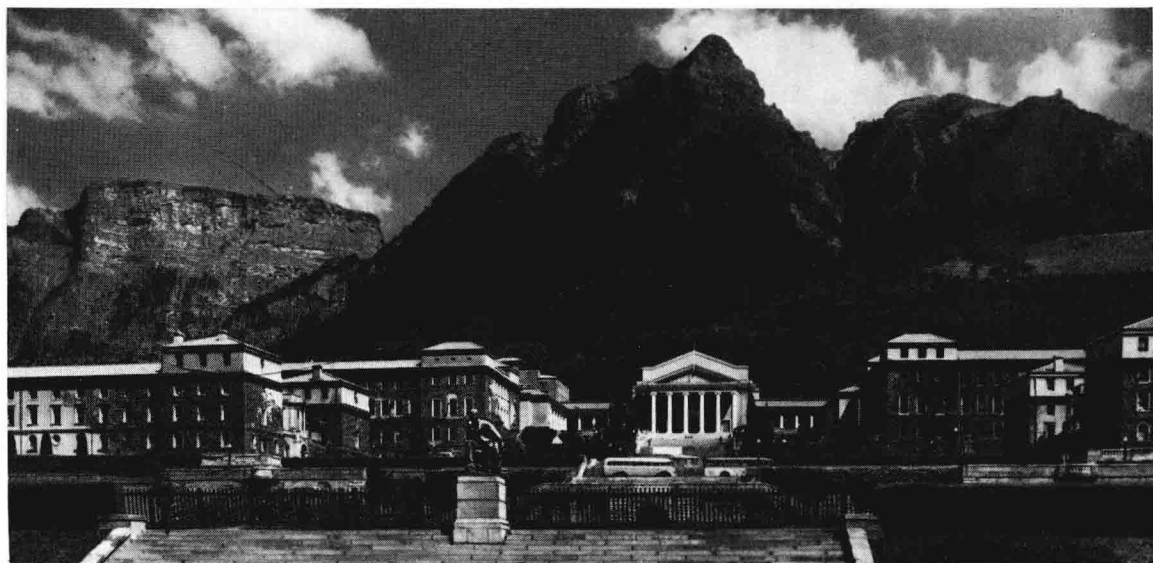
During the French Revolution and Napoleonic wars the British occupied the Cape as protectors of the Dutch. As Holland changed from side to side in the European conflict, the British evacuated and then reoccupied Cape Town. Finally, after the Congress of Vienna, Britain retained possession of all South African territory thus far settled by Europeans.

The Dutch (Boers) and English found it difficult to live together. The Dutch pattern of life had been formed during centuries when the national economy was based upon the institution of slavery. When slavery was abolished throughout the British Empire in 1833, bitter resentment spread among the Boers.

The Great Trek

Many Boers loaded their families and portable possessions upon great ox-drawn wagons, and about 1836 the Great Trek began. Large and small bands of *Voortrekkers* set off to the north and east. Facing many hardships, including hostile tribes, they crossed the Orange and Vaal rivers into the great plains of the high veld. Other bands crossed the Drakensberg into Natal. The trekkers eventually established two republics, the Orange Free State and the Transvaal, where they hoped to carry on the old Afrikaner ways of life without interference from the British. In Natal they failed because the British were too firmly entrenched.

The South African conflict now involved three peoples: Boers, Africans, and British. The Boers on the



A GREAT AFRICAN UNIVERSITY

The University of Cape Town is also on the Groote Schuur estate. Cecil Rhodes chose the site, and Edward VIII, then Prince of

Wales, laid the foundation stone in 1925. Devil's Peak is in the center and to the left is the flat-topped Table Mountain.



ONE OF SOUTH AFRICA'S CAPITALS

In front of the government buildings in Pretoria, the administrative capital, stands the statue of Louis Botha, great Boer general and first prime minister of the Union of South Africa.

frontiers battled with the Africans onto whose tribal lands they had settled. The British to the south still regarded the Boers as British subjects. At one time Britain annexed the two republics. Then it restored their independence but retained control over their foreign affairs. Natal became a British colony.

The discovery of gold and diamonds increased the tension mounting between British and Boers. The diamond fields of Kimberley were discovered in 1869; the Witwatersrand gold deposits, about 1885. Adventurers poured into the Orange Free State and the Transvaal, particularly from the Cape Colony and England. Johannesburg became a great city (see Johannesburg).

The newcomers, called *uitlanders* (outlanders), were supported by Cecil Rhodes, prime minister of Cape Colony (see Rhodes, Cecil). The Boers led by Paul Kruger of the Transvaal, tried to defend their pastoral way of life against the intruders (see Kruger).

Leander Jameson's raid on the Transvaal in 1895 aroused new bitterness among the Boers. In 1899 war broke out with Great Britain. The Orange Free State joined the Transvaal and both were defeated (see Boer War). By the Treaty of Pretoria (1902) they lost their independence and became British colonies.

In 1907 internal self-government was restored to the Boers. The South Africa Act, passed by the British Parliament in 1909, provided for the formation of the Union of South Africa, and on May 31, 1910, the four crown colonies (the Cape of Good Hope, the Orange Free State, Natal, and the Transvaal) became provinces. This result was achieved largely through the statesmanship of the Boer leaders Louis Botha and Jan Christiaan Smuts (see Smuts).

The Two World Wars

In both world wars the Union was divided politically. In the 1914-18 conflict, while the government sided with Great Britain and its Allies, there was a strong pro-German faction within the Afrikaner element. Union forces, however, aided in clearing the Germans out of their African colonies. As a result, the

Union was given a mandate over South-West Africa.

On the eve of World War II, Smuts was the leader of the United party. The opposition, the Nationalist party, wanted to back Hitler, hoping that if Britain were defeated a South African republic could be formed. However, Smuts brought the Union into the war on the side of the British.

Events After World War II

General Smuts helped form the United Nations. His policy of empire solidarity received a major setback in the election of 1948 with the defeat of his United party by the Nationalists, who pursued a policy of racial segregation (*apartheid*).

Criticism of apartheid led South Africa to withdraw from the Commonwealth and become a republic in 1961. The United Nations censured the South African government for its oppressive racial policy. In 1966 the United Nations ended the country's mandate over South-West Africa (now Namibia), but South Africa illegally retained control of the area.

In the 1970s, when the former Portuguese colonies of Angola and Mozambique became independent black-ruled states, the position of the white-minority government of South Africa—along with that of its neighbor, Rhodesia—became increasingly precarious. Black African governments joined those of the West in condemning the policy of apartheid. And South African blacks began to demand political power. Racial disturbances in black townships were widespread and frequent. In reaction South Africa made some concessions, relaxing discrimination in employment and public facilities, but remained committed to white rule. The granting of independence to four black "homelands"—Transkei, Bophuthatswana, Venda, and Ciskei—was generally viewed as an extension of apartheid. In 1983 a referendum approved a constitutional change conceding limited political power to coloreds and Asians, but none to blacks.

THESE ARTICLES ARE IN THE FACT-INDEX

South Alabama, University of
Southall, Ivan



Rio de Janeiro's harbor, one of the most beautiful in the world, is an outlet for South America's riches. In the foreground is the statue of Christ the Redeemer on Corcovado peak.



SOUTH AMERICA— A Rich and Varied Continent

SOUTH AMERICA. Ever since the discovery of the New World, South America has served as a vast storehouse from which the world has drawn minerals and foods. As the world's needs have changed, South Americans have discovered or produced raw materials to meet them. Europe was greedy for precious metals in the 16th century, and the Spanish conquistadores found gold and silver in the Andes. The Spanish also observed the Andean Indians raising strange new plants, such as potatoes, corn, beans, squash, and pumpkins. These were introduced to a hungry world.

Minerals and Plants for the Industrial Age

The Industrial Revolution multiplied the world's demand for minerals and other products. Wild-rubber gatherers in Brazil's Amazon Basin collected the raw material for tires. Deep pools of petroleum were tapped in Venezuela. In other countries copper, nitrates, tin, lead, zinc, iron ore, manganese, bauxite, and lesser minerals were produced.

The manufacturing nations needed food staples and luxuries. South America, stretching north to south 68 degrees of latitude across the equator and the Tropic of Capricorn into the middle latitudes, had so wide a variety of climates and soils that it could grow almost any crop. Today it harvests and ships most of

the world's coffee and huge cargoes of meat, wheat, cacao, bananas, and sugar.

Over Four Centuries of Achievement

South America was colonized in the 16th, 17th, and 18th centuries by the two maritime powers of Europe's Iberian Peninsula—Portugal and Spain. The Portuguese colonized Brazil, and the Spanish settled elsewhere on the continent. The people won their freedom in the 19th century, and ten independent nations were created. Each developed its unique character and personality, while all retained and enriched the cultures and institutions of the homelands.

South America has long been regarded as a continent of opportunity. It is thinly settled—empty in a large part of its vast interior. It contains land and resources awaiting development.

Obstacles to Progress

The continent has, however, severe obstacles to progress. There are geographic barriers—mountains, swamps, dense forests—and economic, social, and political handicaps. The men who hoe and harvest its crops and mine its ores make only a meager living from their toil. Poverty, ignorance, ill health, and even hunger are widespread. Governments have been un-

stable. The republican principles set up in idealistic constitutions have been largely ignored. Civil wars, military rule, and dictatorships have been frequent.

Today the poverty-stricken people are demanding change. In their frustration and despair they are open to agitation by the agents of Communism, whose activities have multiplied since the Cuban revolution of 1959. Many of the governments have moved toward reform and economic development in recent years. South America's problems have become the free world's problems. Whether reform will bring improvement fast enough to avoid catastrophe is a serious question. To attempt an answer, one must know something of the physical setting of the continent, its climates, its plant and animal life, its people, its commerce, and its history.

Overview of the Continent

South America is fourth in size among the continents and the southern of the two great continents that make up America. With an area of some 6,850,000 square miles, it is about one fourth smaller than North America. The two are somewhat alike in shape—rough triangles, broad in the north and tapering to a narrow tip in the south. They are joined at the Isthmus of Panama. The Atlantic Ocean washes South America's eastern shores; the Caribbean Sea is on the north; and the Pacific Ocean is on the west. Antarctica is to the south. Most of the continent lies east of the United States. Its easternmost hump, in Brazil, projects to within 1,800 miles of the west coast of Africa.

The northern and eastern countries and territories are Colombia, Venezuela, Guyana, Surinam, French Guiana, Brazil, Uruguay, and Argentina. Paraguay and Bolivia are landlocked interior countries. Chile, Peru, and Ecuador are on the Pacific coast. Island possessions off the coasts include the Galápagos (part of Ecuador) and the Juan Fernández group (owned by Chile) in the Pacific and the Falkland Islands (owned by Great Britain but claimed by Argentina) in the Atlantic. Aruba, Curaçao, and Bonaire (Netherlands) and Trinidad and Tobago (British), islands off the Venezuelan coast, are regarded as part of North America.

Physical Features

The arrangement of mountains and lowlands in South America is broadly similar to that of North America. The mountains and lowlands are shown on the elevation map. Along the entire western rim, and branching into four ranges along the Caribbean, rise the towering, rugged Andes. These mountains are part of the Cordilleras

system of the Americas. The Andes create the longest continuous mountain barrier in the world. Geologically they are young, as are the Rockies in North America. (See also Andes.)

On the east are three relatively low areas of uplands, all geologically old and in this respect similar to the Appalachians of eastern North America. They are the Guiana Highlands in the north, the Brazilian Highlands in the center, and the plateau of Patagonia, which occupies nearly all of southern Argentina.

Between these highlands stretch three vast plains, formed millions of years ago by rivers washing soil down from the mountains. The plains are drained



FARMING IN THE SHADOW OF THE VILCANOTA RANGE

The combine seems out of place on the lofty altiplano of Peru. This land was tilled by the farmers of the Inca Empire long before the Spaniards conquered it and settled here. Now it is part of a large hacienda.



A TRADING POST IN THE LONELY AMAZON BASIN

Traders from the almost limitless rain forests along the river bring their wild rubber, nuts, animal pelts, and other products to this settlement. They trade for a few supplies. Housing is flimsy in this hot, rainy climate.

SOUTH AMERICA

by the three large river systems of South America—the Orinoco, the Amazon, and the Paraná-Paraguay. The Orinoco flows into the Atlantic in eastern Venezuela. The broad Amazon reaches the Atlantic along the equator in Brazil. The Paraná and Paraguay rivers join with the Uruguay River in the joint mouth known as the Río de la Plata, which flows into the Atlantic between Argentina and Uruguay. (See also Amazon River; Orinoco River; Plata, Río de la.)

Climates

Ranging over some 68 degrees of latitude, South America has a wide variety of temperature and rainfall conditions. It contains the largest expanse of tropical rainy climate on any continent. In this broad equatorial portion there is little seasonal difference in temperature, and the terms “summer” and “winter” are almost meaningless here.

South of the equator the seasons are the reverse of those in the Northern Hemisphere. Christmas comes during the warmest time of the year, and winter coincides with the summer season in North America.

Ranges of Temperature

Elevation above sea level and latitude both affect temperatures strongly.

Temperature ranges are not as extreme as in North America. In the lowlands near the equator, temperatures are in the 80's the year around. A more or less persistent cloud cover, however, filters the sun's rays and prevents extremely high thermometer readings. Away from the equator, temperature ranges between summer and winter gradually increase. Summers in central and southern Brazil, Paraguay, and northeastern Argentina are hot, but winters are mild and pleasant.

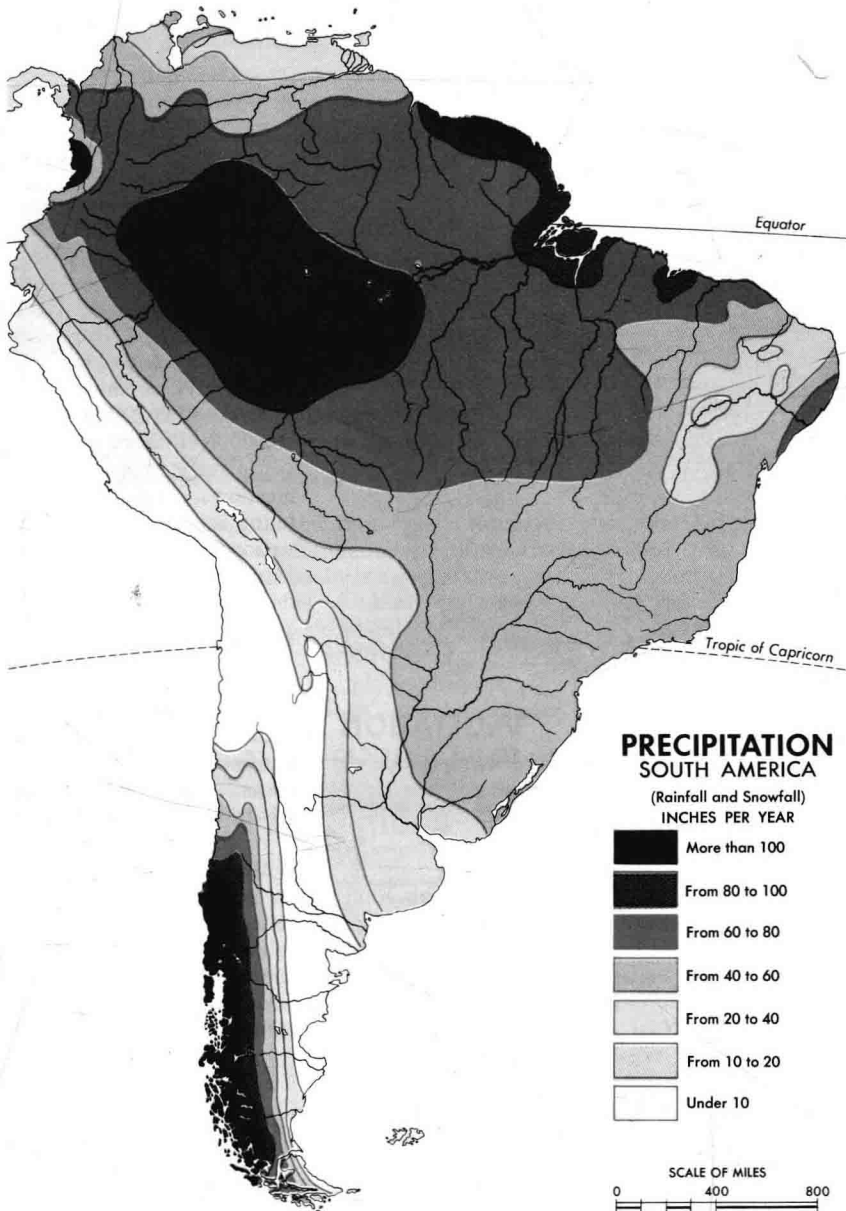
Along the west coast, the cold, north-flowing Peru Current keeps the air relatively cool as far north as southern Ecuador. Southern South America's latitudinal range is much the same as that of the United States. The region, however, does not suffer from



the extreme summer heat and winter cold of the United States Midwest. South America is much narrower here, and the nearer oceans moderate the inland temperatures. The tropical highlands are cooler and pleasanter than the tropical lowlands. Snow lies on the summits of the Andes throughout the year.

Variations in Rainfall

The wide variations in the amount of rainfall, for example from more than 100 inches in the upper Amazon Basin to almost none on the central Pacific coast, are shown on the precipitation map. Mountains, ocean currents, and the wind belts prevailing over the continent play important roles in rainfall and in the occurrence of wet and dry seasons. The continent falls



within a wide range of wind belts—the belt of equatorial calms, or horse latitudes; the trade wind belt; and the westerlies. The belts shift north and south during the year, influenced by the position of the overhead sun. (For map of wind belt positions in summer and winter, *see* Winds.)

Heavy rainfall is brought by the northeast wind to the Guianas and up the Amazon Valley to the eastern slopes of the Andes in Bolivia, Peru, and Ecuador. Moist onshore winds bring the continent's heaviest rainfall to Colombia's Pacific coast. The westerlies carry year-round rains to the southern Chilean coast and winter moisture to Central Chile. Little of this moisture crosses the Andes to Argentina, but cyclonic storms bring rains to the Pampa.

From Central Chile to northern Peru the winds passing over the Peru Current are dry, and the coast and western slopes of the Andes are among the most arid in the World. (*See also* Climate; Rainfall; Weather; articles on the countries.)

Natural Vegetation

The vegetation pattern reflects the pattern of climate. The vegetation map locates eight general types of vegetation.

Areas with year-round heat and heavy rainfall bear the dense growth of the tropical rain forest. This kind of forest is characterized by broadleaf hardwood trees. The trees grow so close together that their crowns touch and intermingle, and little light reaches the floor of the forest. Vines intertwine among the branches. The tropical rain forest is always in leaf, for the trees do not all lose their leaves in the same season.

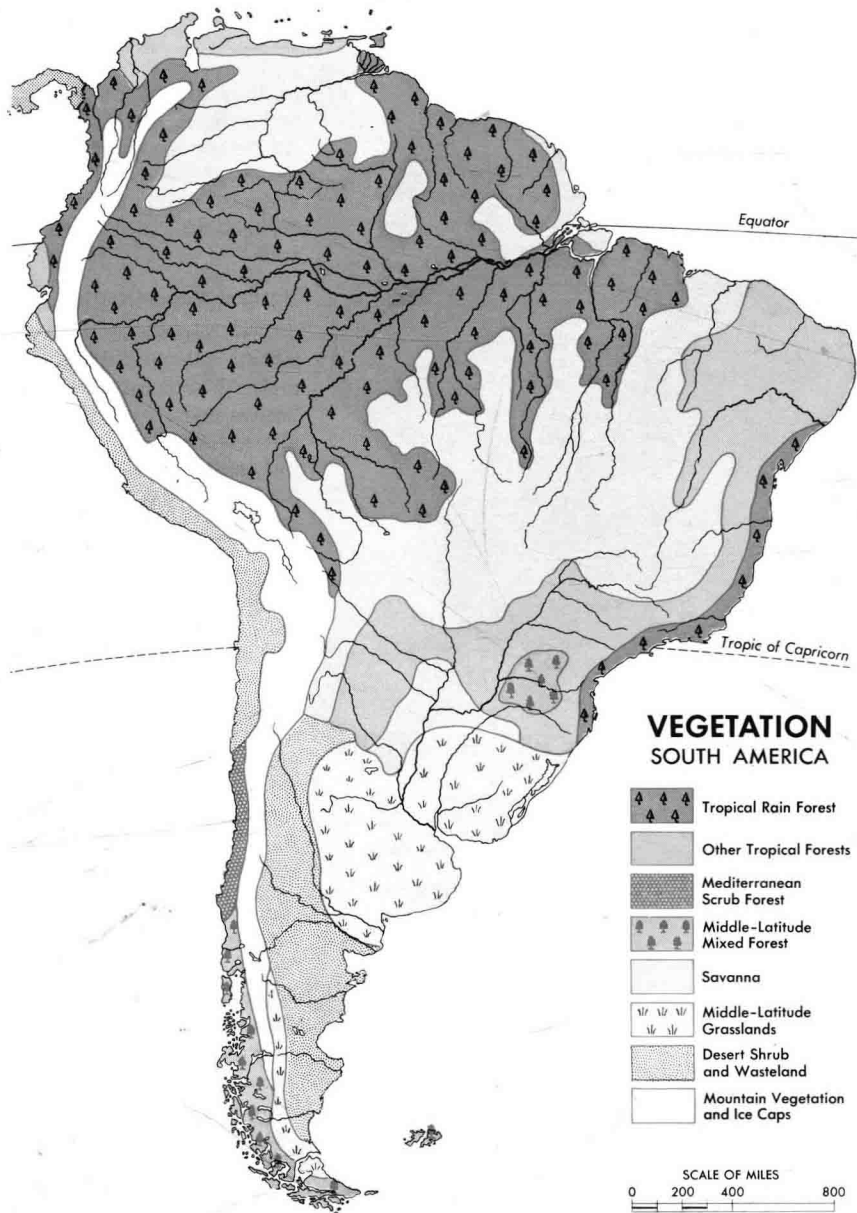
Forests and Grasslands of the Tropics

Tree growth is not so dense where rainfall is less or is seasonal or unreliable. Trees generally shed their leaves during the dry season. Open areas are covered with grass. In areas subject to drought low, scrubby trees grow in response to occasional heavy rains. Less dense forests are mapped as Other Tropical Forests.

A large part of tropical South America is covered by savanna (*see* Grasslands). Tall, coarse savanna grass is adapted to areas where heavy summer rainfall alternates with intense winter drought. It becomes tough, hard, and brown during the dry season. Along streams a more constant supply of water supports trees. The grasslands of the Orinoco Plain are called *llanos*. Those of the Brazilian Highlands are known as *campos*.

Middle-Latitude Forests

In the middle-latitude regions are the Mediterranean scrub forest, the middle-latitude mixed forest,



and the middle-latitude grasslands. The Mediterranean scrub forest grows in Central Chile, where summers are dry and winters moist. Low, widely spaced trees with small, prickly leaves are adapted to withstand the drought.

In southern Chile a middle-latitude mixed forest thrives on the year-round rainfall. Some trees are evergreens. Others, the deciduous trees, lose their leaves in winter. This type of forest also occurs in southeastern Brazil, in eastern Paraguay, and in northern Argentina.

Lush Prairies, Deserts, and Ice Caps

The prairies of the Argentine Pampa, Uruguay, and the tip of southern Brazil are the largest area of

middle-latitude grassland. Much of this region has been grazed and plowed for so long that few areas of tall natural grass remain.

The vegetation pattern in the Northern and Central Andes varies according to elevation, latitude, and rainfall. Rain forests cover the eastern slopes. Desert shrub and wasteland characterize the arid western slopes of the Central Andes. Where summits in the tropical areas rise above 10,000 feet there are subarctic evergreens and arctic meadows. Ice caps are found at the greatest elevations. Much of the plateau of Patagonia also bears desert shrub.

Plants and Animals

Many of man's most useful plants are native to South America. Some were domesticated by the Indians. After the continent was discovered the plants were spread to other parts of the world. Among them are potatoes, tomatoes, peanuts, cacao, cassava, coca, tobacco, yerba maté, cinchona, and quebracho. (See also Indians, American, picture map in color "The American Indian and His Gifts to the World"; Plants, Domestication of.)

Also native to South America are many animals. In its tropical rain forests are mammals, such as jag-

uars, sloths, giant anteaters, howler monkeys, kinkajous, guinea pigs, and capybaras, the world's largest rodents. Tapir live in both the lowland forests and on high mountain slopes, and armadillos range all over the continent. Chinchillas live in the Andes, as do the camellike llamas, alpacas, vicuñas, and guanacos.

Birds, Fish, and Reptiles

Birds are especially numerous. In the tropical rain forests are trogons, motmots, toucans, tanagers, spectacled owls, jacanas, sun grebes, hoatzins, curassows, harpy eagles, king vultures, and macaws and other parrots. Jabirus, lined tiger herons, scarlet ibises, and black-necked swans are tropical wading