ask Afghans and the world's Muslims to use their sound wisdom," Taliban chief Mullah Mohammed Omar was quoted as saying on 4 March on official radio. "Do you prefer to be a breaker of idols or a seller of idols? Is it appropriate to be influenced by the propaganda of the infidels?"

As *Science* went to press, the destruction of the Buddhas had begun. Government officials also boasted that two-thirds of the thousands of offending objects had been smashed. Nevertheless, a special envoy from the United Nations was trying to broker a solution, and other Islamic nations expressed outrage over the decree. –ANDREW LAWLER

ASTROBIOLOGY

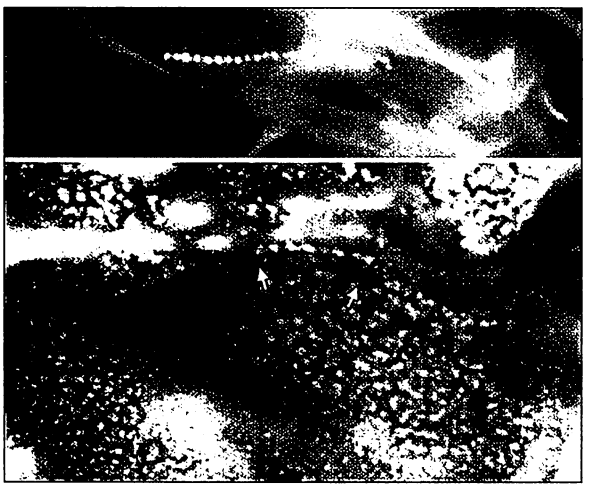
Are Martian 'Pearl Chains' Signs of Life?

Life on Mars jumped back into the headlines last week with the publication of two papers claiming that nanoscale mineral grains in the famous martian meteorite ALH84001 were left by ancient martian bacteria. One paper was old news to researchers (*Science*, 22 December 2000, p. 2242). The other got a generally cautious reception when it was reported in the media, but now many experts are turning downright incredulous as they get a chance to inspect the published images. One of the two papers "defines a new low in the great ALH84001 debate," says microscopist John Bradley of MVA Inc. in Norcross, Georgia, a longtime critic of martian microbe claims. Even the fence sitters are unimpressed: "There's a lot of subjectivity" in the analysis, says geologist Allan Treiman of the Lunar and Planetary Institute in Houston. "They've gone too far in interpreting the images" as signs of life.

Meteorite ALH84001 first made headlines in 1996, when a group of researchers claimed that the chemical, mineralogical, and isotopic makeup of the meteorite—and some buggy-looking microscopic features—spoke of ancient life back on Mars. All but one of those lines of evidence have been withdrawn or discounted as not definitive, singly or collectively. The remaining evidence is grains of the iron-oxide mineral magnetite a few tens of nanometers in size, the same sort of particles that some earthly bacteria form, stringing them into long chains to make magnetic compasses.

In one of the 27 February *Proceedings of the National Academy of Sciences* (*PNAS*) papers, microscopist Kathie L. Thomas-Keprta of Lockheed Martin in Houston and colleagues argue that about one-quarter of ALH84001's magnetite is indistinguishable from the magnetite of a particular terrestrial magnetotactic bacterium, and therefore the martian magnetite probably has a bacterial origin, too. Thomas-Keprta made the same argument in another paper late last year. Other researchers agreed about the resemblance but concluded that the evidence was not extraordinary enough to prove such an extraordinary claim.

Now comes the claim that some of ALH84001's magnetite is arranged in chains like pearls on a string, just the way some bacteria form magnetite on Earth. In the second *PNAS* paper, Imre Friedmann of NASA's Ames Research Center at Moffett Field, California, and colleagues present scanning electron microscopy (SEM) images of what they believe are chains of magnetite grains produced by bacteria. In a mode of SEM operation that highlights heavy elements such as iron, images show bright blobs of presumably iron-rich material lined up across the surface. "The chains we discovered are of biological origin," says Friedmann, because the fuzzy blobs have a uniform size and shape within a chain, have consistent gaps between them, are aligned end to end when elongated, and can bend in curved chains, just like magnetite chains of earthly bacteria.



The real thing? Iron-rich blobs seem to form chains in a martian meteorite (bottom) that resemble the magnetite chains of earthly bacteria (top).

CREDIT: I. FRIEDMANN/NASA AMES RESEARCH CENTER

Initial news reports quoted vague reactions from experts who had yet to see the images or had seen them in faxed versions only, but the real McCoys are getting a decidedly cool reception. Microscopist Peter Buseck of Arizona State University in Tempe is among the most receptive. "It's an interesting paper," he says. "I have no problem dismissing some of the [chains]. There are others that seem to come close to a real [bacterial magnetite

ScienceScope

Can-Do Genome Canadian genomics research kicked into a higher gear last week as the federal government increased its contribution to a national genomics initiative by $95 million, to $202 million. "Genomics promises tremendous quality-of-life benefits for all Canadians, especially in health, and will be a key economic engine in the 21st century," said Industry Minister Brian Tobin in a news briefing.

The contribution will bring Genome Canada closer to its target of $400 million (*Science*, 10 March 2000, p. 1732). The program has already collected $160 million from the provinces and the private sector, with the rest expected over the coming year. The governing board is reviewing 31 projects that have survived an initial review and hopes to announce the winners after its next meeting on 23 March.

The additional funds should make more scientists happy, says chief executive officer Martin Godbout. He says it will also help Canada keep up "not just in sequencing, but the next step, which is functional genomics."

Training Tumult The National Institutes of Health (NIH) is about to propose new guidelines on training graduate students and postdocs that it hopes will defuse growing criticism of current policies. Last August, a National Academy of Sciences panel recommended that NIH fund more young researchers through general training grants, and fewer through research grants to specific investigators, as a way to improve the quality of their education without increasing the competition for jobs (*Science*, 8 September 2000, p. 1667). Last week, some of the same issues were debated as the academy held a day-long symposium to promote a September report that fingered NIH's current training stipends as contributing to the economic plight of postdocs.

NIH officials say the new guidelines, the product of a lively 6-month debate on the Bethesda, Maryland, campus, aim to balance the educational needs of students and the research requirements of investigators. But the issue of raising salaries is complex, says Marvin Cassman, director of the National Institute of General Medical Sciences, who was under fire at last week's symposium from both angry postdocs and harried administrators. Any boost in stipends, he noted, would lower the number of students and postdocs NIH could support, unless Congress or administrators substantially increase the agency's training budget.

quate access to key documents related to the allegations and had not been given the opportunity to respond before the report was made public. He stated that he had not yet read the report but would defend himself "against any allegations." Mertelsmann could not be reached for further comment.

At a 1 March press conference, university rector Wolfgang Jäger said he has asked the state of Baden-Württemberg's Research Ministry to initiate a disciplinary proceeding "to clarify the extent of [Mertelsmann's] personal responsibility" for the questioned research. A spokesperson for the ministry, which is not obliged to launch such a proceeding, says a decision is expected in the next few weeks.

Meanwhile, the Freiburg medical center's supervisory board has asked Mertelsmann to withdraw voluntarily from clinical research for the duration of any disciplinary hearing. Jäger said no further actions are necessary, because the center and its faculty have taken steps—such as adopting stricter rules of conduct—to safeguard research integrity.

–ROBERT KOENIG

QUANTUM CHROMODYNAMICS

Quark Quirk Triggers Nuclear Shrinkage

If atoms had egos, a few lithium nuclei would be nursing bruises right now. By sticking an exotic type of quark where it doesn't belong, physicists have cut the nuclei down to four-fifths normal size. In the process, the scientists are edging toward a theory that can explain nuclear interactions of all varieties.

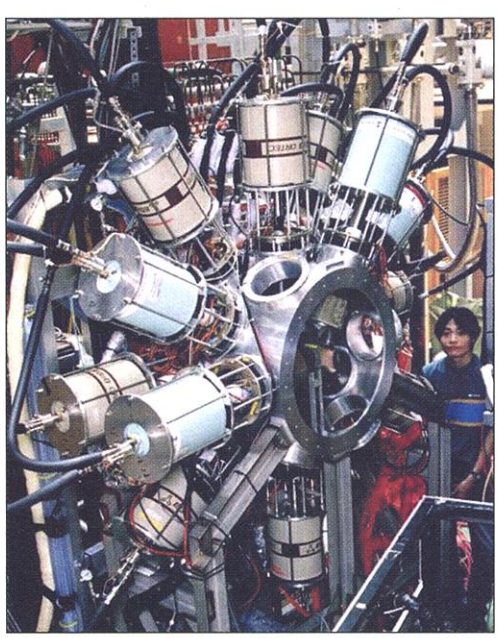
"Shrinkage of about 20% is very surprising," says Hirokazu Tamura, a physicist at Tohoku University in Sendai, Japan. "Nuclear physicists know that compressing the nucleus is very, very difficult."

So instead of trying to squeeze an atomic nucleus, Tamura and colleagues from Japan, China, Korea, and the United States set out to shrink it from within. In the 5 March *Physical Review Letters*, the physicists describe how they injected a little dose of strangeness into a lithium-7 nucleus. Through a handful of particle interactions, they substituted a strange quark for a down quark, turning one of the atom's neutrons into a particle called lambda, or Λ. "It's quite similar to the neutron, but somewhat heavier," says John Millener, a physicist at Brookhaven National Laboratory in Upton, New York. "A proton is two ups and a down, a neutron is two downs and an up, and a Λ is an up, a down, and a strange." The quark substitution turned lithium-7 into lithium-6-Λ, a so-called "hypernucleus" with subtly different properties from a garden-variety lithium nucleus.

The difference stems from the Pauli exclusion principle, the quantum-mechanical rule that forbids certain particles from having the same quantum state. Given the chance, a neutron in a nucleus will occupy the lowest possible energy level, or ground state. Two neutrons can inhabit that level, but only if they have different quantum states. For that to be true, one neutron must have spin +1/2, and the other must have spin –1/2. A third neutron, however, must take a higher energy position farther away from the center of the atom. The same exclusion rules apply, independently, to protons.

Lithium-6 has three protons and three neutrons; one proton and one neutron are in the higher energy state, loosely bound to the core. Enter the Λ. Because a Λ particle is distinct from both protons and neutrons, it is exempt from the Pauli exclusion principle that governs those particles. As a result, it sinks directly into its ground state, joining the low-energy protons and neutrons at the center of the nucleus. "You put the Λ in the system, and it makes everything more stable by interacting with the [protons and neutrons]," Tamura says. The extra Λ binds the particles more tightly together but, unlike an added proton or neutron, takes up no additional space. The stabilized nucleus shrinks.

Tamura's team observed the shrinkage by precisely measuring gamma rays that emanate from lithium-6-Λ hypernuclei. The gamma rays reflect the shifting of particles' spins within hypernuclei—information that can help scientists determine not only a hy-

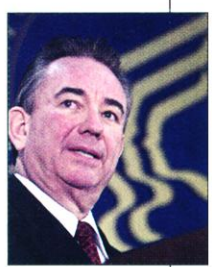


Squeeze play. Gamma rays entering the 14 spokelike detectors of Tohoku University's Hyperball instrument showed evidence of pint-sized lithium nuclei.

CREDITS: (LEFT TO RIGHT) DEPARTMENT OF PHYSICS, TOHOKU UNIVERSITY; U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

ScienceScope

Stem Cell Limbo Those hoping for clear signals about the status of U.S. government funding for human embryonic stem cell research were disappointed last week. Secretary of Health and Human Services (HHS) Tommy Thompson (below) told reporters and National Institutes of Health (NIH) staff gathered for a 1 March budget briefing that the legal questions surrounding the cells are still "a little murky, because Congress has passed a law" that forbids NIH from funding work that harms or destroys an embryo.



In 1999, an HHS lawyer reasoned that work could go forward because embryonic stem cells—valued because they can be coaxed to grow into a variety of cell types—are not themselves embryos. But that opinion "has been questioned by other lawyers," Thompson said, and the department is reviewing the matter. If the Administration decides it is legal to go ahead, the review won't hold up funds, he vowed. The next deadline for researchers to submit proposals for stem cell work is 15 March, but ethics and science reviews mean scientists won't receive awards before June, said NIH acting director Ruth Kirschstein.

Meanwhile, lobbying on the volatile issue continues. The American Association for the Advancement of Science (*Science*'s publisher) this week sent Thompson a letter urging him to let stem cell funding proceed.

Russelling Up Staff The Bush White House has made its first science-related job appointment. It's Richard Russell, a former House Science Committee senior staffer, who this week took up residence as the White House Office of Science and Technology Policy's (OSTP's) chief of staff.

Russell spent 6 years on the Science Committee, where he handled an array of issues, and also helped with the Bush Administration's transition efforts at the Department of Commerce and the National Science Foundation. Before going to OSTP, rumors had him in the running for a senior Commerce post overseeing the National Oceanic and Atmospheric Administration.

Russell's duties—and longevity—at OSTP are unclear. Researchers are still anxiously waiting for the White House to name a new science adviser, who also heads the office and could bring in his own team.

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