



**Field of nightmares?** A British TV thriller has stirred up the controversy over GM crops.

profile attack last week. Leading the charge was Robert May, president of the Royal Society, the U.K.'s preeminent scientific body. "Fields of Gold," he said in a statement, is "ludicrous" and "hysterically inaccurate" and is "propaganda."

The vehement protests included calls for BBC to pull the program before it aired. BBC did not comply, although it posted on one of its Web science pages what could be construed as a disclaimer about the show's premise, noting that "most scientists think that the risk to our health from this is remote."

The program was scripted by Ronan Bennett, known for his politically charged fiction about Northern Ireland, and Alan Rusbridger, an editor at *The Guardian*, a highly respected left-leaning U.K. newspaper. Last summer, the two asked University of Cambridge geneticist Mark Tester to vet their script. Tester provided suggestions to make the script more plausible, including a possible means for mixing GM wheat with the bacteria. But he harshly criticizes the accuracy of the final product, especially the ease with which the fictional farmer transfers the gene into the plant and the highly improbable transfer of the resistance gene from the wheat into bacteria. The program, he told *Science*, "raises concerns that have no scientific basis."

Bennett says that he and Rusbridger rewrote some scenes according to Tester's advice. Moreover, he says it was Tester who brought the idea of horizontal gene transfer to their attention in the first place. When Tester reviewed the script, Bennett says, "he did not take objection to any of it, he just made suggestions." Indeed, in an e-mail to the BBC in July 2001, Tester said he remained "open-minded" about the gene transfer scenario. As for the demand for the show's cancellation, Bennett says, "it has a whiff of book burning about it." Rusbridger claims that many scientists gave positive feedback. He also points out that U.K. officials have expressed concern over horizontal transfer in government documents.

Despite the scant research on horizontal transfer of transgenes, several scientists who

saw the program agree that it is implausible. "If genes moved with any frequency from plants to bacteria, we'd find them in bacterial genomes. We don't," says Peter Lund, a molecular biologist at the University of Birmingham, U.K. An outbreak of vancomycin-resistant bugs, Lund and others say, is much more likely to come from existing resistant bacteria than from a plant.

But Lund adds that the show reflects real concerns among Britons: "We have no trust in politicians or big business, and very limited trust in or understanding of science." Even a critic from the conservative *Times* of London sympathized with the urge to confront the dangers of GM crops: "The public have been taught fear and skepticism not by radical agitators but by businessmen and their political allies, who were prepared to take irresponsible risks with our health."

The show's anti-GM message comes at a particularly inopportune time for the U.K. government, which announced last week that it would sponsor televised national debates on GM food safety this summer. Few, however, believe that television, whether in the form of public debate or a GM thriller, will reconcile such bitterly opposed viewpoints.

—BEN SHOUSE

Ben Shouse is a writer in New York City. With reporting by Adam Bostanci in Cambridge, U.K.

## ECOLOGY

### A Coral by Any Other Name ...

Although the undersea landscape is peppered with corals of many shapes and sizes, there's no consensus about whether the different configurations denote different species. Some researchers think so and call each by a different name. But others argue that because many corals interbreed, they do not qualify as distinct taxonomic entities. Now on page 2023, Harvard University researchers say they have set the record straight, at least for three species found in the Caribbean. By performing more extensive genetic studies than



**All in the family.** When elkhorn coral (right) eggs are fertilized by staghorn coral (middle) sperm, a bushy hybrid (left) results.

**One of Their Own** An in-house geologist has taken the helm of the Smithsonian's troubled National Museum of Natural History in Washington, D.C.—at least temporarily. Until a permanent director is found, Douglas Erwin, an expert in ancient mass extinctions, will be in charge of the museum's research program, which some scientists say is threatened by changes proposed by Smithsonian chief Lawrence Small (*Science*, 14 September 2001, p. 1969).

Erwin, chair of the museum's paleontology department, steps in for Dennis O'Connor, who left last month for an academic post. O'Connor served just 7 months after replacing Robert Fri, who left last year in part because of disagreements with Small.

University of Pennsylvania anthropologist Jeremy Sabloff, who heads a committee evaluating Smithsonian science, is pleased with Erwin's appointment, as well as that of Irwin Shapiro—head of the Smithsonian Astrophysical Observatory—who last month became undersecretary for science. Given the turmoil, "having strong voices for science is absolutely necessary," Sabloff says. But he notes that a search committee is already writing a job description for Erwin's replacement.

**MIT Reports on Secret Science** After a 3-month study, a faculty committee at the Massachusetts Institute of Technology (MIT) this week recommended that the school retain rules that bar classified research from campus. But the panel said the university should establish a new committee to track evolving government rules on scientific secrecy and consider expanding off-campus laboratories to handle expected growth in classified work.

MIT leaders ordered the report last February, after some universities reported that federal funders were pressuring them to restrict some basic research in the wake of the 11 September terrorist attacks (*Science*, 22 February, p. 1438). Most schools ban secret work from campus and bar prior government review of basic science results.

In its 50-page report, the panel—led by engineering professor Sheila Widnall—reaffirmed MIT's commitment to "an open research environment" on campus. But it predicted that MIT's classified work—done at affiliated Lincoln Laboratory—will grow. In particular, the panel said "it is not too hard to imagine" a new lab for secret biological research. MIT officials say the report will help guide the use of such facilities.

**Contributors: Pallava Bagla, Robert F. Service, Elizabeth Pennisi, and David Malakoff**

had been tried before on corals, Harvard marine biologists Steven Vollmer and Stephen Palumbi have shown that appearances can be deceptive: Three “species” are really two.

The work is as noteworthy for its techniques as for its findings. Harilaos Lessios, an evolutionary biologist at the Smithsonian Tropical Research Institute in Panama, describes the study as “a first-rate application of molecular markers to solve an evolutionary problem that morphology and conventional crosses between gametes were unable to solve.” Although not everyone agrees, Lessios thinks the results will clarify when a particular coral is a separate species.

Coral experts had suspected that many coral species were promiscuous. In a maritime orgy, dozens of corals release their gametes on the same few nights once a year. Occasionally, sperm of one species pair with eggs of another and hybrids result—at least that’s what lab tests indicate. But whether hybrids survive, or, more important, whether they can reproduce sexually, has been a matter of debate. If they can reproduce sexually with other hybrids, they have the potential to split off as new species, thereby contributing to the evolution of these organisms.

Vollmer and Palumbi evaluated DNA from three *Acropora* “species”: staghorn, elkhorn, and *Acropora prolifera*, sometimes called fused staghorn. They focused on some noncoding sequences, or introns, from two genes and also some mitochondrial DNA. As expected in species, the mitochondrial DNA and the introns in both copies of each gene in the elkhorn were readily distinguishable from the staghorn’s. But *A. prolifera* had one copy of each gene from each of the two species, indicating that *A. prolifera* is a first-generation descendent of elkhorn and staghorn corals.

The relatively recent origin of the hybrid was unexpected and suggests, at least to Vollmer and Palumbi, that *A. prolifera* doesn’t warrant designation as a separate species. Had hybridization occurred long ago and the hybrid reproduced sexually, as some researchers suspected, then *A. prolifera* might have had time to evolve into its own species. Alternatively, others expected that the elkhorn and staghorn corals interbreed so much—with each other and with the hybrids—that their genomes would be too similar for biologists to call them separate species.

But neither hypothesis is quite correct, say Vollmer and Palumbi. Because this hybrid only very rarely reproduces sexually, it seems to be an evolutionary dead end even though it can live a long time and propagate asexually. Vollmer calls it an “immortal mule.”

But not everyone is convinced about this interpretation. “How common [these first-generation hybrids] are going to turn out to be is hard to know,” cautions Nancy Knowlton of the Scripps Institution of Oceanography in La

Jolla, California. Bette Willis, a coral expert at James Cook University in Townsville, Australia, points out that the new data indicate that some interbreeding occurs between the hybrid and its parents, so the results actually support the idea that corals tend to be too intermingled to qualify as separate species. Contrary to what Vollmer and Palumbi say, “the paper adds to a growing body of evidence that [interbreeding] has played a role in the evolutionary history of the coral genus [with the most species], *Acropora*,” she suggests.

Figuring out what makes a coral a distinct species is not just academic, Vollmer, Palumbi, and others say. As Richard Aronson, a marine biologist and paleoecologist at the Dauphin Island Sea Lab in Alabama, points out, clarifying what is a species that can reproduce sexually can help conservationists decide which corals to protect.

—ELIZABETH PENNISI

## ARCHAEOLOGY

### Millions Pledged for Afghan Restoration

Afghan leaders are gathering this week in Kabul to map out the country’s political future. Two weeks earlier, international donors met in the capital city to confront another daunting challenge—restoring Afghanistan’s cultural and archaeological heritage after 23 years of strife. The meeting, blessed by the interim government and the United Nations Educational,



**Gutted.** Kabul Museum is in ruins, but researchers saved a few statues like this one from Fondukistan.

Scientific, and Cultural Organization (UNESCO), produced millions of dollars in pledges to rebuild and restore structures and provide the human resources needed to maintain them. But participants agreed that an even more important ingredient is political stability.

The proposed restorations do not include rebuilding the famed Bamiyan Buddhas that the Taliban destroyed (*Science*, 9 March 2001, p. 1873). After much discussion, the participants agreed to leave that decision to

the new government. But the plan would stabilize the fractured cliffs that sheltered them, build a new Kabul Museum to replace the one destroyed by war, and rejuvenate the country’s archaeological institutes and its scattered community of researchers. Most Afghan researchers are “dead, wounded, or gone,” notes Robert Knox, Oriental antiquities chief at London’s British Museum, who attended the meeting.

Afghan art and culture are a unique blend of civilizations—Greek, Persian, Indian, and Chinese—that have influenced the region. That rich amalgam has attracted support from European as well as Asian governments, institutes, and foundations. “We received lots of pledges; everyone is strongly motivated,” says Christian Manhart, UNESCO’s Asian cultural heritage division chief. The notable exceptions are the British and U.S. governments, which instead are focusing on military and humanitarian aid.

A Japanese foundation has pledged \$700,000 to begin a project this summer to shore up the Bamiyan cliffs, weakened by the explosives the Taliban used. After surveying the structure, engineers will insert steel cables and concrete. “There is great danger that the niches [surrounding the site] will collapse,” says Paul Bucherer-Dietschi, a Swiss architect who has visited Bamiyan and championed the rebuilding of the statues. There are also tentative plans for a museum and a sound-and-light show at the site.

There were a few happy surprises for the scholars visiting Kabul, including invaluable painted terra cotta statues from Fondukistan that were saved by Afghan archaeologists. But the Kabul Museum, now an empty shell, lost 80% to 90% of its collections. Greece has promised \$750,000 to reconstruct the current building, which is 8 kilometers from the city center. Others argue for a more central location, but the decision will be up to the new government.



Rebuilding a research community will require more than money and political will. The German Archaeological Institute of Berlin has offered \$350,000 to jump-start Kabul’s

own archaeological institute, part of the country’s academy of sciences, and the University of Kabul also has an archaeology department. “Both are completely wrecked” from the prolonged fighting, says Knox. “But the real problem is, who do you train?” A half-dozen

CREDITS: (LEFT TO RIGHT) MARCO DI LAURO/AP; WILLIAM ALLEN/ARKANSAS STATE UNIVERSITY