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# Earth Sciences

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## Mainland U.S. volcano could erupt

Few Americans have heard of Mount St. Helens, a 9,677-foot volcano in southwestern Washington State, but chances are that by the end of the century they will. Three scientists with the U.S. Geological Survey say an eruption is likely within the next hundred years, perhaps within the next few decades.

Mount St. Helens has been more active and more violent during the last few thousand years than any other volcano in the conterminous United States. It has been dormant since 1857, but, say Dwight R. Crandell, Donald R. Mulinieux and Meyer Rubin, the repetitive nature of its eruptive history during the last 4,000 years, with dormant intervals usually of a few centuries or less, suggests that it could go off again in the not-too-distant future. If so, it could be a big blast. Volcanism at Mount St. Helens has probably included many violent but brief eruptions like the catastrophic eruption of Mt. Vesuvius in 79 A.D. The volume of ejecta produced by some of its larger eruptions has been similar to that produced at certain times by Vesuvius, Fuji in Japan, and Hekla in Iceland. Virtually the entire visible volcano has formed since about 500 B.C., and most of its upper part has been built within the last few hundred years.

## Precambrian magnetic field reversal

It is well known that the earth's magnetic field periodically reverses its polarity—the north magnetic pole becomes the south and vice versa. Many reversals in the Cenozoic, Mesozoic and Paleozoic are well documented. Now comes a report of the first detailed study of a geomagnetic reversal farther back into the earth's past, in the Precambrian era, which ended 600 million years ago.

The evidence, reported in *NATURE* (vol. 253, p. 332) by D. K. Bingham and M. E. Evans of the University of Alberta, comes from paleomagnetic studies of rocks of the so-called Stark Formation in Canada. They are 1.65 billion to 1.80 billion years old.

There are two extreme possibilities for the way in which a reversal occurs: a 180-degree "flip" with no change in strength, or a gradual decay followed by reestablishment in reverse polarity. Most studies of more recent reversals favor the latter situation, and this one does too. It shows "strong evidence of a real decrease in the dipole moment during reversal."

"Whatever is the exact mechanism involved in geomagnetic field reversal," Bingham and Evans conclude, "the data reported here indicate that the process has remained essentially unchanged for nearly 2 billion years of the earth's history."

## Absolute motion of earth's plates

How fast are the different crustal plates of the earth moving? Calculating the entire system is difficult because of lack of an absolute frame of reference. William M. Kaula of the University of California at Los Angeles uses a new technique called boundary-velocity minimizations to calculate absolute plate motions of a full system of 13 plates. His solutions are reported in the *JOURNAL OF GEOPHYSICAL RESEARCH* (vol. 80, p. 244): Ocean tectonic plates move at rates of the order of 5 centimeters a year. Continental tectonic plates move about 1½ cm/year. Boundaries between oceanic plates have translational motions of the order of 2 cm/year. Boundaries between oceanic and continental plates move about 1½ cm/year.

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# Biomedicine

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## Memory recall in people

Research on animals, notably by E. Roy John, a neuropsychologist with the New York Medical College, suggests that recall of specific memories is manifested as specific patterns of electrical waves in the brain (SN: 2/8/75, p. 83). Now research reported in the Feb. 28 *SCIENCE* suggests that recall works the same in people.

Henri Begleiter and Bernice Jorjesz of the State University of New York at Brooklyn attached electrodes to the brains of 18 college students. The subjects were told that they would be exposed repeatedly to bright, then dim flashes, and that they should press one or two switches after each visual stimulus to indicate whether they had seen a bright or dim flash. In fact, dim and bright flashes were presented randomly. During the experiment, the investigators recorded the patterns of electrical waves in the subjects' brains.

The subjects showed different patterns of electrical waves to identical physical stimuli whenever they came to different behavioral decisions. These results suggest that the wave patterns represented activation of specific memories, rather than responses to actual sensory stimuli. The investigators repeated the experiment, using somewhat more sophisticated parameters, such as paying the subjects for discriminating correctly between bright and dim flashes. They obtained the same results.

## Light and noise: Double insult

The damaging effects of noise pollution on people and animals are well documented. The harmful effects of light pollution is starting to be explored (SN: 4/20/74, p. 258). Now research reported in *NATURE* (vol. 253, p. 346) shows that the interactions of noise and light pollutants also can be harmful.

N. K. Humphrey and G. R. Keeble, animal behavior scientists at Cambridge University, England, studied four monkeys to see whether their natural aversion to red light increased when they were exposed to unpleasant background noise. Two of the monkeys, which were known to be extremely sensitive to noise, increased their aversion to red lights in the presence of noise. The other two monkeys, which were known not to be particularly sensitive to noise, did not increase their aversion to red light in the presence of noise. These results suggest that two kinds of environmental pollutants can have a double-whammy effect, at least for subjects that are extremely sensitive to the pollutants.

## Treating urinary tract infections

Chronic urinary tract infections directly related to sexual intercourse are not uncommon in women. Physicians often treat these patients for the short term, suggest they abstain from sexual activity or empty their bladders after intercourse. In the experience of Kenneth L. Vosti of the Stanford University School of Medicine, these practices don't work very well. So he had 14 patients with chronic urinary tract infections give themselves a dose of an antibiotic after sexual intercourse for 19 to 111 months each, or a total of 761 months.

A total of 19 infections occurred while the patients were taking this preventative medicine, Vosti reports in the March 3 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, significantly less than the 90 infections recorded during the 705 months when these patients did not take preventive antibiotics.

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