**A BROAD VIEW OF
QUAKE 'PREDICTION'**
Wide mapping of stress
helps to pinpoint when and
where the Earth will crack.
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PUNCHSTOCK

C. GUTIERREZ/UPI PHOTO/NEWSCOM

SNAPSHOT

Charged clouds

The Chaitén volcano in southern Chile erupts after more than 9,000 years of dormancy, spewing ash some 30 kilometres into the sky. Its plume stretches hundreds of kilometres across neighbouring Argentina to the Atlantic Ocean. The eruption has blanketed the surrounding province with a layer of soot, forcing the evacuation of thousands of people and threatening to bury the town of Chaitén, ten kilometres away. The spewed gases are high in silica and low in sulphur particles, so the eruption is unlikely to have a large effect on the climate.

For decades, scientists observing eruptions have seen lightning of the sort pictured here, but its origins are still not well understood. A study of an Alaskan volcano found that the ash particles spewing from the mouth of its crater were highly charged (R. J. Thomas *et al. Science* 315, 1097; 2007). Experts think that similar particles are behind these 'dirty thunderstorms'.

Geoff Brumfiel

A side-splitting tale

Researchers who used a device to simulate human copulation report that more than 90% of condom breakages occur when the sheath is stretched repeatedly in the same place without returning to a relaxed state between stretches.

International standards for condom testing require two evaluations of the tensile strength of the condom material. One measures how far a ring of the material elongates when stretched between two rollers; the other involves inflating a condom until it bursts and recording the pressure and volume at which that happens.

But a sticky problem remains: clinical trials have reported failure rates of around 1% due to breakage, but the sample sizes were too small to reliably indicate why the devices break. Laboratory tests of condoms made of varying thicknesses and materials have done a poor job of duplicating real-world splitting, making it difficult to design safer condoms.

Now, a team led by Nicholas White, head of quality control at SSL International in Cambridge, UK, which owns major condom brand Durex, has attempted a more realistic model of sex with a condom, using a device with an adjustable 'thrust-hole' diameter, thrust rate and lubrication.

First the team used a microscope to examine the breaks in 972 male condoms made of latex or polyurethane that were returned to the company between 1998 and 2005 by dissatisfied customers. More than 60% of these condoms were broken at the closed end, often with an outwards circular rupture that the research calls an 'eruption', where there had been no manufacturing flaw in the condom film, nor any evidence of misuse.

The researchers replicated this breakage pat-

tern by altering the parameters of their device so that the test condoms were progressively stretched at the tip during repeated thrusting. As expected, latex, from which the vast majority of condoms are made, showed a better elastic recovery than polyurethane, which is thinner and used in more expensive condom products. Yet both materials tended to break in the same way, irrespective of their elasticities (N. D. White, D. M. Hill and S. Bodemeier *Contraception* 77, 360–365; 2008).

"Just about the only thing that humans aren't strong enough to break, that is also thin and flexible enough, is parachute nylon — but that's porous," comments White. He hopes that the research will help in the design of condoms that can better withstand eruptions.

"Given the importance of condoms in stopping sexually transmitted infections as well as unwanted pregnancy, research to understand and then eliminate breakages is vital," says Lisa Power, head of policy at the Terrence Higgins Trust, an HIV charity in London, UK. "The safer we can make them, the happier a lot of people will be."

Anna Petherick

An apparatus simulating sex was used to test condoms.