

Notes & Briefs

Nuclear Fusion, Censoring Science, Hyper-Healthcare, etc.

In January 2003, President Bush announced plans for the U.S. to rejoin an international research consortium that aims to build the world's first nuclear fusion reactor. If it works, the International Thermonuclear Experimental Reactor (ITER) will be the first reactor of its kind capable of producing a nearly unlimited amount of clean, safe, and cheap energy.

With research underway for over a decade now, the ITER has been a joint enterprise of Europe, Canada, Russia, China, Japan, and the U.S., though the United States withdrew support in 1998 due to budgetary concerns. ITER's construction costs have since been reduced from ten to five billion dollars, and last year, the National Energy Task Force,

chaired by Vice President Cheney, asked the Department of Energy to take a second look at nuclear fusion's feasibility and promise.

Unlike today's nuclear fission reactors—which use scarce uranium resources, produce radioactive waste, and cause environmental problems—a fusion reactor could theoretically produce energy from naturally abundant hydrogen isotopes, creating only a nominal amount of radioactive waste that becomes inert in roughly the span of a human life.

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Many of the world's leading scientific journals have adopted a voluntary policy that acknowledges the danger of publishing research that might be of value

to terrorists. Under the new policy, journals will set up processes to determine whether a study could be exploited for the purposes of bioterrorism. Editors will have the prerogative to modify—or even decline to publish—risky papers.

This new self-censorship policy seeks prudently to balance the scientific tradition of openness with the reality of the world's present security situation. The policy has its critics, like the Stanford microbiologist who pointed out to the *New York Times* that some research, proscribed because of its potential value for terrorism, could also be useful for biodefense. "Ignorance is not a good defense," he said. "Knowledge is." Of course, other sensitive areas of scientific research—including branches of physics and mathematics—have long operated under some secrecy restrictions.

The new policy was fleshed out at a January workshop sponsored by the National Academy of Sciences and the Center for Security and International Studies. A statement describing the policy was announced in February at the annual meeting of the American Association for the Advancement of Science. *Science* and *Nature* are among the two dozen participating journals.

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Last January, the Supreme Court upheld a law passed by Congress in 1998 that extended all copyright protections by an additional 20 years, thereby preventing nearly half a million books, movies, poems, songs and other creative material produced between 1923 and 1943 from entering the public domain for two decades. Under the 1998 law, new artistic works don't enter the public domain until the author has been dead for 70 years (or 95 years if the copyright holder is a corporation). The recent Court ruling means,

essentially, that Congress could continue to extend copyright every 20 years *ad infinitum*, even though the Constitution only allows Congress to authorize copyrights for "limited times."

The case, *Eldred v. Ashcroft*, can be seen as just the most recent skirmish in the continuing war over intellectual property in the age of the Internet. This war pits the owners and producers of intellectual property, particularly the music and movie industries, against the "information wants to be free" crowd, led by a motley crew of techno-geeks, libertarians, and librarians. The most famous battles have been over online trading—call it "sharing" or "piracy" depending on whose side you're on—of copyrighted music and movies. In *Eldred*, as in those other cases, we see how the tendency of the Internet to decentralize information conflicts with the desire of corporations to keep a tight grip on their intellectual property.

In the wake of the decision, Lawrence Lessig, the Stanford Law School professor who argued before the Court against the 1998 law, has proposed the "Eldred Act," which would require a copyright holder to pay a nominal fee—perhaps just one dollar—to keep a copyright active after 50 years. His proposal, which Steve Forbes has called a "sensible compromise," is attracting attention.

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The Pentagon's controversial Total Information Awareness (TIA) program is still alive, despite a congressional effort to end it. A project of the Defense Advanced Research Projects Agency, TIA would sift through enormous amounts of information in order to help other government agencies find terrorists before their plans are carried out. Although the project is still in the earliest stages of development, the news of its existence last year

was a media sensation and spawned an enormous public reaction, resulting in congressional efforts to limit the scope of the project and block its funding.

Work on TIA hasn't stopped, although the Pentagon has acknowledged the controversy by setting up two oversight boards to monitor the project: an internal board within the Department of Defense and an outside advisory board that includes such luminaries as Newton Minow, Floyd Abrams, and Lloyd Cutler.

Meanwhile, privacy advocates are gearing up to fight another government data-mining system, the Computer Assisted Passenger Prescreening System II (CAPPS II). This system, created by the Transportation Security Administration, would run quick background checks on all airline passengers before they are allowed to board planes. According to a March press release, the Transportation Security Administration "expects to test CAPPS II this spring and implement it throughout the U.S. commercial air travel system by the summer of 2004."

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Spending on healthcare rose dramatically in 2001, according to a recent report from the Centers for Medicare and Medicaid Services. In that year, Americans spent \$1.424 trillion on healthcare—which breaks down to over \$5,000 per capita. That's a rise of 8.7 percent over 2000, the steepest percentage increase in a decade. The report, published in the January/February issue of the journal *Health Affairs*, also says that healthcare spending grew to 14.1 percent of the GDP in 2001, up from 13.3 percent the year before.

Shannon Brownlee, senior fellow at the New America Foundation, says we're suffering from a surfeit of healthcare in this country. Writing in the January/February

Atlantic Monthly, Brownlee links geography to healthcare spending, making the case that there is "excess spending" on healthcare in some parts of the country. Citing recent studies, Brownlee argues that higher spending on healthcare "does not buy citizens better health"—and in fact can be deleterious, as when a patient is "subjected to diagnostic testing that leads to unnecessary treatment."

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Researchers in Germany, a country still haunted by gruesome memories of Nazi doctors experimenting on Jews (among others), have begun importing embryonic stem cells from Israel for research purposes.

In 1990, the Bundestag passed a law prohibiting research on human embryos and banning their creation in laboratories for any purpose other than in vitro fertilization. In recent years, as interest in embryonic stem cell research has grown, some German policymakers argued that the government should at least allow the importation of embryonic cells from other countries, so Germany could reap the potential medical and economic benefits of such research.

Despite condemnation from a coalition of religious leaders and Greens, the Bundestag voted in 2002 to allow embryonic stem cell importation, but only for use in experiments of "overwhelming significance." In December, a neurobiologist from Bonn received the first permit to import cells derived from destroyed human embryos; the first shipment came from a lab in Haifa, Israel.

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At least two writers so far have described the experience of having their entire genome scanned for mutations. Last November, David Ewing Duncan

wrote in *Wired* magazine about becoming the first healthy human to be fully screened for genetic indicators of possible disease. “All I’ve really learned,” Duncan said, “is I might get heart disease, and I could get diabetes. And I should avoid smoking and unsafe sex—as if I didn’t already know this.”

In February, Nicholas Kristof described his own genome scan in the *New York Times*. He learned that he has “common mutations that give me a mildly increased risk for dangerous blood clots, schizophrenia and Type 2 diabetes. Worst of all, my ApoE gene indicates I have three times the average risk for getting Alzheimer’s.” Nice of them to share!

For the last seventeen years, a tiny federal agency, run jointly by the State Department and the Pentagon, has been quietly encouraging the development of anti-terrorism technologies in the private sector. The Technical Support Working Group provides funding for promising research into devices and techniques that might be useful in preventing or responding to terrorism. They receive applications for funding from companies and individuals, and offer grants to those that seem promising.

The events of September 11 obviously brought added urgency to the group’s work—and significantly more funding. After living with annual budgets under \$10 million for years, the agency’s budget this year could exceed \$200 million. According to the *Wall Street Journal*, the group has received more than 16,000 proposals in the past two years, but only about 120 were funded. Among these are the “dosimeter” (a tiny device that can alert users if they have been exposed to radioactive material), an undershirt that can efficiently cool a person wearing body armor,

and a nearly-invincible laptop computer for use by emergency personnel. The group, acting on behalf of the Department of Homeland Security, now has its eye on devices to screen train passengers, to detect floating mines, and to sample and decontaminate air in office buildings and public places.

Dolly the sheep, the world’s first cloned mammal, was euthanized by her creators on Valentine’s Day, after she was found to be suffering from a severe and untreatable lung infection. Researchers at the Roslin Institute in Edinburgh, Scotland, where Dolly was created and kept, said they hoped to learn through autopsy whether her condition, and the premature arthritis from which she suffered, had anything to do with the fact that she was a clone.

Garry Kasparov, the world’s top-ranked chess player, tied a match against a computer program called “Deep Junior” in February. This was Kasparov’s third highly-publicized match against an advanced chess program; he won the first match (in 1996 against the “Deep Blue” computer) and lost the second (a 1997 rematch against Deep Blue). The tie in this year’s match against Deep Junior was apparently the result of a questionable decision by Kasparov in the final game to offer a draw too quickly.

In a subsequent op-ed in the *Wall Street Journal*, Kasparov characterized these matches as part of a grand experiment in artificial intelligence, and he lauded the operators of Deep Junior for their fairness and openness. He also criticized the IBM team behind his former nemesis Deep Blue, because after Deep Blue’s 1997 victory over Kasparov, they “dismantled the machine

and terminated the experiment” instead of “conducting follow-up experiments” and “spawning dozens of doctoral theses.”

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China’s manned spaceflight plans are part of a larger strategy to step up the country’s production of high-tech weapons systems, according to the Russian Ministry of Defense. As translated and reported in the American Foreign Policy Council’s “China Reform Monitor,” the Russians believe that China’s “main emphasis of military production is on breakthrough technologies in rocketry and space, aviation, naval, and laser equipment, air-defense systems, and command, control, and communications.”

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DriveSavers, a California company that specializes in data recovery, employs a full-time crisis counselor to console and comfort customers distressed by the prospect of losing their hard drives, according to the *San Francisco Chronicle*. The counselor apparently spent years working at a suicide hotline before coming to DriveSavers—and the new job seems to her pretty similar. As she put it: “A crisis is a crisis is a crisis.”

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Based on DNA evidence collected in countries that were once part of the Mongol empire, a team of researchers has concluded that about one out of every 200 men alive today is descended from Genghis Khan. By using genetic clues on the Y-chromosome, which only men have,

the researchers determined that a single man who lived in the last millennium is probably the direct male ancestor of 16 million men alive today. In their paper, called “The Genetic Legacy of the Mongols” (*American Journal of Human Genetics*), the researchers concluded that only Genghis Khan fit the bill. By way of comparison, an ordinary male contemporary of Genghis Khan would likely have about 20 descendants in his direct male line alive today.

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Agnes Scott College, a women’s school just outside Atlanta, opened its new science center earlier this year. Gracing the east wall of the building’s atrium is a three-story double helix, along with more than a thousand letters representing a nucleotide sequence from the mitochondrial DNA of the woman for whom the college was named. Although Agnes Scott died in 1877 and no samples of her DNA were available, the school found a writer living in Pennsylvania who, because she is a direct female descendant of Agnes Scott, has the same mitochondrial DNA. The descendant was also an alumna of the school, and she agreed to donate samples of her blood for the project.

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Last December, the federal government launched a new website to bring together science-related resources from about a dozen government agencies. The site is Science.gov, a one-stop-shopping portal modeled after the FirstGov site.