

# REDISCOVERING HAWAII

Produced by the Cartographic Division



NATIONAL GEOGRAPHIC SOCIETY

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Washington, D.C., September 1995



Growing as tall as 30 feet, the Punaluu hibiscus brightens Oahu's stream banks.

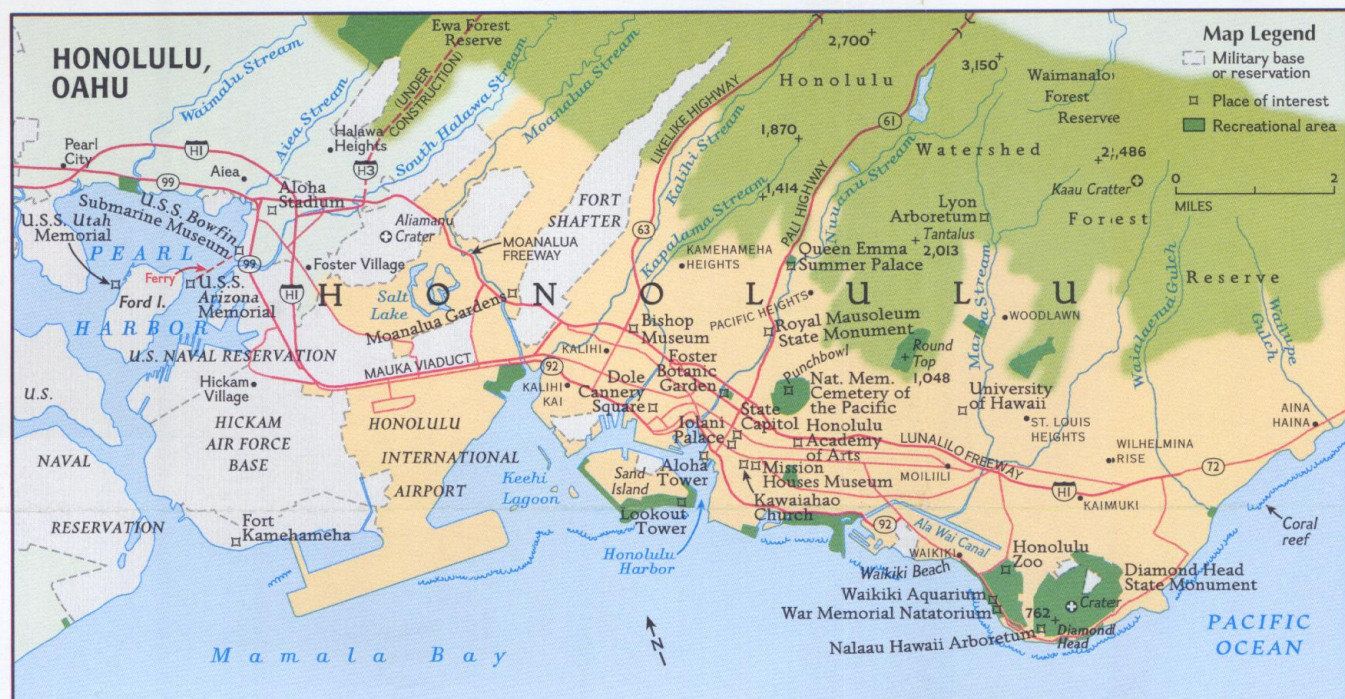
One of more than 50 species of honeycreepers endemic to Hawaii, the 'Iiwi wears brilliant feathers that once adorned the cloaks of Hawaiian royalty.

Named for its cylindrical spines, the slate pencil sea urchin dazzles snorkelers with its starburst of color.

## Molten Earth to Modern Cities

**L**URED BY IMAGES of gilded beaches, plush golf courses, and fantasy resorts, nearly seven million visitors a year come to Hawaii for a dose of its soothing tropical therapy. Yet there's more here than big surf and swaying palm trees. Though only slightly larger than Connecticut, the state encompasses an array of landscapes from steaming lava fields to snow-crowned peaks. Beyond the resort-strewn coast the land is resonant with history and rich in endemic flora and fauna, harboring at least 8,800 kinds of plants and animals found nowhere else on earth.

This natural diversity is mirrored in the kaleidoscopic makeup of Hawaii's 1.2 million people, less than 20 percent of whom claim Hawaiian ancestry. Yet despite the welter of foreign influences, native culture is experiencing a renaissance: A growing grassroots movement is seeking some form of sovereignty for native Hawaiians. If approved by plebiscite, a state constitutional convention will decide what form sovereignty should take.



### Historic Lahaina

Steeped in history and the nautical flavor of a 19th-century Hawaiian seaport, the town of Lahaina on Maui's western shore has been reincarnated in several forms over the past two centuries. Lahaina served as capital of the Kingdom of Hawaii from 1837 to 1845. Whalers and missionaries had arrived in the 1820s, setting the stage for a longstanding feud that at times flared

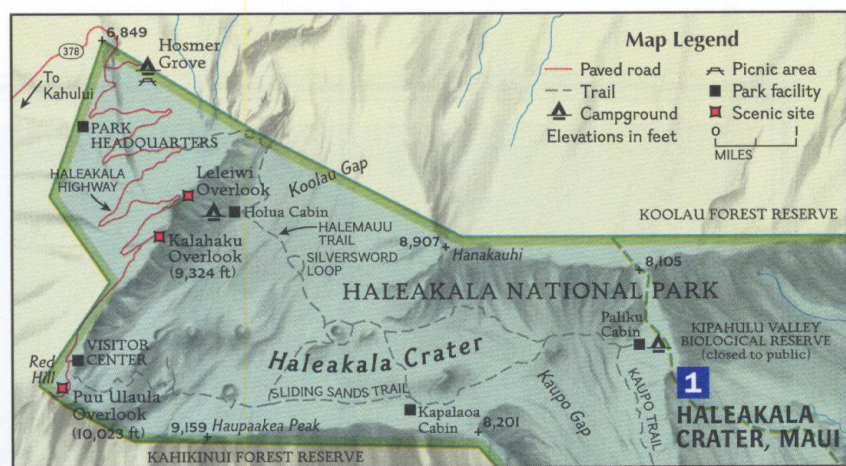
into violence. Distressed to find grog shops and brothels lining Lahaina's streets, the clergyman persuaded the Hawaiian governor of Maui to outlaw "ardent spirits" and forbid island women to visit ships. Outraged by the new strictures, whalers rioted. The conflict reached a crescendo in 1827 when incensed seamen whistled cannonballs at the mission house before sailing for less inhospitable Honolulu.

With the decline of American whaling in the late 1800s, a rollicking era came to a close, and Lahaina faded into a drowsy sugar town. Reawakened during the 1960s by resort development and a surge in tourism, the seaside village has taken pains to preserve its past. Today nearly the entire town is a national historic landmark. Though chockablock with restaurants and trendy shops, the old, authentic Lahaina shines through at places like the Baldwin Home Museum, the restored homestead of medical missionary Dwight Baldwin, and aboard the *Carthaginian II*, a floating museum dedicated to whaling. From December through May, whale-watching excursions depart Lahaina harbor.

### Honolulu's Cultural Cauldron

Home to nearly a third of the state's population, Honolulu is the place to behold the human face of modern Hawaii. More than 60 percent of the state's citizens are of Asian or Pacific Island ancestry, and visitors strolling the streets of this casual, cosmopolitan metropolis overhear conversations in Japanese and Chinese as well as English. Menus reflect an ethnic smorgasbord: Even McDonald's restaurants offer Oriental noodles and spicy Portuguese sausage.

Yet Honolulu also preserves Hawaii's Polynesian heritage. Stateli Iolani Palace, capital of the last Hawaiian monarchs and the only royal palace on U.S. soil, has been carefully restored. The Bishop Museum houses the world's largest collection of Hawaiian artifacts.



### HALEAKALA CRATER

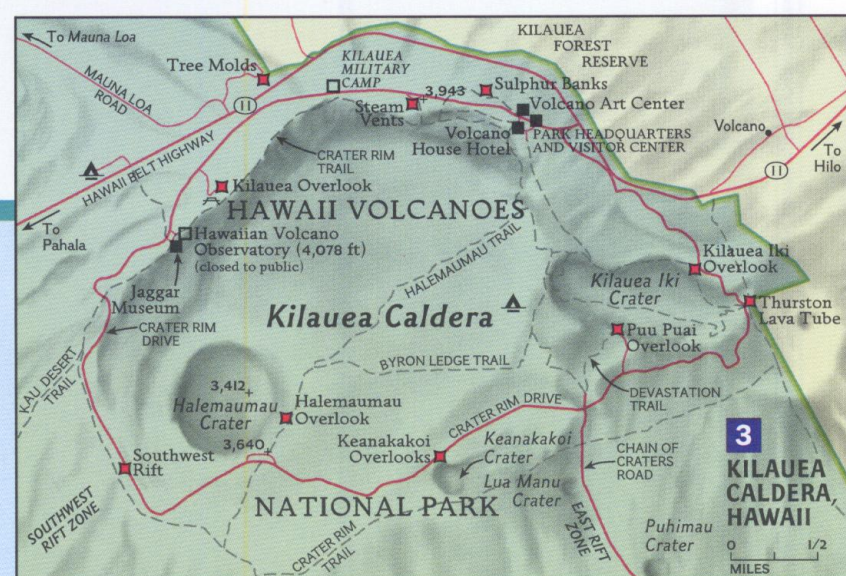
**1** A basin big enough to hold Manhattan tops the list of attractions at Haleakala National Park (above) on Maui. Misnamed a crater, the 12,160-acre, 2,720-foot-deep bowl formed as erosion ate away the mountain, joining two valleys. The depression's lunar landscape contrasts sharply with the lush rain forest seen elsewhere in this 28,655-acre park.

### KAUAI STATE PARKS

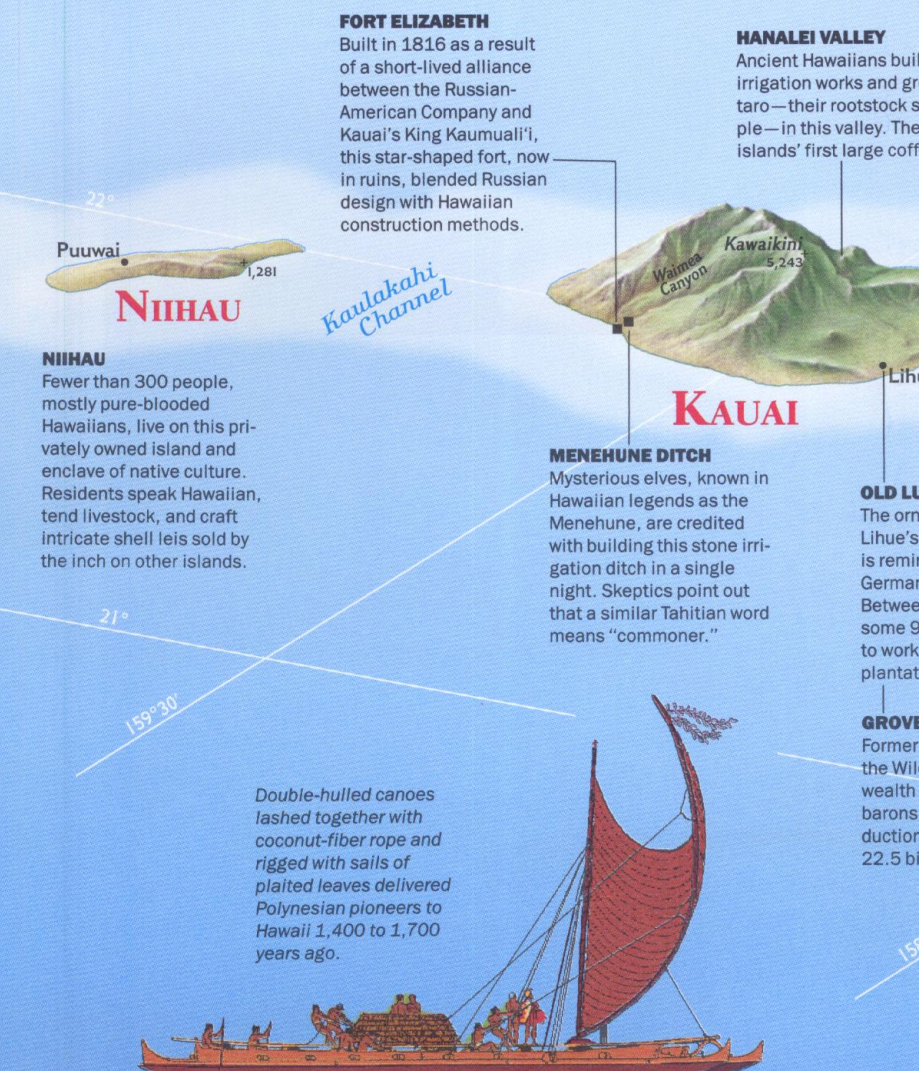
**2** Jaw-dropping scenery embellishes a trio of parks on Kauai (left). Waimea Canyon, often described as the Grand Canyon of the Pacific, reveals the island's lava-layered basement. By contrast, Kokee State Park affords rooftop views. At Na Pali Coast State Park, knife-edged pail (cliffs) tower 2,000 feet above a remote stretch of shore.

### KILAUEA CALDERA

**3** Nicknamed the "drive-in volcano" because of easy access and relative safety, Kilauea simmers inside Hawaii Volcanoes National Park (below) on the island of Hawaii. Crater Rim Drive runs 11 miles around the caldera, an oval depression measuring 2.5 by 2 miles. Kilauea has drawn more than 24 million visitors since its latest, ongoing eruption began in 1983.



## Exploring Hawaii's Heritage



### Charting the Course of Change

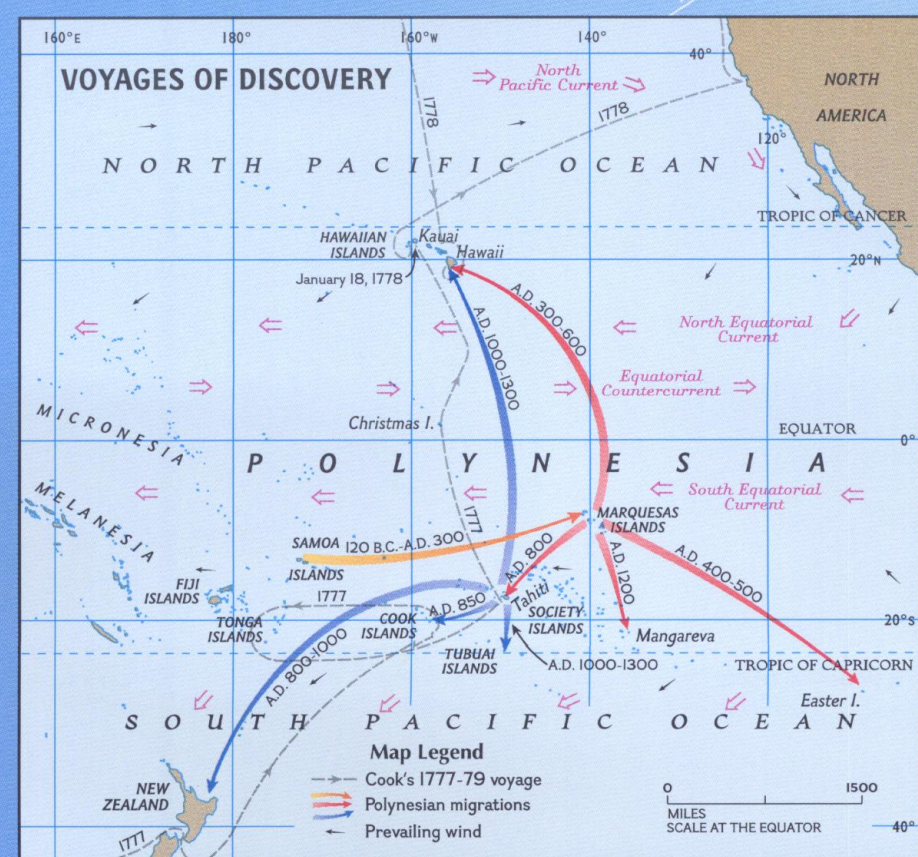
Without compass or chart, guided solely by their senses and their keen knowledge of stars, currents, winds, and the flight of birds, Polynesian mariners became masters of a realm spanning 14 million square miles of ocean stippled with islands. In more than ten centuries of seafaring they ventured from Samoa to the Marquesas Islands, then struck out in all directions: southwest as far as New Zealand, southeast to Easter Island, and north to the Pacific's farthest outpost, Hawaii.

Departing the Marquesas 1,400 to 1,700 years ago, Hawaii's first inhabitants arrived in double-hulled canoes laden with staples that included breadfruit, sweet potatoes, pigs, fowl, and barkless dogs bred for food.

The first Hawaiians built a highly stratified society that reached its apex under Kamehameha the Great, the famed warrior-king who consolidated the islands' warring, feudal-like chiefdoms into a single monarchy in 1810. Polynesian Hawaii's golden era would be shortlived, however, for an invasion of outsiders had already begun.

Sailing from the Society Islands to North America, English navigator Capt. James Cook happened upon a group of islands in January 1778 "which the natives call Owhyhee." It was a fateful encounter. In the next 75 years foreign ships would deliver missionaries seeking souls and whalers seeking fortunes. The white man's diseases would wither the population of native Hawaiians from the 300,000 estimated by Cook to barely 71,000 counted during the 1853 census.

Laws passed in 1850 allowing foreigners to own land and import contract laborers ushered in an era of immigration and plantation agriculture that transformed both Hawaii's landscape and its people. By 1893 American sugar barons wielded such power that they deposed the Hawaiian monarch in a near-bloodless coup. Seven years later Hawaii became a U.S. territory. Statehood was gained in 1959, following a massive influx of Americans during World War II. With the coming of the jet age during the 1960s, the nation's newest state became one of the globe's favorite vacation getaways.



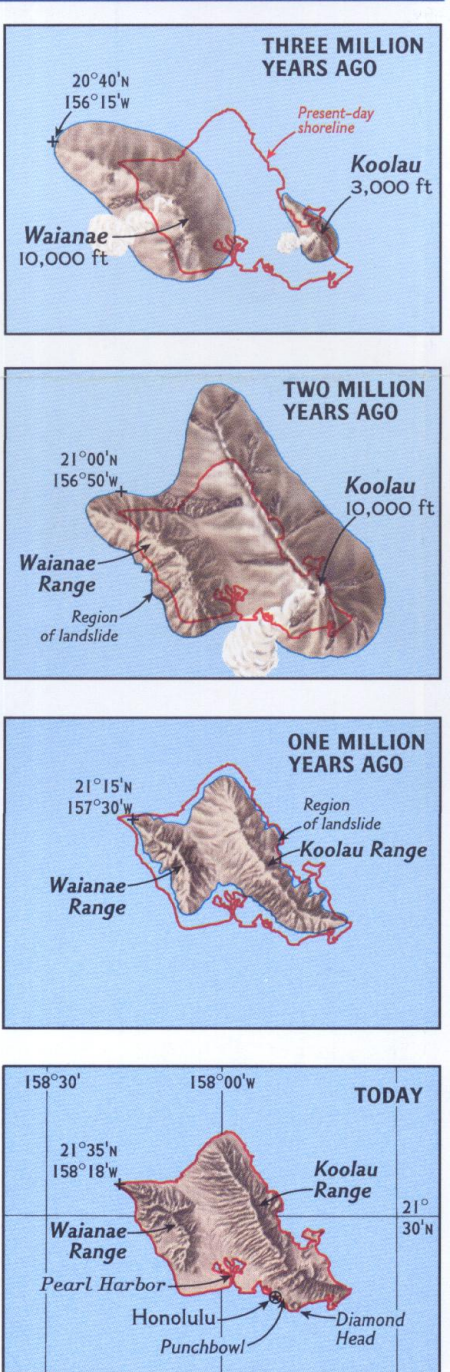
### OAHU'S ODYSSEY

**Three million years ago:** Oahu's volcanic ancestors are centered over a plume of magma, or hot spot, that fuels island-making eruptions. Koolau, which only recently breached the sea's surface, will grow into a massive, elongated monolith similar in profile to a warrior's shield—the so-called shield volcano typical of the Hawaiian chain. Waianae, already a million years old, will soon cease erupting. Both islands are being borne northwestward on the Pacific plate at about 53 miles per million years.

**Two million years ago:** Arriving at the trailing edge of the hot spot, Koolau remains active, but Waianae has long since run out of steam. Slumping has loomed off much of its western side, and streams carve its slopes. Lava from the younger volcano has filled the gulf between the mountains, forming a single island. Repeated outpourings of magma have caused Koolau's summit to collapse into a cliff-rimmed basin, or caldera.

**One million years ago:** Koolau's eruptions have sputtered to a halt, but the aging volcano goes out with a splash. Ground unstable under the build-up of lava on its slopes, the mountain's eastern flank sheers off in a sudden, cataclysmic landslide that strews debris nearly 150 miles offshore. The huge sea-floor debris field includes some individual chunks the size of Manhattan Island. The collapse leaves behind spectacular 2,000-foot-high cliffs.

**Today:** Now 220 miles from its birthplace, modern-day Oahu is beyond the reach of the furnace that powered its now extinct volcanoes. Yet violent eruptions remain a possibility elsewhere on the island. Following a long period of quiescence, some 40 secondary eruptions have occurred during the past 600,000 years. Many of Oahu's most distinctive landmarks, including Diamond Head and Punchbowl crater, were formed by these latter-day eruptions.



### Hawaii's Fiery Wellspring

Deep beneath the island of Hawaii seethes a volcano-making machine geologists call a hot spot. Over the past 44 million years it has churned out 82 volcanoes that today form the Hawaiian Ridge.

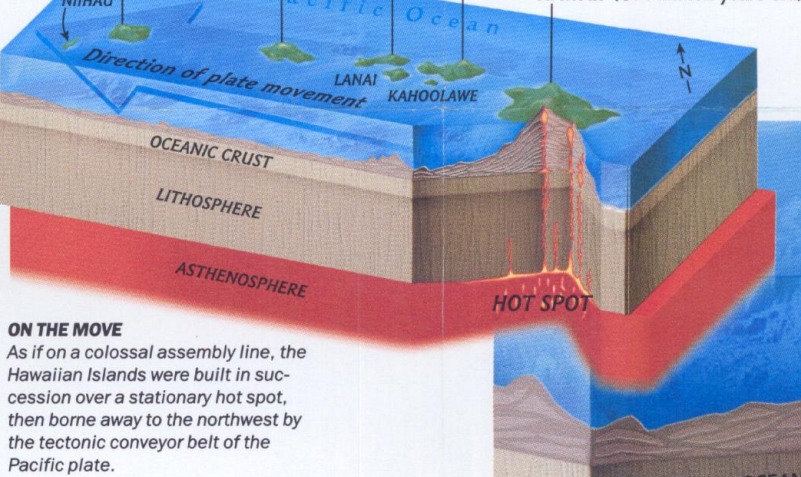
Hawaii, the archipelago's youngest island, is still under construction. Two of the world's most active volcanoes—Kilauea and Mauna Loa—frequently add new acreage and pave over existing real estate. Twenty miles offshore, a third volcano fired by the same hot spot is giving birth to the chain's next member, Loihi.

The source of raw material for this age-old construction project lies more than 50 miles underground within a layer of the earth's mantle called the asthenosphere. Here, rock kept in a plastic state by heat and pressure continuously rises, cools, and sinks—much like boiling water convecting in a pot, only at a rate slower than the growth of a human hair. Where rising currents bring up heat from deep within the earth, mantle material melts into pods of magma. Lighter than the surrounding rock, they rise toward the surface.

Until recently the hot spot was depicted as a pipeline conduit. Geologists now believe that when upwelling

## Islands Under Construction

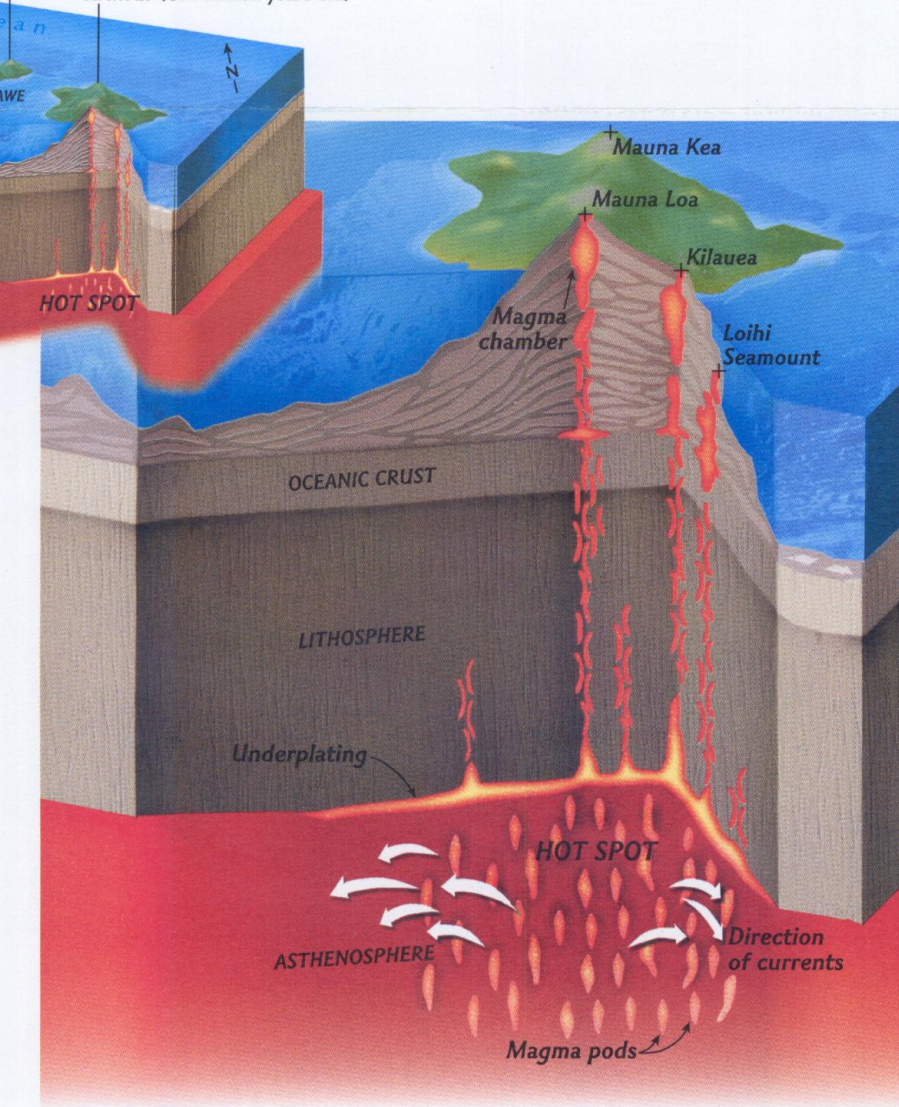
KAUAI (5.1 million years old)  
OAHU (3.7 million years old)  
MOLOKAI (1.8 million years old)  
MAUI (0.8 million years old)  
HAWAII (0.4 million years old)



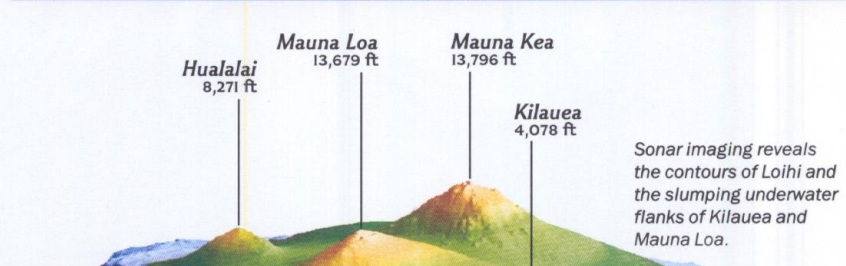
**ON THE MOVE**  
As if on a colossal assembly line, the Hawaiian Islands were built in succession over a stationary hot spot, then borne away to the northwest by the tectonic conveyor belt of the Pacific plate.

magma strikes the lithosphere—earth's rigid rind—it fans out, perhaps as far as 200 miles, a phenomenon called underplating. From there it gradually rises through a honeycomb of fissures and then accumulates in huge magma chambers a few miles below the volcanic summits.

When mounting pressure again pushes the magma toward the surface, molten rock may erupt at the summit or move laterally through rifts along the volcano's flanks. Unlike temperamental volcanoes that blow their tops, Hawaii's peaks effuse lava in spectacular but relatively harmless fountains. The ooze builds huge, rounded mountains by slow accretion rather than creating steep, cone-shaped volcanoes typically forged by violent blasts.



### THE RISE AND FALL OF VOLCANIC ISLANDS



**Twenty miles** off the southeast coast of Hawaii, an embryonic island named Loihi is growing in womble darkness. Discovered in 1955, this upstart volcano was for many years presumed to be an ancient, inactive seamount. Then, a swarm of undersea earthquakes during the early 1970s caused scientists to suspect an active volcano was brewing offshore. Seafloor photographs and dredge samples collected a decade later removed all doubt. Today the burgeoning seamount is recognized as the youngest volcano in the Hawaiian chain. Measuring 16 miles long and 8 miles wide, the infant Loihi must grow another 3,180 feet before it will emerge from the waves—60,000 years from now.

**As Loihi bulks up,** its older neighbors have begun falling apart. "The entire south flank of Kilauea is peeling off into the sea," says geologist John Sinton of the University of Hawaii. Satellite measurements confirm that the flank is creeping seaward several inches a year. In 1975 it lurched 20 feet after being jolted by an earthquake, triggering a local tsunami that miraculously claimed only two lives. A deadlier paroxysm in 1868 swept away entire villages along Hawaii's south coast. Such cataclysms, say scientists, are an integral part of a volcano's evolution.

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