The university is setting up an independent, not-for-profit institute to handle requests. Gearhart has said he will decide whether to distribute his cells to other researchers once final guidelines are in place.

The NIH's proposal could still run into trouble in Congress, however. Many observers expected the controversy to explode this fall. Representative Jay Dickey (R–AK) had proposed to amend NIH's appropriation bill specifically to bar work on embryo-derived cells. At the same time, a Senate advocate of stem cell research, Arlen Specter (R–PA), had proposed language that would be more permissive than NIH, permitting researchers to derive cell lines from human embryos as well as use them. Congressional leaders prevailed on both legislators to withdraw their proposals, however, and the appropriations bill signed into law last week is silent on the issue. As part of the compromise, Senate Majority Leader Trent Lott (R–MS) has promised a debate on Specter's bill in February. Both sides are gearing up.

In the meantime, NIH is accepting public comment on the draft guidelines through the end of January. Once the final version is in place, NIH will begin accepting proposals for work on both embryonic and fetal stem cells, says Lana Skirboll, the NIH's associate director for science policy. Barring congressional intervention, she predicts the first grants could be funded as soon as next spring.

–GRETCHEN VOGEL

PLANETARY SCIENCE

Yet Another Loss to The Martian Gremlin

Failure at Mars is becoming drearily familiar: Since 1960, the United States, the Soviet Union, and Russia have launched 29 missions toward Mars, only eight of which could be called real successes. The dogged Russians and Soviets are zero for 16, engendering talk of a martian gremlin that lies in wait for unsuspecting spacecraft. Until this year, however, the Americans seemed to have dodged the gremlin, with an impressive eight successes out of 11 attempts. But in September confusion over English and metric units doomed Mars Climate Orbiter. And over the past weekend the Mars Polar Lander (MPL) went missing, giving the United States just two successes in the last five tries.

While scientists mourned the loss of a chance to study martian water ice up close, mission planners at NASA and the Jet Propulsion Laboratory (JPL) in Pasadena, California, were at least as discouraged by the prospect that they may never know what sealed MPL's fate. In the wake of the loss, they offered two scenarios. MPL could have reached the surface intact but landed on a slope so steep that it tipped over. Or, just after it broke off radio communication with Earth, as intended, 12 minutes before its planned landing, it could have suffered some onboard problem—perhaps due to some undiscovered flaw in current designs that might turn upcoming Mars missions into gremlin bait as well.

CREDIT: NASA/JPL/CALTECH

Lost duo. Why Mars Polar Lander became the year's second martian casualty, after Mars Climate Orbiter *(top)*, may never be known.

A complex sequence of mechanical operations was scheduled after the communications break. Outside Mars's atmosphere, MPL should have separated from a structure that had supported it during the cruise to Mars. It should have made a fiery entry behind its heat shield, deployed its parachute, jettisoned the heat shield, radar-locked onto the surface, and separated from the parachute. Then, using rockets to decelerate, it should have made a gentle touchdown on the surface.

With no word from the lander, engineers don't know how any of that went. MPL had no way of communicating during its entry, descent, and landing, unlike its predecessor Mars Pathfinder, which landed successfully in 1997. Pathfinder's mission, notes project scientist Matthew Golombek of JPL, was to test a new airbag-cushioned landing method, so mission engineers documented spacecraft performance to the very end. In the case of MPL, spacecraft designers economized by leaving out the somewhat complex and expensive equipment needed for continuous communications. After all, two Viking spacecraft had successfully made rocket-braked landings on Mars in 1976, using much older technology.

Even if MPL did make it down, other hazards awaited it. Like all other landings on Mars, it would have touched down on little-known terrain. According to Richard Zurek, MPL project scientist at JPL, images of the landing zone made by the orbiting Mars Global Surveyor showed a relatively smooth surface. But because a picture element in most of those images encompasses 4 meters, plenty of lethal hazards—car-sized potholes or meter-high ledges, for example—could be hiding in the apparently innocuous terrain. "We can't capture [lander-scale hazards] with the images we have," says Zurek. "That's a risk you take when you go to Mars. We're going to places on Mars we haven't been before. You can't guarantee success."

–RICHARD A. KERR

TISSUE ENGINEERING

Growing Human Corneas in the Lab

If the eyes are the windows to the soul, the cornea is the windowpane, a tough but transparent layer of tissue that lets light through but protects the interior of the eye from the elements. But although a smudged window is easy to clean, a cornea clouded by injury or disease can impair vision and lead to blindness. Surgeons can often replace damaged corneas with healthy ones from organ donors. But the supply barely meets the demand, and few corneas remain for researchers, who need them to study corneal wound healing and eye diseases. That leaves none for toxicity testing of drugs and household products. As a result, manufacturers often test them on animals, usually rabbits. Now, researchers have taken a big step toward alleviating the cornea shortage.

On page 2169, cell biologist May Griffith of the University of Ottawa Eye Institute, Mitchell Watsky of the University of