generating a self-destructive response when reexposed to these infections later, Ponsonby says.

In the Australian state of Tasmania, Ponsonby and her colleagues identified 136 people with MS and 272 others of matching age and gender who didn't have the disease. All participants gave blood samples, and each one or a close relative provided details of the participants' childhoods.

For each study volunteer, the researchers calculated the number of preschool years—up to age 6—accumulated with a sibling age 2 or younger. Years with each baby brother or sister were counted separately and then added together. Those participants who had accumulated more than 5 such years had a risk of MS only one-eighth as great as that faced by a person with less than a year of such contact.

People who had had 1 to 5 years of preschool contact with baby siblings had roughly half the chance of later developing MS that people with less exposure did, the researchers report in the Jan. 26 *Journal of the American Medical Association.*

The participants averaged age 44 at the time of the study. When they were children, there was little day care in Tasmania, suggesting that most preschool contact was with family members, the authors say.

The infectious agent most often linked to MS is Epstein-Barr virus. When contracted in early childhood, the virus causes only mild, flulike symptoms. But if a person gets an Epstein-Barr infection after the onset of adolescence, the virus can cause infectious mononucleosis. Nearly all the study participants had been exposed to the virus at some point, blood tests showed. But the MS patients were more than twice as likely as the others to have had mononucleosis.

The study provides "further confirmation of an important role for [Epstein-Barr virus] in MS," says Alberto Ascherio of the Harvard School of Public Health in Boston. "It seems that it's better to be infected . . . early in life than during adolescence." —N. SEPPA

In a Snap

Leaf geometry drives Venus flytrap's bite

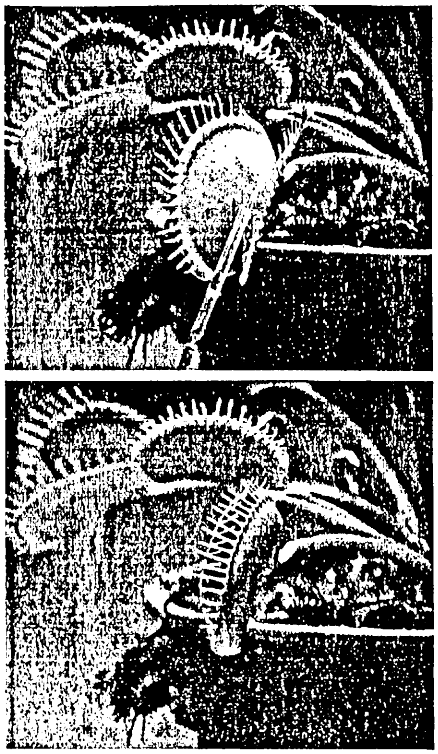
In a mere tenth of a second, without any muscles, a Venus flytrap's jawlike leaves can imprison a hapless insect. Since the time of Charles Darwin, scientists have struggled to understand this feat.

In the Jan. 27 *Nature*, researchers offer a possible explanation: With its peculiar leaf geometry, the flytrap *Dionaea muscipula* achieves fast, springlike action that's usually off-limits to plant tissue.

Plant motions are typically slow, notes study coauthor Lakshminarayanan Mahadevan of Harvard University, a mathematician who specializes in mechanics. Many botanical movements take place as plants' internal plumbing systems gradually redistribute water among cells. However, a flytrap's snap requires motions at least 10 times as fast.

In 2003, Mahadevan and his coworkers began investigating the plant's quick motion when they were at the University of Cambridge in England. The researchers had become fascinated with a Venus flytrap that was sitting in a flowerpot in their shared office.

"I was watering it. We started talking about it," recalls Jan M. Skotheim, now at Rockefeller University in New York City.



FORTERRE ET AL./NATURE

OPEN AND SHUT CASE Tickling the inner surfaces of an open Venus flytrap (top) causes mechanical tension to build in the leaves until they buckle and snap shut (bottom).

Soon, the researchers were painting reference dots of fluorescent paint onto curved flytrap leaves and taking high-speed videos of snapping traps. The researchers also used a microscope to accurately measure leaf stretching.

Now, a fast-action picture of the flytrap's capturing mechanism has emerged.

First, the cells in the outer surface of each open leaf elongate, Mahadevan and his colleagues report. An insect or another object landing in the trap stimulates hairs that then trigger pumping of fluid into the outer cells. Meanwhile, the leaves' inner surfaces don't change.

That uneven elongation puts mechanical pressure on the leaves to bend inward, says team member Yoël Forterre, now at the University of Provence in Marseille, France. But the open leaves are curved in such a way that they resist the bending force. As a result, tension grows in the leaves.

The team's measurements show that after nearly 1 second of buildup, the leaves can resist no more. Suddenly, their shape becomes unstable and they buckle, flipping into their cupped, closed form.

An elastic mechanism for the flytrap's snap "is the right explanation," comments mechanical engineer Julian F.V. Vincent of the University of Bath in England.

"This is a convincing demonstration of a most unusual application of mechanical instability in plants," adds Charles R. Steele of Stanford University.

It's likely that other rare, fast plant motions—including the explosive spewing of seeds by species such as the squirting cucumber—depend on similar mechanisms, Mahadevan says. It may even be possible for people to adapt the process to technological uses such as sensors or novel valve mechanisms in microfluidic devices, he adds. —P. WEISS

Hungry for Hydrogen

Microbes in hot springs feed on unlikely source

Visitors to Yellowstone National Park's geothermal springs are struck as much by the stench as by the landscape. The sulfur compounds emanating from the springs bear a rotten-egg odor, and they have long been regarded as a major source of energy for the springs' rich community of microorganisms. New research, however, suggests this positive spin on sulfur may be overblown. Most microorganisms in the springs seem to live off hydrogen, scientists report.

To find out what kinds of microbes inhabit these extreme environments, where water temperatures can surpass 70°C, researchers at the University of Colorado at Boulder collected bacteria-bearing sediment samples from Yellowstone's geothermal system. Then, the team sequenced some of the microbes' genes. Much to the researchers' surprise, the sequences in most of the microbes closely resembled those of hydrogen-metabolizing bacteria that had been characterized elsewhere.

With extensive measurements, the researchers also determined that molecular hydrogen is abundant throughout the geothermal system. "These are the first systematic measurements of hydrogen in Yellowstone's springs," says lead investigator Norman Pace.