

two to three decades before the second occurred and may have been the same one that destroyed the city of Salamis in eastern Cyprus in A.D. 342.

The citizens of Kourion probably had little chance to flee the second earthquake, says Soren. Historical records indicate it created tidal waves from southern Greece to Alexandria, Egypt.

Fifteen rooms have been unearthed in the house so far. The most recent skeletons were found under three feet of rubble. They were, perhaps, a family in their bedroom, says Soren.

The woman, estimated to be about 19 years old, clutched a child of about 18 months of age, protecting its skull with her arms. The woman's neck was broken by falling plaster and stones. The man, whose age has not been determined, shielded the woman, his left arm reaching across her to hold the child's back.

In addition to the skeletons, the 34-member scientific team found elaborate painted decorations in the house and a complete kitchen built into one section. The kitchen was equipped with a mud-brick oven, a bronze pitcher, a serving plate, a number of two-handled jars, several cooking pots, a copper-alloy fish-hook and fragments of about 20 lamps. Charcoal from the oven will be analyzed, says Soren, for evidence of what was being cooked.

At the bottom of a cistern, the investigators found a necklace of amber, coral and jet that may, according to Soren, have come from the western coast of Turkey.

— B. Bower

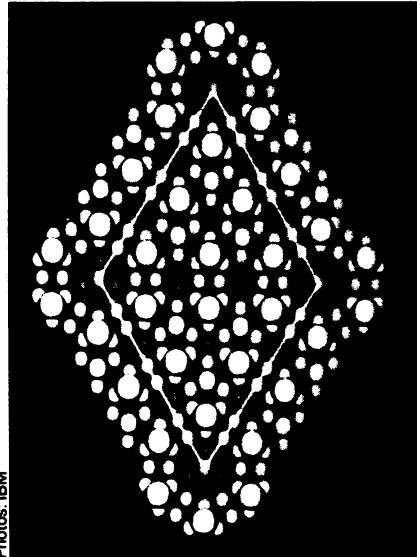
## Augustine volcano erupts quietly

Avalanches, glowing lava and 10,000-foot-high trails of ash and steam signaled on Aug. 20 that the Augustine Island volcano in Alaska entered a new phase of activity, the third outburst since it erupted last March 27 (SN:5/17/86, p. 309). Located at the entrance to Cook Inlet, 175 miles southwest of Anchorage, the 4,025-foot volcano is also sending dense flows of ash and steam down its slopes and building a new dome of molten rock to replace the one it partially blew off in March.

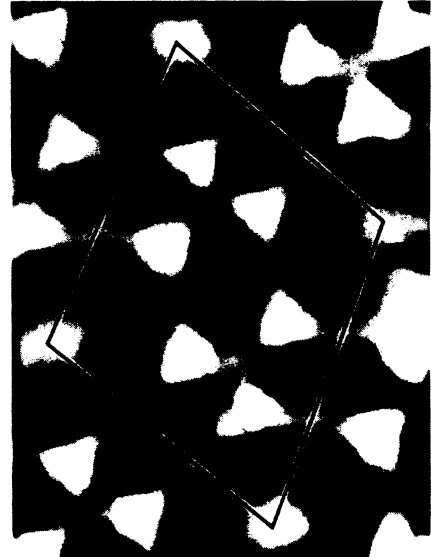
This activity is characteristic of volcanoes having magma rich in silica. According to Charlotte Rowe, a graduate student at the University of Alaska in Fairbanks who is conducting research on the volcano, the magma flowing up through the volcano is thick and slow-moving, unlike the runny magma of the silica-poor Hawaiian volcanoes. "It oozes out like toothpaste coming out of a tube," Rowe says. When it reaches the surface, the magma tends to cool and plug up the opening, forming a dome.

Silica-rich magma also holds a higher

## Atomic bonds: Seeing the links



Photos: IBM



The invention of the scanning tunneling microscope (SN:4/2/83,p.213) and later refinements have allowed increasingly sharper views of atoms perched on solid surfaces. The latest advance brings pictures not only of silicon atoms neatly arrayed on a silicon surface but also of the bonds holding the atoms in place.

A scanning tunneling microscope uses the tiny electric current that flows between a probe tip and a sample, only a few atomic diameters apart, to trace out a contour map of the sample's surface atoms. As the probe is moved back and forth across the sample, its vertical height is continually adjusted to keep the current constant. Normally, the voltage applied between the sample and probe also stays the same. In this case, scientists at the IBM Thomas J. Watson Research Center in Yorktown Heights, N.Y., periodically hold the probe still while varying the voltage. This provides a map of how the current varies at selected points over a surface. The information is then used to show where electrons bonding surface atoms are likely to be.

The picture at left shows a theoretical model, confirmed by earlier microscopic views, of a silicon atomic structure, magnified about 30 million times. The diamond-shaped outline reveals the repeating unit that makes up the complete surface. The picture at right shows wispy bonds that reach up from a sample's second atomic layer and connect with surface atoms, seen as bright spots.



U.S. Geological Survey



In a calmer continuation of its March eruption (left), Alaska's Augustine volcano spews ash and steam (right).

proportion of gases, which bubble out of the upwelling molten rock. If a dome seals the opening of the volcano, the pressure builds up inside until the gas explodes in a new eruption.

The March explosion, says Rowe, was mainly the release of gases. The magma is continuing to ooze upward, cracking open the remains of the old dome and daily sending three to four avalanches of debris down the slopes. Rowe says the absence of significant earthquakes at

this stage indicates that the magma now flowing is part of the eruption that began violently in March. "If there were new magma from deeper levels . . . we would expect to see seismic activity similar to that just prior to the March eruption," she says. While the recent activity could continue for months or years, the likelihood of another explosion soon is "probably less than half," Rowe notes, however, that sparse information about the volcano makes predictions difficult. — T. Kleist