

Aging and Eating: Good News for Some

It's called the tea and toast phenomenon — elderly people nibble on carbohydrate snacks all day, shying away from preparing full meals and suffering from a protein-poor diet. That is the picture that emerged from anecdotal studies and national surveys conducted in the United States and England over the last 10 years. It is also what nutrition scientist Judith Wurtman expected to find when she and her co-workers at the Massachusetts Institute of Technology began a study comparing the food intake of healthy older people with that of younger people.

Instead, she discovered quite the opposite. "The older people didn't snack at all . . . and their protein intake was much higher than we anticipated. It was gram-for-gram almost identical to the [protein intake] of the young," she said at a recent

seminar at the National Institutes of Health, where she presented her preliminary findings.

Wurtman's results suggest that there is no underlying *biological* reason for healthy older people to avoid protein. She says elderly people who are not eating enough protein may be doing so for socioeconomic reasons — such as not being able to afford protein-rich meals, or being too lonely to cook for themselves. Or, she suggests, there may be other biological abnormalities, such as depression or alcoholism, that influence food choice. But aging *per se* does not appear to affect protein consumption.

In past work, Wurtman and others have shown that obese people and depressed people often crave carbohydrates because their brains are deficient in a chemical called serotonin, and carbohydrates increase serotonin levels (SN:4/7/84,p.216). She had anticipated that older people would also constantly snack on carbohydrates, perhaps because they need to compensate for the loss of serotonin-containing brain cells. But Wurtman found that the study's 49 older people, aged 65 to 94 years, actu-

ally ate fewer carbohydrates than did the 33 younger people, aged 15 to 35 years. The group that ate the least-balanced meals, she says, was the young women.

Wurtman says her study is the first to monitor carefully food intake in the elderly. For several days her subjects lived at an MIT research center where their meals were cooked for them. The carbohydrates and proteins they consumed, both as snacks and as meals, were measured directly. In past surveys, says Wurtman, researchers usually estimated food consumption by interviewing subjects about what they ate. Because there were no standardized meals made available to all participants, researchers could have only a qualitative feel for the nutritional content, and some participants may not have eaten some kinds of foods because they did not want to prepare meals themselves.

Wurtman would like to use her recent results on the eating habits of healthy older people as a standard against which to compare the food choices, and hence perhaps the brain function, of elderly people with illnesses and other dysfunctions. Other researchers maintain that, for whatever reasons, a large number of elderly still eat poorly. But Wurtman's conclusion for the healthy subset of older people tested in her study is that "these people eat very well. I think that's quite reassuring." — S. Weisburd

Cameroon: Death by suffocation

The more than 1,500 people who perished after a gaseous cloud escaped from Lake Nyos in Cameroon on Aug. 25 (SN:8/30/86,p.133) probably died of suffocation, the Agency for International Development (AID) announced at a press briefing this week. After interviewing survivors and performing autopsies on humans and animals, a medical team sent by AID tentatively concluded that the victims became unconscious within seconds of exposure to carbon dioxide, along with hydrogen sulfide compounds. They died shortly thereafter of respiratory or cardiac failure. The pathologists found no evidence that cyanide or carbon monoxide was involved in the deaths. They also determined that acids containing sulfur caused the skin burns on many victims.

In addition, according to M. Peter McPherson of AID, a geosciences team "reports that the best evidence, as of this time, is that this disaster was not the result of an earthquake or of volcanic activity." McPherson says they are still not certain what caused the normally still bottom waters of the lake to come to the surface, releasing the gas cloud. One possibility is that heavy rains in the region prior to the disaster might have caused sediments to slide and disrupt the bottom waters. McPherson says that the Cameroon government has asked the geoscientists to evaluate the hazards of other lakes in the region, and that AID has agreed to fund that study.

— S. Weisburd

Roman city yields new quake clues

In two seasons of field work at the 16-century-old Roman city of Kourion on the island of Cyprus, a team of scientists uncovered evidence of a massive earthquake that struck the outpost on July 21, A.D. 365 (SN:8/3/85,p.71). In their latest excavations at the site, the researchers have discovered the well-preserved skeletons of a man, a woman and a small child clinging together in the ruins of a house that was leveled during the earthquake.

This brings to seven the number of human skeletons uncovered in the house, the only one explored so far. "I think seven skeletons in one house indicates a tremendous loss of life," says archaeologist and project director David Soren of the University of Arizona in Tucson. The catastrophe may have been comparable to that caused by the Vesuvius volcanic eruption at Pompeii and Herculaneum in A.D. 79, he adds.

The excavation, conducted this past summer, also provided clues to another, less powerful seismic rumble that hit the area 20 to 30 years earlier. Crucial to the analysis of the earlier earthquake was the identification of several levels in an extensive courtyard. Large columns had fallen on an early level and then had been stacked up and moved aside. Apparently, the later, more devastating earthquake



Skeletons of a man, a woman and a child uncovered in house in Kourion.

hit before heavy rubble was cleared away. Surrounding structures also showed signs of partial rebuilding from earlier earthquake damage. Geologist Frank Koucky of Wooster (Ohio) College estimates that the first earthquake struck

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

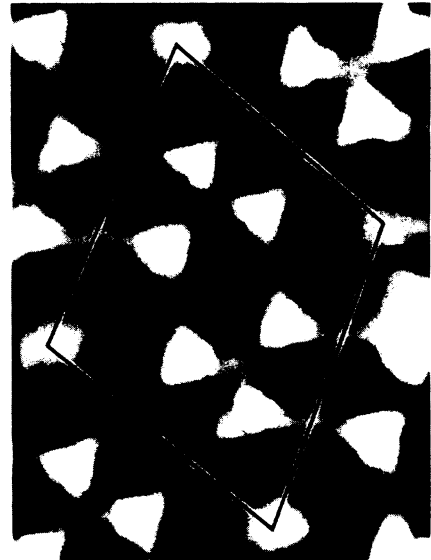
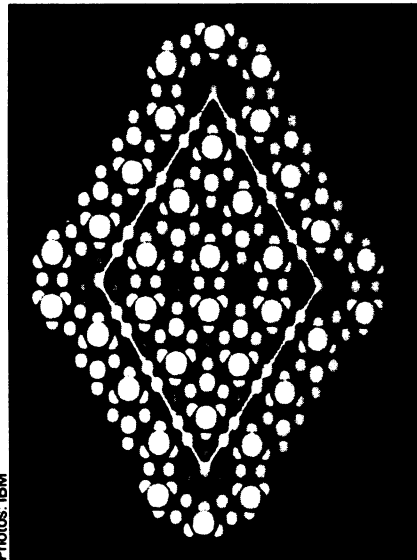
Augustine volcano erupts quietly

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

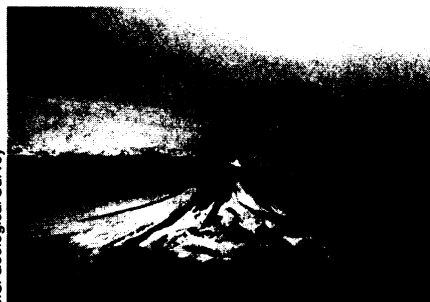


Photos: IBM

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