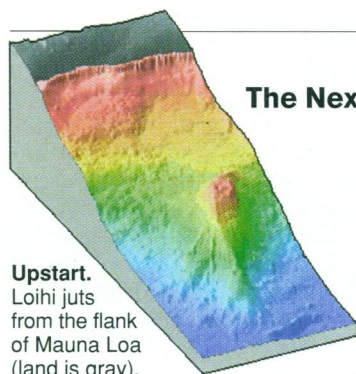


RANDOM SAMPLES

edited by CONSTANCE HOLDEN



Upstart. Loihi juts from the flank of Mauna Loa (land is gray).

JOHN SMITH AND TERRI DUENNERBER

The Next Hawaiian Island?

There's been an unprecedented rumbling under the ocean this summer, signaling extensive activity at Loihi Seamount, an underwater volcano 32 kilometers offshore from Hawaii's Big Island. It's rearranged the ocean floor in the area and added to a volcano that—one of these coming centuries—is expected to pop above sea level and join the Hawaiian

island chain. Loihi, Hawaii's youngest volcano (it was found to be active in the late 1970s), is fed by the same magma source that serves Mauna Loa and Kilauea on the Big Island—two of the world's most active volcanoes. Loihi itself is no shrimp—it's taller than Mount St. Helen's was before her 1980 blowup. And during July and August it hosted an unprecedented seismic event: "the largest swarm of earthquakes ever recorded at any Hawaiian volcano"—over 4000 tremors since 17 July—according to the University of Hawaii's (UH's) Center for Volcanology.

University scientists went on an investigatory cruise earlier this

month to the seamount and, with *Pisces*, their crewed submersible, collected evidence spewed up by Loihi, including "some of the freshest glass ever received from this volcano," according to their trip report. Now the map of the sea floor will have to be redrawn: Hydrothermal vents named "Pele's vents" have turned into a crater named "Pele's pit."

Ken Rubin of the UH department of geology and geophysics says "Given the current rate at which Loihi is growing, it is likely [to] break the surface of the ocean" at some point in the distant future, most likely in tens of thousands of years. Just how soon depends on volcanic activity, wasting events such as landslides, and changes in sea level.

Trade Skirmish Hobbles Modelers

The U.S. National Center for Atmospheric Research (NCAR) won't be getting its long-desired new supercomputers anytime soon. The National Science Foundation (NSF) announced last week that it will delay approval for the purchase, putting on ice plans to upgrade scientists' capacity for predicting global warming and other climate trends.

What's the holdup? The snag is a Commerce Department investigation, announced on 19 August, into allegations that Japanese vector supercomputers were being dumped, or sold below cost, in the United States. Included in the investigation is a \$35 million deal for four state-of-the-art supercomputers struck between NCAR in Boulder, Colorado, and a firm representing NEC Corp. of Japan. On 17 May, NCAR announced that it had chosen NEC's bid over offers from U.S.-based Cray Research and another Japanese company. Three days later, Commerce told NSF that it believed the machine's cost of production "is substantially greater" than NEC's bid. On 29 July, Cray petitioned the International Trade Commission (ITC) and the Commerce Department to launch investigations.

NSF's decision to hold up the sale "will slow down the rate of progress" in developing long-term climate models, including those for predicting greenhouse gas flux in the atmosphere, says Richard Anthes, president of the University Corporation for Atmospheric Research, which manages NCAR. A new supercomputer was expected to be in place this fall but will be delayed at least several months, Anthes says.

NCAR is now looking for alternatives, such as leasing supercomputer time from another facility. The ITC is expected to issue a ruling by 12 September; if it finds in favor of Cray, the Commerce Department will continue its investigation and issue a decision by 6 January.

Stalling Gangrene With Gene Therapy

Scientists have reported the first successful human gene therapy for stimulating the growth of new blood vessels, restoring blood flow to a damaged limb.

In the 10 August issue of *The Lancet*, a team led by Tufts cardiologist Jeffrey Isner describes coating an angioplasty balloon with a gel containing the DNA of a gene that codes for vascular endothelial growth factor (VEGF). The team inserted the balloon into an artery in the right leg of a 70-year-old woman with gangrene in her big toe. Four weeks later, a scan revealed an increase in the density of blood vessels between the woman's knee and ankle. In addition, her resting arterial blood flow had picked up by 82%. The study, says Harvard angiogenesis expert Judah Folkman, is "imaginative and ground-breaking."

VEGF has an advantage over other angiogenic compounds in that it appears to target only endothelial cells, which line blood-vessel walls. "That removes some of the concern," Isner says, of stimulating blood-vessel growth in normal cells, such as smooth muscle, or even worse, in precancerous cells.

VEGF gene therapy could prove immediately beneficial for patients "who have exhausted conventional options and are scheduled for amputation," says Isner, who estimates that some 100,000 such operations are performed in the United States each year. In addition to spurring blood-vessel growth, he says, VEGF may also assuage the "round-the-clock horrendous pain" that ischemia patients often experience. In an earlier trial of low-dose VEGF gene therapy, patients required fewer painkillers after the procedure. However, warns James Wilson,

director of the University of Pennsylvania's Institute for Human Gene Therapy, more work is needed to show conclusively that blood-vessel growth and increased blood flow are due to VEGF rather than to other treatment aspects.

The Tufts team is about to launch a new study in which it will inject the VEGF gene directly into a patient's knee and calf muscles. Isner says he hopes also to launch phase-II, multicenter trials next year. Further down the road, he says, such therapy might be tried for stimulating blood-vessel growth in the heart and brain.

Genius's notes. At right is a page from the *Codex Leicester*, said to be the most scientific of Leonardo da Vinci's notebooks, detailing his observations on moonlight. Leonardo theorized a century before Galileo that the light of the new moon is sunlight reflected from Earth's oceans. The 72-page *Codex*, written between 1506 and 1510, also notes that marine fossils on the high Italian plains indicate that the land was once an ocean floor. The manuscript, purchased by computer magnate Bill Gates at Christie's in November 1994 for \$30.8 million, will be on display at New York's American Museum of Natural History from 26 October to the end of the year.

