Kilauea erupts; Long Valley shakes

For volcanoes, and for volcano-watchers, it was a restless week. In Hawaii, Kilauea volcano displayed its explosive strength in its most powerful eruption since 1977. And in eastern California, thousands of small earthquakes — and two larger ones — shook the site of a long-dormant volcano in the Long Valley area in the Eastern Sierras.

By mid-week, quiet seemed to be returning to both locations, but watchful researchers maintained 24-hour vigils to chart the earth's vital signs. By Wednesday Kilauea's Napau crater, located in a remote area of Volcanoes National Park, still was spurting fountains of streaming lava 150 feet into the sky, but Reggie Okamura, acting chief scientist at the U.S. Geological Survey's Hawaiian Volcano Observatory, said that the volcano's eruptive activity had diminished. On Jan. 2, earthquakes in the area presaged an eruption. Twenty-four hours later, lava fountains 450 feet high emblazoned the sky. In spasm after spasm, the molten rock shot up and then plummeted back to earth where most of it disappeared into another crack on the mountain's side.

While the volcano has been active in recent years, eruptions have lasted only one day, Okamura says. After a week of activity, the crater was beginning to contract, a sign that the volcano's supply of magma may be depleted.

As for California, there is no eruptive activity at the basin-shaped Long Valley caldera near the popular ski resort town of Mammoth Lakes, and scientists are unsure if, or when, the volcano will erupt. The sequence, or swarm, of small earthquakes began the afternoon of Jan. 6. While two relatively large shocks with Richter magnitudes of 5.5 and 5.6 occurred that day, inflicting some property damage, most of the quakes have been less than magnitude 3.0, says Marianne Guffanti of the USGS in Menlo Park, Calif. By Wednesday, records showed that more than 3,000 shocks greater than magnitude 1.0 and less than 3.0 had occurred between the earth's surface and depths of 10 kilometers. The frequency of the low-level quakes had decreased from tens per hour to five per hour but, she said, "We can't predict a trend. This is just what's happened."

Wide World

Geologists at Kilauea's east rift monitor the fiery progress of the recent eruption.

Researchers are conducting measurements to learn if the ground is being deformed by pressure from magma moving up toward the surface. USGS geologist Charles Bacon reports that so far little or no vertical change has been noted, but that in the last three weeks the land has been extended, or stretched, 4 centimeters over a distance of 4 km. The current earthquakes are occurring from 2 to 8 km east of the location where a similar swarm was centered last spring (SN: 6/12/82, p. 390). That event led the USGS to issue a notice of potential volcanic hazard, the lowest level of official concern.

—*C. Simon*

Defective heart is restructured

For the first time, a fatal heart defect that afflicts some 1,000 American newborns each year — hypoplastic left heart syndrome — has been successfully corrected. The surgical feat was accomplished by cardiologists William I. Norwood and Peter Lang and anesthesiologist Dolly D. Hansen of the Children's Hospital Medical Center in Boston.

In the healthy newborn, as in the healthy adult, the heart consists of four chambers — two upper chambers called the left and right atria and two lower chambers called the left and right ventricles. Blood that has been used by the body flows into the right atrium, then into the right ventricle, and out an artery called the main pulmonary artery to the lungs. There, it receives oxygen. It then flows from the lungs to the left atrium, into the left ventricle and out an artery called the aorta to the body, to be used.

In a victim of hypoplastic left heart syndrome, the left side of the heart is grossly underdeveloped. The mitral valve connecting the left atrium and left ventricle is often narrowed. There is frequently an abnormally small ventricle or none at all. The aorta is often severely narrowed. These defects have invariably proved fatal because the heart is unable to receive oxygenated blood from the lungs nor to pump it to the body. The death of an infant with this syndrome is especially tragic because, unlike other congenital heart disease victims, he tends to be healthy except for his heart defects.

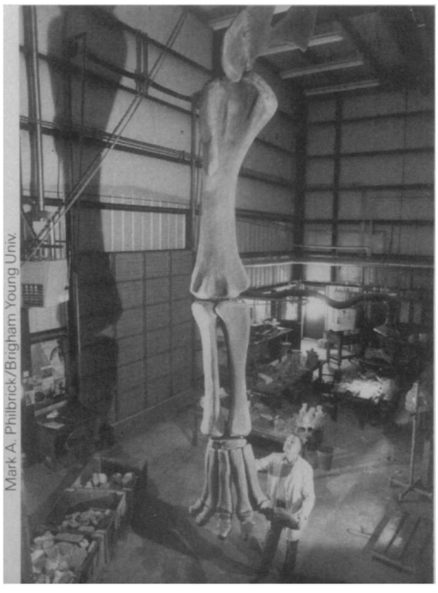
Recent advances in pediatric cardiac surgery prompted Norwood and his coworkers to devise a bold new approach to surgically restructuring the heart afflicted with hypoplastic left heart syndrome. The remodeling, in essence, consists of two surgical steps. In the first, the aorta is hooked up with the main pulmonary artery. In the second, lung arteries are connected to the right atrium. Oxygenated blood could then return to the right atrium instead of to the left one, and oxygenated blood could then flow from the right atrium into the right ventricle, through the main pulmonary artery into the aorta, to supply the body.

Norwood and his colleagues tried the approach on three infants with hypoplastic left heart syndrome. It succeeded in two of the three, Norwood told SCIENCE NEWS. Their success with one of the two patients is reported in detail in the Jan. 6 NEW ENGLAND JOURNAL OF MEDICINE. The child underwent the first step of corrective surgery at three days of age, and the second at 16 months of age. Today he is two years old and healthy.

Norwood foresees the technique being applied to other victims of the syndrome.

—*J. A. Treichel*

Ultrasaurus: Footwork in fiberglass



Mark A. Philbrick/Brigham Young Univ

This fiberglass model of a leg, 26 feet long from toe to tip, of the dinosaur Ultrasaurus *gives a vivid hint of what the rest of the largest known dinosaur was like. The model is suspended from a crane inside paleontologist James A. Jensen's workshop at Brigham Young University in Provo, Utah. If the leg were fossilized, it would weigh three-fourths of a ton. Jensen had planned to make a complete replica of the 60-foot-tall animal, but will retire in August and pursue other projects. The existence of* Ultrasaurus *is known from a 9-foot-long shoulder blade that Jensen unearthed in 1979 from the Morrison formation in Colorado (SN: 8/4/79, p. 84). He calculated the dimensions of the limb using information based on other animals in the same group, the Brachiosaurs.*