Dispatches from the void

NASA probes beam a wealth of data to Earth

IT HAS been an up-and-down year for America's space agency, NASA. While the space shuttle has been dogged by delays and safety concerns (if all goes well, "return to flight", as the NASA spin machine dubs the next shuttle mission, should happen on July 13th), the agency's unmanned missions have been unmitigated successes.

On July 4th NASA's cometry probe Deep Impact lived up to its name by knocking a hole in comet Tempel 1 (picture right) and creating a plume of gas and dust that researchers back on Earth are now analysing. Meanwhile, half a dozen papers have been published in Nature, summarising the findings of Spirit and Opportunity, two robot rovers that have been trundling over the surface of Mars since January 2004, which is 15 months longer than planned.

The question everybody wants to answer, of course, is "is there life on Mars?" The rovers were not designed to address that question directly. But they were definitely intended to ask whether there had ever been enough water lying around for life as known on Earth to have emerged. Indeed, Spirit's landing site, Gusev crater, was chosen because it looked as though the crater might once have contained a lake.

Unfortunately, that turned out not to be the case. Spectroscopic analysis of Gusev's rocks suggested that, rather than originating in an ancient lakebed, they were of volcanic origin. That does not mean there was never any water at all in the crater, though. One of the research groups writing in Nature concluded that highly acidic water had once been present in Gusev, probably in the form of thin films, and that it interacted with the volcanic rocks there, leaving behind tell-tale minerals. But it is unlikely that there was ever enough of this water to form pools—in contrast to previous reports from Opportunity's landing site, where the presence of haematite, an iron-oxide mineral that often forms in the presence of water, suggests there had, indeed, once been pools.

How widespread those pools were, though, is a moot point. The presence in Martian dust of a mineral called olivine, which disintegrates rapidly in the presence of water, suggests that even if liquid water was ever widespread, it was not around when the rocks from which the dust formed were created.

All of which goes to show that although the rovers have worked better than could reasonably have been hoped for, studying a couple of random spots on the surface of a planet is likely to raise as many questions as it answers. Which, if America's taxpayers remain willing, is good news for Martian scientists, who will thus remain employed for years to come.

There was even enough of this water to form pools—in contrast to previous reports from Opportunity's landing site, where the presence of haematite, an iron-oxide mineral that often forms in the presence of water, suggests there had, indeed, once been pools.

How widespread those pools were, though, is a moot point. The presence in Martian dust of a mineral called olivine, which disintegrates rapidly in the presence of water, suggests that even if liquid water was ever widespread, it was not around when the rocks from which the dust formed were created.

All of which goes to show that although the rovers have worked better than could reasonably have been hoped for, studying a couple of random spots on the surface of a planet is likely to raise as many questions as it answers. Which, if America's taxpayers remain willing, is good news for Martian scientists, who will thus remain employed for years to come.