one for conflicts before it can be received.

Zerhouni said he is taking these steps even though the new rules, which go far beyond those in academia, could cause harm: “For sure, we will have people who will leave the agency,” he warned, adding that recruiting may become more difficult. Subcommittee chair James Greenwood (R-PA) said he is “very pleased” with the changes.

But the committee continues to seek information about past NIH activities and finds some new evidence troubling. Committee staffers asked 20 major drug companies to report payments to NIH employees. According to the committee, which has not yet released the data, this list of 264 contracts includes about 100 deals that do not appear in a spreadsheet of consulting activities compiled by NIH. NIH spokesperson Don Ralbovsky says the agency thinks that “many of the cases will prove to be OK.” Some were likely approved, he says, but did not show up in records kept by institute ethics offices, and others may be activities that NIH did not count as company payments.

NIH is looking closely at one controversial case: Pfizer Inc. in New York City reportedly to the committee that it has paid Trey Sunderland, a scientist at the National Institute of Mental Health, more than $517,000 since 1998, according to Greenwood’s opening statement. Sunderland apparently did not seek approval for this activity or report it to NIH, Greenwood said. Zerhouni, who was informed of this case 4 days before the hearing, said the agency’s “preliminary evaluation” has led to “grave concern” that Sunderland may not have followed required procedures. Sunderland did not respond to e-mail or phone messages from Science.

Staffers have also been poring over testimony from an NCI and an FDA scientist who consulted for a competitor of a company with which NIH had a cooperative research agreement (Science, 28 May, p. 1222). Some committee members played audio clips from an 18 May hearing, including one in which NCI’s Lance Liotta testified that his agreement with the company, Biospect Inc. in South San Francisco (now Predicant Biosciences), had been “placed on hold” since February 2004. The panel then showed slides of monthly paycheck slips received by Liotta until 1 May. An attorney for Liotta says the committee misinterpreted his testimony.

The investigation appears nowhere near winding down: The panel is preparing more findings on another NCI matter and recently asked 15 other agencies to describe their employees’ consulting activities. –JOCELYN KAISER

N E W S  O F  T H E  W E E K

Signs of Ancient Rain May Stretch Mars’s Balmy Past

In the evolving debate over water on Mars, the Hesperian epoch of middle martian history is a dividing line. Planetary scientists agree that before the Hesperian, in the first billion years of the planet, water flowed on the surface, cutting valleys and eroding impact craters. This time of relatively abundant surface water on Mars ended as life was appearing on Earth. Since the end of the Hesperian, what water remained on the frigid martian surface has almost always been locked up as ice.

But on page 78, planetary geologist Nicolas Mangold of the University of Paris South in Orsay and colleagues report the discovery of dense networks of rain-carved valleys dating from near the end of the half-billion-year-long Hesperian, when geologists believe that Mars was completely iced up. “It’s a really exciting paper,” says planetary geologist Oded Aharonson of the California Institute of Technology in Pasadena. It’s also provocative, he adds. Running water no doubt cut the valleys, he and others agree, but the role of rain and its exact timing, like so much else about water on Mars, will be debated.

The unmistakable signs of flowing water show up in images from the Thermal Emission Imaging System (THEMIS), which has been scanning the planet since October 2001 from the orbiting Mars Odyssey spacecraft. Mangold and his colleagues present two areas of treelike networks of valleys carved into the high ground above and draining into the great canyons of Valles Marineris. The branching valleys are as closely packed as those of typical drainage systems on Earth, they note, in contrast to the sparse valley networks usually reported on Mars. Some valleys run right up to ridge crests, which rules out spring-fed streams, because not enough groundwater could have accumulated there to create springs. And the valley networks are continuous and leave no blank areas, suggesting that the water was not flowing beneath snow or ice. “They’re really best explained by rainfall,” says Mangold.

This rain was still falling on Mars—episodically, at least—late in the Hesperian, according to Mangold and colleagues, despite the supposed long-term chilling. They point out that the surface cut by the valleys has been dated to the late Hesperian by a count of the craters formed by the steady drizzle of impactors since the valleys were cut. And the northern end of one drainage area was later covered by lava dated by crater-counting to the early part of the next epoch, the Amazonian. “I think the age is really well constrained by stratigraphic relations,” says Mangold.

Other planetary geologists have no doubts about the water, but they are less sure about when it was there. Mangold and colleagues based their age estimates in part on a 1992 paper that reported crater counts over many regions of Mars, says planetary geologist Gerhard Neukum of the Free University Berlin. “It may not be so late [in the] Hesperian as they think,” he says. Kenneth Tanaka of the U.S. Geological Survey in Flagstaff, Arizona, the first author on the 1992 crater-counting paper, agrees. Additional “crater counts would make us feel more comfortable” about a late Hesperian age, he says.

Some researchers suspect that the water might have been meltwater flowing under snow or ice rather than rainwater. Martian climate could have been much colder then—perhaps as cold as today, says planetary geologist James Head of Brown University in Providence, Rhode Island. Mars could have been tipped farther over on its axis, as it is known to have been at times (Science, 11 April 2003, p. 234), so that the ice now at the poles fell as snow on the equator. When the planet tilted more upright again, the snow and ice would have melted. Melting snow or ice could have sculptured the landforms THEMIS spotted, says Aharonson. Images already in hand from the High Resolution Stereo Camera on board the Mars Express orbiter may resolve these uncertainties in the coming months.

–RICHARD A. KERR

PLANETARY SCIENCE

Signs of Ancient Rain May Stretch Mars’s Balmy Past

Rain drain? Water cut dense valley networks in middle Mars history.