

# Liberty Call

## PELE'S MARCH TO THE SEA



January 1999 - Lava bubbles burst on the Kamokuna lava bench, south coast of Kilauea Volcano, Hawaii. As sea water infiltrates the extremely hot lava tube within the bench, the water flashes to steam and explodes through a skylight in the tube.

### The geologic origin of the Hawaiian Islands

By Ken Cornia  
MWR Outdoor Recreation

Hawaii is a unique and remote land located near the center of the world's largest ocean basin - thousands of miles from any continent or tectonic plate boundary.

According to the theory of plate tectonics, the surface of the earth is broken into large plates, much like the cracked shell surface of a hard-boiled egg. Each shell fragment is still attached to the egg, similar to the individual tectonic plates on the surface of the earth.

These plates are constantly in motion, being driven by the heat generated deep within the earth's interior and move at approximately the same rate of speed that our fingernails grow.

The edges of these plates, where they move against each other, are sites of intense geologic activity, such as earthquakes, volcanoes, and mountain building.

Molten rock finds its way to the surface

where these plates collide and separate, but occasionally there are "hot spots" that can erupt somewhere on the individual plates themselves.

The world-renowned geyser "Old Faithful" in Yellowstone National Park and the Hawaiian Islands, though on separate tectonic plates, share this unique distinction of origin.

The Hawaiian Islands ride on the Pacific plate which carries them to the northwest at the rate of about four inches every year.

The source of the heat comes from the earth's hot interior, which rises from below the plate in narrow plumes like the smoke from a chimney.

A plume heats the underside of the passing plate like a welder's torch and melts the rock which erupts through volcanoes above the hotspot.

The Hawaiian Islands are almost like individual cookies being continually generated from the same spot as the cookie sheet keeps coming out of the oven.

Since the Pacific plate is moving to the northwest, Kauai is the elder statesman, but Hawaii's most dynamic family member is its youngest hotheaded sibling to the east, the Big Island of Hawaii. To be

fair of course, we would all have a hot temper, not to mention high blood pressure, if we were sitting directly on top of a hot spot.

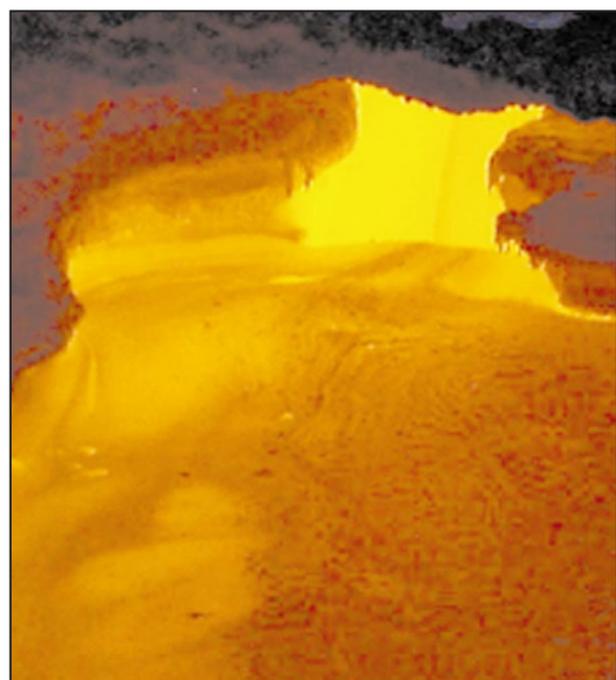
Being the youngest, the Big Island is also the least wrinkled and eroded of the islands, with less time of exposure to the wind, rain, waves, salt water and animals, which all contribute to expediting the aging process.

If we are to better understand the past, then we must look at the present for answers.

A visit to Hawaii Volcanoes National Park offers us a glimpse of how the older Hawaiian Islands appeared when they too sat upon the hot spot and their volcanoes were still active.

The Hawaii Volcanoes National Park is the biggest tourist attraction in Hawaii and the outdoor recreation programs at Pearl Harbor will take you there. It is an adventure of a lifetime, and who knows, you may even see an eruption!

MWR Outdoor Recreation is planning its next "Millennium Big Island Adventure" for Dec. 30 - Jan. 1. There are still a few openings left. Call Ken Cornia at 473-5443 or 473-0899 as soon as possible if interested.



February 1990 - A view looking uphill at surface lava flows advancing down the steep slope (Palama pali) between the right zone and the coastal plain of Kilauea Volcano. Volcanoes and other sites of intense geologic activity are the result when the edges of tectonic plates deep within the earth's interior move against each other.



Photos courtesy of  
Department of the Interior,  
U.S. Geological Survey

Top: September 1984 - The Pu'u 'O'o Kupaianaha eruption of Kilauea is now in its 18th year and 55th eruptive episode. Lava flows have destroyed over 180 homes and resurfaced more than 13 km of highway in its path.

Bottom: May 1998 - A view into the skylight of an active lava tube as lava cascades down a steep slope on the coastal plain of Kilauea Volcano.