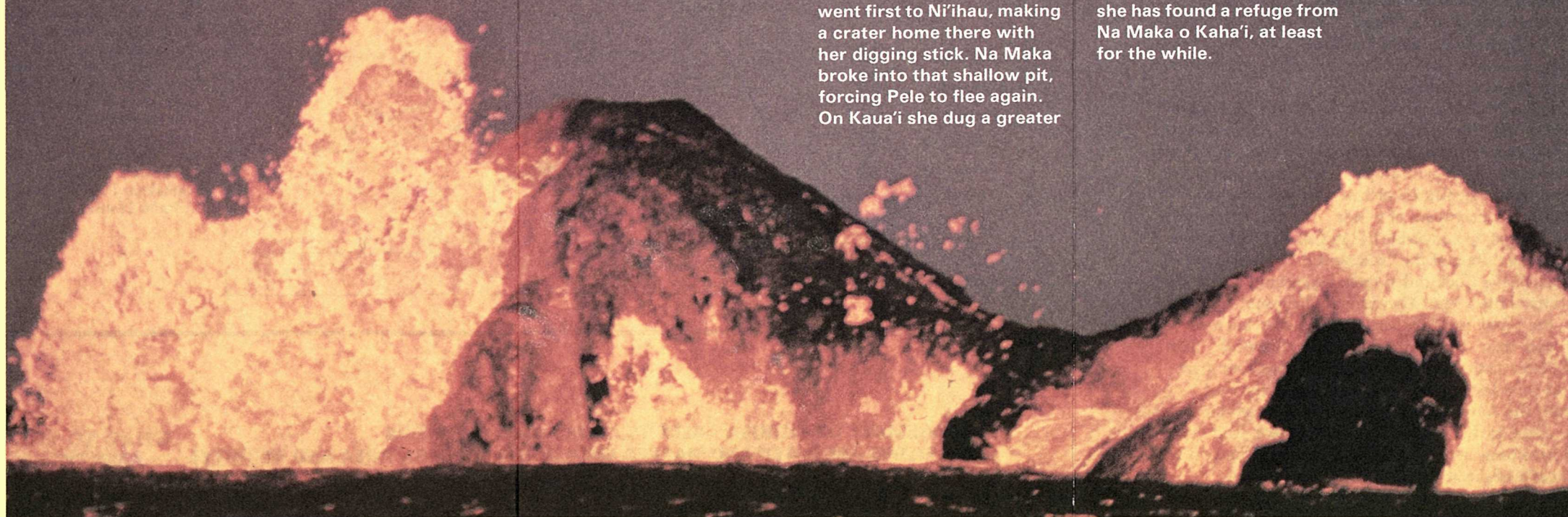


Hawaii Volcanoes National Park



*E Pele e!
O Goddess of the burning stones,
Life for me. Life for you.
The flowers of fire wave gently,
Here is your offering. . .*



FIERY ISLANDS IN THE SEA

The Hawaiians of old told many myths and stories about their homeland, and the myth recounted above is just one of many about Pele, the volcano goddess. The early storytellers were fine poets, perceptive observers of people, and excellent students of nature. They were aware of many things about their islands that are being explained today by modern research methods. Their account of the succession of Pele's homes, for example, agrees with the relative ages assigned to the islands by geologists—Ni'ihau and Kaua'i are indeed the oldest, the island of Hawai'i is certainly the youngest. But now geologists and volcanologists can tell us facts that the original Hawaiians would have had no way of knowing. By including shoals and atolls between Ni'ihau and Ocean Island, the Hawaiian Chain has been extended far beyond the limits known to its first inhabitants. And volcanologists have increased our understanding of the manner in which these islands were made.

The fires begin—The islands in the Hawaiian archipelago are only the very tops of immense mountains that have been built up from the bottom of the sea during the last 25 million years. They have been created by eruptions of molten rock forced up from earth's mantle through fractures in the planet's thin crust, which here is serving as the floor of the ocean.

Beneath this region, in earth's mantle, a deep-seated source of heat melts the rocks around it. This fluid rock, called magma, then rises through the overlying crust to produce the volcanoes. Magma that flows from volcanoes over the surface of the earth is called lava.

A mountain arises—At first, the lava escaping through volcanic vents in the crust flowed out upon the ocean floor. Gradually, as magma continued to rise from the mantle, successive eruptions of lava built up a submarine mountain around each vent. As layer upon layer of lava was deposited, the volcano grew broader and higher, until eventually it rose far above the surface of the sea. This type of volcano with rather gentle slopes is called a shield volcano.

As long as the conduits that feed magma into a shield volcano can receive fresh supplies of melted rock, the



LAVA—PAHOEHOE

Hawaiian volcanoes release lava in two different physical forms—different in appearance, but identical in chemical composition. Most lava is erupted as pahoehoe. When a pahoehoe flow solidifies, its surface is black and relatively smooth. (No wonder pahoehoe was the name Hawaiians gave to black satin material when they first saw it!) Generally, because of the way this kind of lava flows and cools, the smooth surface is interrupted by wrinkles, billows, rope-like coils, and other deformations.

mountain will continue to grow. But the Hawaiian Islands rest upon a portion of earth's crust known as the Pacific Plate, and this plate is moving slowly toward the northwest, at the rate of 5 to 8 centimeters (2 to 3 inches) each year.

The fire dies—Because of this movement, contact between the source of magma and the conduits within the volcano cannot be maintained. After a time, that contact is kept only with difficulty, and in a sense, the mountain is starved to death, gradually perhaps, but inexorably. Surface eruptions of lava occur less frequently after contact is broken, and the volcano may remain dormant for long

This is Pele's domain. Pele, a daughter of Haumea the Earth Mother and Wakea the Sky Father, is the goddess of fire, the maker of mountains, melter of rocks, eater of forests, and burner of lands—creator and destroyer both in one. She appears among mortal men sometimes as a beautiful young woman, tempting them, oftener as a wrinkled old hag, testing them. Whatever form she

takes, Pele is unpredictable and tempestuous, as only a proud and jealous female can be. She does not ask for love. She demands respect. Here you must "step lightly, for you are on holy ground," the Hawaiians said in days of old.

The myth makers said that Pele came to the Hawaiian Islands long ago, in flight from a cruel older sister, the goddess of the sea, Na Maka o Kaha'i. Pele went first to Ni'ihau, making a crater home there with her digging stick. Na Maka broke into that shallow pit, forcing Pele to flee again. On Kaua'i she dug a greater

house. Na Maka chased her away from there too. And so the pursued Pele ran, from place to place, from O'ahu to Moloka'i, to Lana'i, to Kaho'olawe, Molokini, and Maui, each in turn; and from each successive home, the unrelenting Na Maka drove her out. At length, weary of being so harried, Pele dug deep and built high on the island of Hawai'i. Here, at last, in these huge fortress-mountains, she has found a refuge from Na Maka o Kaha'i, at least for the while.

intervals. Ultimately, the volcano ceases to grow: it becomes extinct.

At present, the volcanic mountains Kilauea and Mauna Loa here on the island of Hawai'i are linked most directly to the source of magma beneath the Pacific Plate. The other mountains in the Hawaiian chain have been carried beyond their sources of supply. As a result, some are extinct, such as those farthest to the northwest: like a slow-moving assembly line, the Pacific Plate has carried them away from the foundry that made them. Those at the southeastern end—especially Haleakala, Mauna Kea, and Hualalai—are dormant, awaiting the time when magma might rise within them and lava will flow again from their vents.

The mountain retreats into the sea—The oldest, northwesternmost islands have died long since, worn away by the action of the ocean through which they rose. The sea has claimed their bodies, and soon it will roll over their heads. Their successors, too, are doomed to this same fate.

Many forces have destroyed those older islands. Even while they were growing, their own immense weight caused the ocean floor to sag under them, and they began to sink. While that slow subsidence was happening, the agencies of erosion attacked the parts standing above the surface of the sea: scouring wind, rains, streams, and ocean waves cut down the mountains, leveled the cliffs, stole the soil, ate away the islands' very bones. Because volcanic activity had ended, no new deposits of lava replaced the parts that had been worn away. Today, for such an island nothing is left above the sea except perhaps an atoll; the volcanic island has drowned, leaving only a lei of reef and sand as its memorial, seeming to float upon the waves of the conquering sea.

The younger islands in the Hawaiian chain still hold heads and shoulders high above the water. Yet for them, too, the processes of dying have begun. In the course of implacable time, all these islands will disappear into the sea. Na Maka o Kaha'i will triumph in the end. Surely this must be one of the greatest causes of Pele's rage.

HAWAII—THE BIG ISLAND

By far the largest island in the archipelago, Hawai'i is also one of earth's most prodigious volcanic constructions. The ocean floor lies more than 5,500 meters (18,000 feet) below its beaches; the highest point on Mauna Kea is 4,205 meters (13,796 feet) above sea level; and Mauna Loa is 4,159 meters (13,667 feet) high. Measured from the ocean floor, these shield volcanoes are considered to be the greatest mountain masses on earth. Geologists also tell us that it took Mauna Loa about 3 million years to attain its size: 2 million to reach the surface of the ocean and perhaps another million to make that vast mound of stone now visible above sea level.

Although Mauna Loa appears to be so much bigger, Kilauea is an impressive shield volcano in its own right. It rises about 6,700 meters (22,000 feet) above the ocean floor; its height above sea level is slightly more than 1,200 meters (4,000 feet). Both are counted among earth's most active volcanoes.

Kilauea's activity is evident almost everywhere within the bounds of this park. Recently, its most frequent and spectacular displays have been presented along the east rift zone. Sometimes magma pushes its way through lateral conduits and flows from vents in a volcano's sides instead of in its summit crater—usually along the structural weaknesses in a shield volcano known as rift zones. Kilauea has two such rift zones. One extends from the caldera toward the southwest, through Ka'u. The other, which includes the Chain of Craters, extends east-northeast through Puna,

past Cape Kumakahi and into the sea beyond. Several eruptions have occurred in the summit crater of Halemau-mau also, and a few have broken out along the southwest rift zone extending into Ka'u.

Since 1969 repeated eruptions have created a new parasitic lava shield in Mauna Ulu, "Growing Mountain," on the east rift zone. In the first 5 years of its existence, Mauna Ulu's vents poured out enough lava to fill up two pit craters; to build a new lava shield 122 meters (400 feet) above the level of the surrounding area; to bury or block off 19 kilometers (12 miles) of park road—burying some sections of it under more than 90 meters (300 feet) of rock; to cover 4,050 hectares (10,000 acres) of park land; and, where the flows entered the ocean, to add about 80 hectares (200 acres) to the island's area.

Active though they are, Hawai'i's volcanoes are relatively gentle. Violent outbursts—characterized by tremendous explosions, destructive earthquakes, clouds of poisonous gases, showers of hot mud, and rains of erupted rocks—have occurred only twice in recorded history. Both happened at Kilauea, one about 1790, the other in 1924.

The eruption of 1924 seems to have been caused by the build-up of great steam pressure, generated when ground water came in contact with hot rocks below the caldera. The steam pressure blew out a great part of the volcanic conduit's plug of solidified rock, scattering stones and other debris for several kilometers. The explosion enlarged the diameter of Halemau-mau from about 360 meters (1,200 feet) to about 900 meters (3,000 feet), and left a hole some 400 meters (1,300 feet) deep.

In general, however, Kilauea's eruptions are mild, and by far the greatest part of the material it releases appears in the form of slowly moving lava flows. The lava, gases, and cinders issuing from the vents can be dangerous, of course. Lava flows have destroyed forests, crops, houses, and other property, even villages, on occasion.

And beyond any doubt, Pele can be capricious. In the past, before scientists learned enough about her behavior, she would pop up in unpredictable places at most unexpected times. Now, however, they know enough about her humors to be able to anticipate most, if not all, of those fiery tantrums.

Even so, geologists, who regard earth processes in terms of eons, are understandably reluctant to predict the near



LAVA—'A'A

'A'a is the form of lava that solidifies in a jumble of relatively small clinker-like rocks having extremely rough surfaces. Pahoehoe lava emerging from a vent may change to 'a'a even while the flow is still moving: as the temperature and gas content of the pahoehoes are reduced, the lava becomes more viscous and congeals as 'a'a.

future. Some have ventured to say, however, that before volcanic activity on Hawai'i Island ends, the entire surface of Mauna Loa and Kilauea will be covered again, at least once, with fresh lava.

And oceanographers have found evidence suggesting that someday Pele may abandon her present homes completely. She has built many mountains upon the ocean's floor to the southeast. One such seamont is already about 4,600 meters (15,000 feet) high. If ever she lifts any of these above the surface of the waves, beyond the reach of vindictive Na Maka o Kaha'i, who can tell what new monument to herself Pele may not build?



The willow (above, top) is a typical lowland forest tree, one of the few in Hawai'i that lose their leaves each year.

Kilauea Iki trail crosses the floor of Kilauea Iki Crater (above), where still-molten lava lies under your feet beneath the surface.

Recently active Mauna Ulu (left) created a new shield on the east rift of Kilauea that you can see from the Chain of Craters Road.

LAVA TUBES

Lava tubes (left and below) are made when a crust forms over the surface of a pahoehoe flow. The crust cools, thickens, and stops moving, while the core of lava beneath still advances downhill. When the fluid lava drains away, a cavity remains that resembles a tunnel, often with a flat floor and an arched ceiling. Most lava tubes are short and shallow, being little more than vaults, but some are 9 to 15 meters (30 to 50 feet) high and several kilometers long. Thurston lava tube in the park is a modest example compared with those that have been found near Hilo and in recent flows from Mauna Ulu.



ERUPTION BULLETINS

You can get up-to-date information about on-going eruptions or potential activity by calling (808) 967-7977 day or night. The automatic answering service is updated whenever Kilauea or Mauna Loa show signs of change.

Because eruptions are the most exciting events at Hawaii Volcanoes, temporary road signs will direct you to access or vantage points where you can confront the power of these events when conditions are safe.

FOR YOUR SAFETY

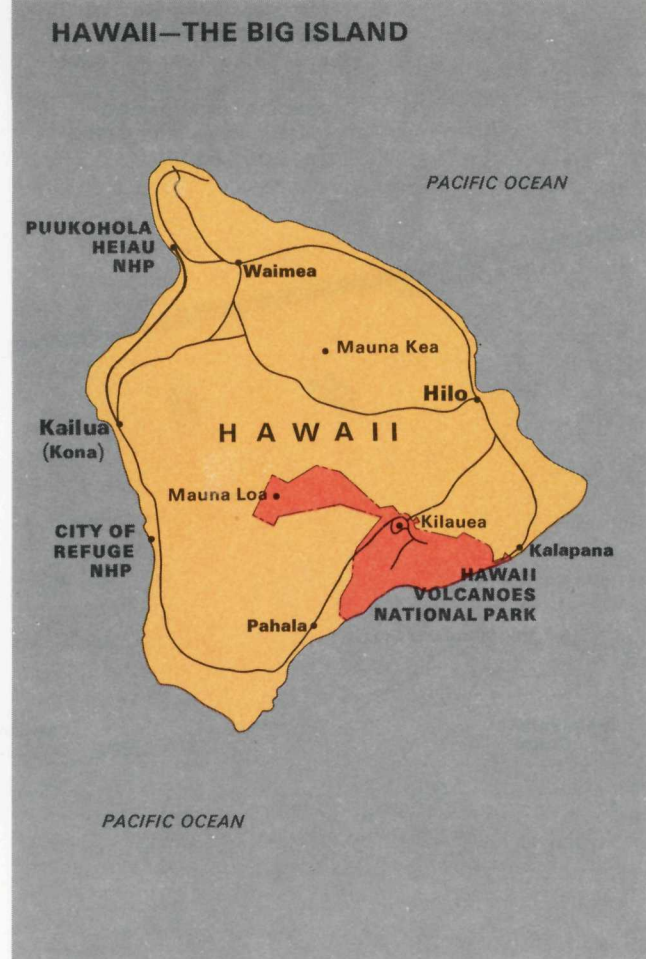
Be aware of these special hazards at Hawaii Volcanoes.

Please stay on trails. The surface of Kilauea is laced with deep cracks, and many of these are hidden by vegetation. Recent lava flows are shelly and collapse easily.

Fumes from volcanoes can compound respiratory problems. If in doubt, heed the warning signs.

A number of trails lie along the edges of cliff tops, so keep children under control.

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ADMINISTRATION

Hawaii Volcanoes National Park is administered by the National Park Service, U.S. Department of the Interior. A superintendent, whose address is Hawaii Volcanoes National Park, HI 96718, is in immediate charge. His offices are at park headquarters, Hilo entrance.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and

water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department also assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation Communities and for people who live in Island Territories under U.S. administration.

SEAFARERS FIND THE ISLANDS

Pele may well have been one of the deities who helped the first Hawaiians to find these islands. The gods of all seafarers aided the wanderers—those in the sun, the moon, the stars, those in the winds, clouds, ocean currents, even in the wreck of the sea and the birds of the air. But as they neared the island of Hawai'i, after weeks of sailing across the uncharted sea, Pele could have been the one that attracted them, for the glow from her fires, burning like beacons atop Mauna Loa and Kilauea can be seen for many kilometers out to sea. Even if Pele happened to be sleeping when a canoe approached from the south, the huge mountains she had raised would have guided those first Hawaiians home.

They came from islands to the south—Archeologists have concluded that those discoverers came from central Polynesia, probably from the Marquesas Islands, about 1,200 years ago. The voyagers had sailed across more than 3,800 kilometers (2,400 miles) of open sea, not certain that they would ever reach a saving shore. A group numbering as many as 50 men, women, and children may have made the voyage, living aboard a great double canoe.

For them to have discovered Hawai'i was feat enough. To have survived the difficult years after they landed upon these inhospitable coasts was an even greater achievement. For this would have been a most grudging land, offering them little more than a refuge from the sea and fresh water to drink. It would have given them little to eat, except a few kinds of fern fronds and roots, bitter and tough, a few kinds of birds not easily trapped. The ocean was kinder: it kept them alive during the years that passed before the food plants and animals brought from the homeland could supplement the fare they pulled from the sea.

The islands bore distinctive flora and fauna—Though lacking in edible plants, the islands they had found were not utterly barren. Despite their isolation from other Pacific islands and the continents, Hawai'i's volcanic moun-

PUKIAWE

Although they look good enough to eat, the bright, attractive fruits of the pukiawe are inedible. Instead, the colorful berries—sometimes white, pink, red or mahogany brown—have been used to make leis. You're most likely to see this hardy shrub along dry ridges, at both high and low elevations.



'ELEPAIO

This dainty little wrenlike bird, called 'elepaio, is one of the friendliest natives in the park. A member of the Old World flycatcher family, it lives on insects found on tree leaves and stems and builds its deep nest out of lichens held together with cobwebs.



tains had acquired an amazing number and variety of plants and animals—with the exception of mammals. Only bats and seals preceded man to these islands.

How had this distinctive life on the islands developed? Almost as soon as the growing shield volcanoes appeared above sea level, seeds or spores or eggs of living creatures or the complete organisms themselves were carried here by ocean currents, high winds, or far-flying birds. Very few of those hapless migrants survived in that brutal new environment, but every now and then one wanderer did succeed in establishing itself and thereby became the ancestor of a line of descendants that thrived and multiplied.

Their progeny, meeting no natural enemies and no competitors for space or food, evolved over time according to the laws of natural selection, producing many new varieties and species. Most of these adaptations to a favoring environment are found nowhere else on earth; that is, they are endemic to the Hawaiian Islands.

The seed plants, for example, developed one of the world's most distinctive floras. Of more than 1,700 species, at least 98 percent grew only in the Hawaiian Islands. Tragically, many of these are now extinct, destroyed by exotic (introduced) plants, animals, and insects and by man. Botanists believe that all of the 1,700 species evolved from a small number of ancestors, probably fewer than 150 seeds or minuscule plants. Among the better known examples of Hawai'i's endemic plants are the splendid acacia koa, several species of hibiscus, the alpine silver-swords, the tree lobelias, and the shrubby violets.

The gorgeous native birds were even more astonishing. Only 15 ancestral immigrant species, flying in from other Pacific islands and the Arctic region, gave rise to 39 species and 39 subspecies of endemic birds. The 22 species of Hawaiian honeycreepers probably evolved from a single ancestral species, and the same kind of story can be told for endemic ferns, insects, and land mollusks.

But these native plants and animals, while they added the relief of color to the serene volcanic landscape and provided materials for shelter or ornament, could not have fed the Marquesan voyagers—who themselves were the first successful settlers of the human species.

The travelers brought many things from home—Unless the explorers of that first expedition came fully equipped to found a new colony, they would have been forced to go home again to gather up stocks of food animals and useful plants. The discoverers must have made the return voyage, and probably did so more than once. In no other way can we explain the arrival of so many plants which are not dispersed by natural means across thousands of kilometers of ocean. With the plants and animals they introduced, they altered the face of the land. They began the processes of change caused by men to which these islands are still being subjected.

Of food animals, they brought pigs, chicken, and dogs. Of plants, they brought seeds, roots, or starts of taro, breadfruit, sweet potato, yam, banana, coconut, kukui nut, mountain apple, ti, ginger, turmeric, sugar cane, paper mulberry, certain medicinals such as noni and 'awa, and undoubtedly an assortment of weeds.

They brought, too, invisible things that also took root and grew, the culture of the "widespread Polynesian race," as Captain James Cook called these astonishing rovers when he discovered them here. They brought language, customs, rituals, the social sanctions and the laws they knew as kapus, and their arts and handicrafts. Above all, they brought their deities and spirit-guardians, "the four great gods, the forty lesser gods, the four hundred, the four thousand, the forty thousand little gods," according to an ancient chant, to dwell in the land among them. And Pele would have been here to greet them, gods and men alike, as they came ashore at the end of their long voyage.

Perhaps for a generation or two the discoverers kept in touch with the homeland. Later, as younger folk replaced the colonists, and Hawai'i became the only place they cared to know, contact ceased. For several hundred years no one made the long and arduous journey, in either direction.

Conquerors came from other islands; then explorers from the continents—Sometime between 1200 and 1400, someone in the south recalled the old tales about the land of Hawai'i-loa. A new wave of Polynesians swept up from the south, this time from Tahiti and its neighboring islands. These later voyagers, arrogant and aggressive, took over the lands and the achievements of their gentler precursors in Hawai'i. Claiming descent from the greatest gods, the invaders became the conquerors and rulers of Hawai'i. These ali'i and their descendants, and the priests who worked with them, ruled Hawai'i until, in 1778, visitors from a new race arrived. Those emissaries from Europe, the men who sailed with Captain Cook, ended forever the isolation that had protected for so long these remote islands and their sheltered people, plants, and animals.

Traces of early Hawaiian settlement remain on the land—In Pele's realm today, little evidence of the early Hawaiian people can be found. They did not intrude much upon her precincts near the summit of Kilauea, probably because they feared her. The ruins of only two religious heiau, or temples, have been reported near the caldera: one upon the bluff of Uwe-kahuna, "the place of priestly weeping," where the Hawaiian Volcano Observatory now stands, the other on Waldron Ledge, the high wall above Byron Ledge.

At the southern end of the park, however, near the Kalapana entrance, the ruins of several fishing villages lie among alien weeds. This coastal area was more suitable for Hawaiians to live in: both sea and land provided all they needed to prosper. And here, too, they lived far enough away from Pele's lairs to be able to dodge her wrath whenever she sent rivers of lava down the mountainside.

Adjoining the park museum at the Kalapana entrance, stand the remnants of one of ancient Hawai'i's most sacred places, Waha'ula Heiau, the Temple of the Red-mouthed God. According to tradition, it was built in the 13th century, in the new high-walled style prescribed by Pa'ao, chief priest to the conquering ali'i. In the name of their fiercest god, Pa'ao introduced several other novelties: a red-feathered girdle for a ruling chief to wear as a sign of his office; the abasement of prostration for commoners when in the presence of their chiefs; the glaring-eyed, red-mouthed image of the god of war Ku-ka'ili-moku, Ku-the-Divider-of-Lands; and the sacrifice of human beings to that same bloodthirsty deity.

HAWAII VOLCANOES TODAY

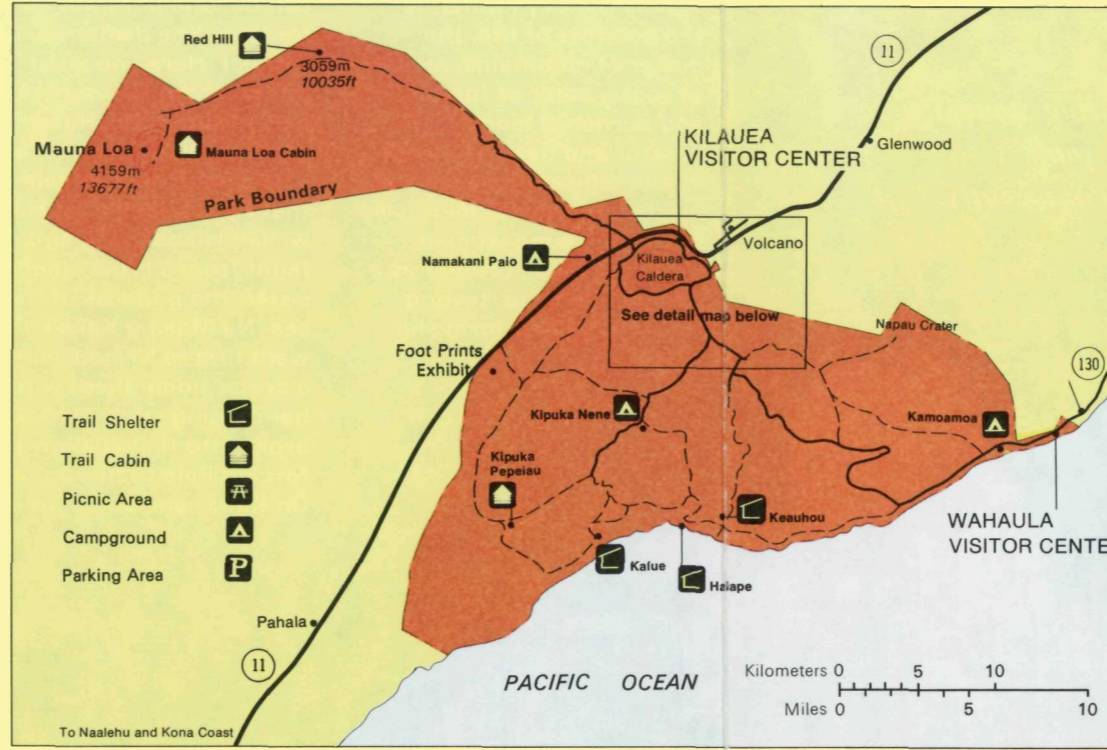
Today, this national park, created primarily to preserve the natural setting of Mauna Loa and Kilauea, is also a refuge for those native plants and animals that still survive the encroachments of civilization.

Here, too, scientists study the processes and effects of volcanism. Because Kilauea has been studied more intensively than any of earth's other volcanoes, it is one of the best understood. Geologists, geophysicists, geochemists, and volcanologists, working here and cooperating with colleagues the world around, are improving methods for predicting the times and sites of eruptions. In studying Kilauea, during its periods of quiet as well as during eruptions, they are learning more about the manner in which earth was born and its parts were formed, how continents and islands have been made and destroyed.

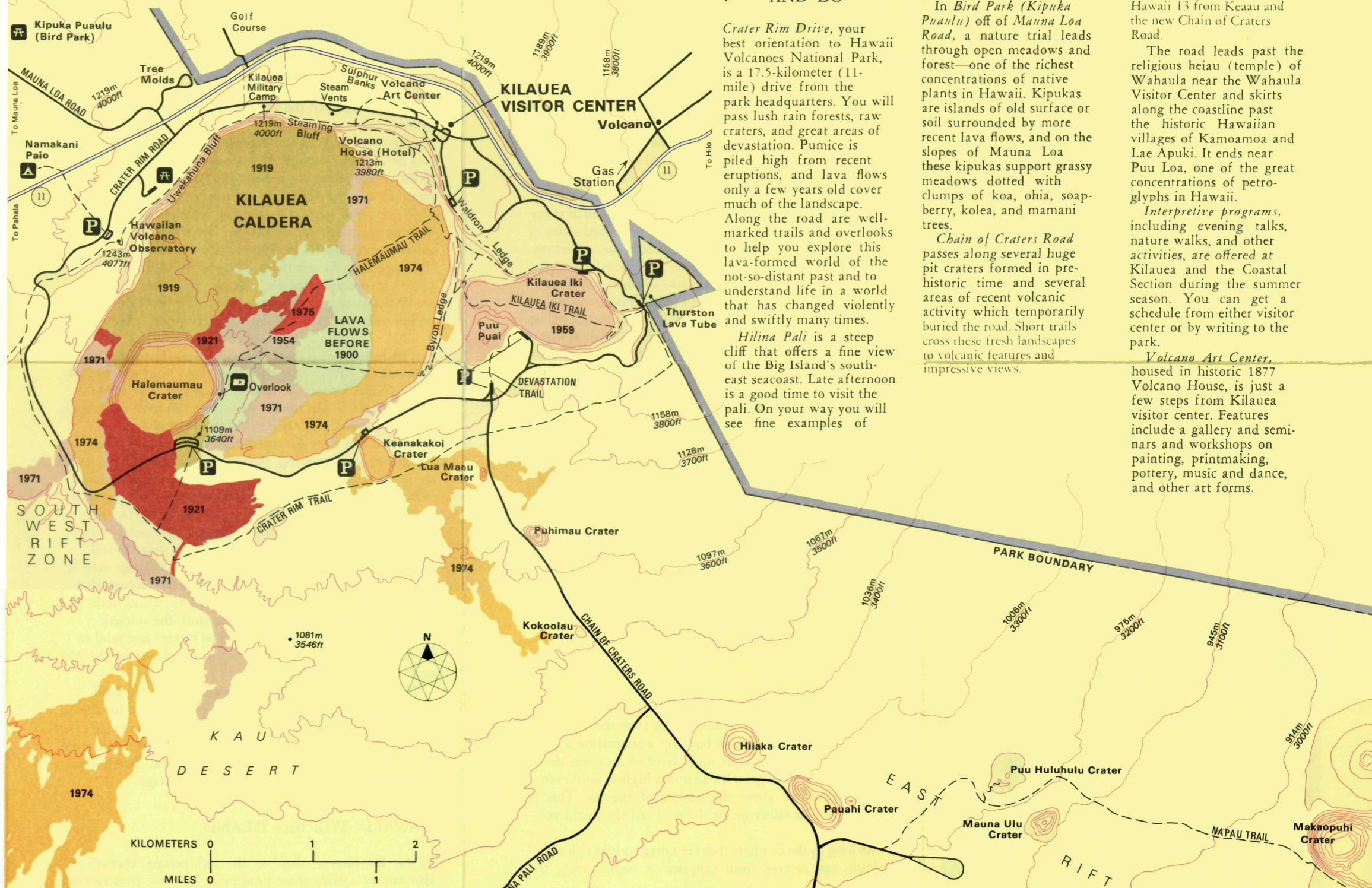
And, of course, Pele is here—sometimes resting, often fretful—and here she will stay until forced to move again, perhaps to a new island that may someday emerge from the ocean's depths.

—O. A. Busbnett

HAWAII VOLCANOES NATIONAL PARK EXTENDS FROM MAUNA LOA TO THE SEACOAST NEAR KALAPANA



ENLARGEMENT OF KILAUEA CALDERA AND CHAIN OF CRATERS (LAVA FLOWS ARE DATED AND MAPPED ONLY IN THE CALDERA AREA AND VICINITY)



MAIN TRAILS IN THE PARK

	ROUND TRIP FIGURES		REMARKS
	Kilometers	Average time	
CRATER RIM—loop trail beginning at park headquarters	17.5 11.0	1 day	Easy trail; partly paved, partly ash; through cool rain forest and warm desert
HALEMAUAMAU—begins at park headquarters; ends at Halemauau parking area (return same way)	10.2 6.4	5 hours	Self-guiding trail into Kilauea Caldera across fresh lava flows; arrange for personal pick up at parking area for one-way trip
KILAUEA IKI (via Byron Ledge)—begins at park headquarters; ends at Thurston Lava Tube parking area (return via Crater Rim Trail)	8.0 5.0	4 hours	Descent into Kilauea Iki and across the lava crust formed upon a cooling lava pond
THURSTON LAVA TUBE—loop trail beginning at Thurston Lava Tube parking area	0.5 0.3	1/4 hour	Easy, surfaced trail through a rich fern forest and lava tube; stair climb to exit tube
DEVASTATION TRAIL—begins at Puu Puai Overlook; ends at Devastation parking area (return same way)	2.0 1.2	1/2 hour	Self-guiding trail on a boardwalk across a pumice and spatter covered landscape
BIRD PARK (Kipuka Puaulu)—loop trail beginning at Mauna Loa Road	1.9 1.2	1 hour	Easy, unpaved path through forest and meadow; abundant birdlife, self-guiding trail
MAUNA IKI (Footprints)—begins 14.6 km (9.1 mi.) southwest of park headquarters on Hawaii 11; ends at Mauna Iki (return same way)	5.8 3.6	2 hours	Paved path across the Kau Desert to footprints made in 1790 ash
KE ALA KAHIKO—loop trail beginning at Wahaula Visitor Center	2.1 1.3	1-1/2 hours	Self-guiding, rough-surfaced trail through coastal forest; traces of early settlement

INFORMATION AND SERVICES

Hotels. Volcano House, at an elevation of 1,220 meters (4,000 feet) on the rim of Kilauea Crater, is open all year. Reservations are advised, especially during July and August. Write to the Volcano House, Hawaii Volcanoes National Park, HI 96718.

Campgrounds. The park's drive-in campgrounds are Kipuka Nene, Namakani Paio, and Kamoamoa. Each has eating shelters and fireplaces, but wood is not provided at any site. There is no charge and no reservation is required, but your stay is limited to 7 days per campground per year. Cabins with the use of showers are operated at Namakani Paio by the Volcano House.

Back-country camping. Hiker shelters and cabins are available, but you must register at park headquarters for overnight stays. Detailed maps are sold at park headquarters and are highly recommended. Check on trail conditions and water supplies before you start. Many trails are easy walks, but to be properly prepared check with a park ranger.

Kilauea Military Camp. This rest and recreation camp for active and retired military personnel is 1.5 kilometers (1 mile) west of park headquarters.

Adjacent facilities. Groceries, gasoline, and camping supplies are available in the community of Volcano, 1.5 kilometers (1 mile) north of the park on Hawaii 11. The stores there are open all year. Groceries and meals are also available in the

village of Kalapana, 6 kilometers (4 miles) east of the coastal section of the park.

Climate. The northern side of Kilauea's summit is 1,200 meters (4,000 feet) above sea level, and so the climate can be cool and rain can fall any time of the year. At the same time, Kilauea's leeward side is usually dry and warm. There's no record of freezing at Kilauea, but in winter the snow can extend down to 3,000 meters (10,000 feet) on Mauna Loa.

Publications. Special publications on the geology, human history, and natural history of Hawaii Volcanoes are published by the Hawaii Natural History Association to help you enjoy the park. For a price list write to the Association, Hawaii Volcanoes National Park, HI 96718.

For your safety, watch special hazards at Hawaii Volcanoes: Stay on the trails. Kilauea's surface has deep cracks, many hidden by vegetation. Recent lava flows are shelly and collapse easily. Many trails lie along cliff edges; keep children under control. Volcano fumes can compound respiratory difficulties; heed warning signs.

WHAT TO SEE AND DO

Crater Rim Drive, your best orientation to Hawaii Volcanoes National Park, is a 17.5-kilometer (11-mile) drive from the park headquarters. You will pass lush rain forests, raw craters, and great areas of devastation. Pumice is piled high from recent eruptions, and lava flows only a few years old cover much of the landscape. Along the road are well-marked trails and overlooks to help you explore this lava-formed world of the not-so-distant past and to understand life in a world that has changed violently and swiftly many times.

Hilina Pali is a steep cliff that offers a fine view of the Big Island's southeast seacoast. Late afternoon is a good time to visit the pali. On your way you will see fine examples of

pahoehoe lava along this edge of the Kau Desert.

In Bird Park (Kipuka Puaulu) off of Mauna Loa Road, a nature trail leads through open meadows and forest—one of the richest concentrations of native plants in Hawaii. Kipukas are islands of old surface or soil surrounded by more recent lava flows, and on the slopes of Mauna Loa these kipukas support grassy meadows dotted with clumps of koa, ohia, soap-berry, kolea, and mamani trees.

Chain of Craters Road passes along several huge pit craters formed in pre-historic time and several areas of recent volcanic activity which temporarily buried the road. Short trails cross these fresh landscapes to volcanic features and impressive views.

The Coastal Section of the park is accessible via Hawaii 13 from Keau and the new Chain of Craters Road.

The road leads past the religious heiau (temple) of Waha'ula near the Wahaula Visitor Center and skirts along the coastline past the historic Hawaiian villages of Kamoamoa and Lae Apuki. It ends near Puu Loa, one of the great concentrations of petroglyphs in Hawaii.

Interpretive programs, including evening talks, nature walks, and other activities, are offered at Kilauea and the Coastal Section during the summer season. You can get a schedule from either visitor center or by writing to the park.

Volcano Art Center, housed in historic 1877 Volcano House, is just a few steps from Kilauea visitor center. Features include a gallery and seminars and workshops on painting, printmaking, pottery, music and dance, and other art forms.

HELP PROTECT YOUR PARK

To protect yourself and the natural beauty of the park, please pay special attention to these regulations. They are enforced by park rangers.

Registration at park headquarters is required for back-country camping on Mauna Loa and for other overnight hikes.

Fires are permitted only in designated camp and picnic sites. Don't leave your fire unattended.

Collecting rocks or picking plants is prohibited.

Hunting is prohibited except by deputized park rangers assisting in pig and goat control programs. Firearms are otherwise not to be carried or displayed unless broken down or cased.

Vehicles of all kinds are restricted to designated roadways.

Pets must be under physical control at all times. **Park roads** are for leisurely driving only. The maximum speed is 88 kilometers per hour (55 mph) on the primary roads; slower speeds are posted.