vides access to dozens of chemistry journals, while HighWire Press of Stanford University Press in California has created a site with some 130 crosslinked online journals, including *Science* Online. Commercial giant Elsevier Science also has backed several sites, including BioMedNet and ChemWeb, stocked with dozens of its titles.

But many aggregators continue to hunt for the right combination of pricing, advertising, and access policies. And some predict BioONE may have trouble satisfying everyone. Librarians, for instance, may be loath to sign up for the whole collection when they now have the freedom to select individual journals. "It should be a very interesting experiment—they will be wrestling with the same economic issues we do," says Don Muccino, executive vice president of the Online Computer Library Center in Dublin, Ohio, a library-backed nonprofit aggregator that puts more than 1600 journals online.

BioONE backers, however, are confident they can devise a workable solution that others may want to emulate. Says the University of Kansas's Beth Forrest Warner: "We're real excited about the possibility of breaking some new ground here." **–DAVID MALAKOFF**

SCIENCE IN SOCIETY

Panel Discounts Implant Disease Risk

A blue-ribbon panel has concluded that silicone breast implants do not increase the risk of diseases such as lupus or cancer, rejecting a theory invoked in countless claims against implant manufacturers. But the report, released earlier this week, is unlikely to be the last chapter in the lawsuit-weary saga: The Institute of Medicine (IOM) panel cites evidence that silicone implants can leak and cause infections or painful scarring around the implants.

Anecdotal reports blaming implants for serious health problems first arose in the late 1980s and led to billions of dollars worth of legal claims against manufacturers. Most of those claims are now being resolved, as Dow Corning, Bristol-Myers Squibb, and other manufacturers have agreed to create settlement funds totaling about $7.2 billion. In the meantime, studies on implants and chronic disease risk have been coming up empty-handed. The IOM panel "is simply saying over again what we already knew—that the case for autoimmune disease was extremely weak," says Yale University immunobiologist Charles Janeway. But he and others say the imprimatur of the nation's top medical advisory body gives that conclusion more weight, shifting the scientific focus and legal battleground from systemic disease to local problems caused by ruptured implants.

The IOM stepped into the thorny arena of implant science in late 1997, at the request of the Department of Health and Human Services. The 13 panelists, led by Stuart Bondurant, a professor of medicine at the University of North Carolina, Chapel Hill, examined some 2000 peer-reviewed studies and 1200 other data sets and reports, searching for links between implants and lupus, rheumatoid arthritis or other connective tissue diseases, cancer, or neurological diseases. The committee also heard testimony from sick women and was "moved by their suffering," it said.

But the touching personal stories failed to sway the panel's views on the data. It concluded that the 1.5 million to 1.8 million U.S. women with implants are no more susceptible to serious diseases than are women without implants, according to available evidence. This conclusion, the panelists noted, is consistent with reports in the past year from U.K. experts and a panel appointed by a U.S. judge overseeing breast cancer litigation (*Science*, 11 December 1998, p. 1963).

But the panel did not give implants a clean bill of health. Essentially plastic bags filled with silicone gel, implants can rupture in an unknown percentage of women—studies have cited rates as low as 0.3% or as high as 77%. The pain of breast tissue contracting around implants, as well as infections and other health risks from surgery to replace implants, are "the primary safety issue[s] with silicone breast implants," the report found. The panel recommends more research to track women with implants to get a better handle on problems such as rupturing and second surgeries, and improved tests to gauge silicone concentrations in body fluids and tissues.

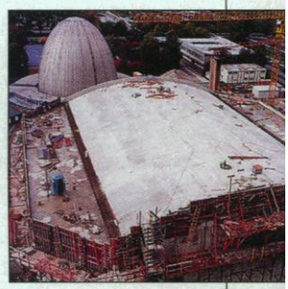
> **The IOM panel "is simply saying over again what we already knew."**
>
> **—Charles Janeway**

Some observers who are not ready to dismiss the disease threat say they are waiting for the results of a major epidemiological study on women with implants by the National Cancer Institute (NCI), due out later this year. That study, however, may be predetermined to find problems, says IOM president Kenneth Shine: Materials for recruiting participants may have "encouraged women with symptoms and problems to enroll," he says, rather than gathering a sample that would include healthy women with implants

CREDIT: TECHNICAL UNIVERSITY OF MUNICH

ScienceScope

Enriching Debate An expert panel has presented the German government with some choices for a controversial new reactor near Munich that's designed to produce neutrons for materials science and other research. The $500 million FRM-II neutron source, due to be completed in 2001, would be fueled by highly enriched uranium, which can be used to make weapons. Nonproliferation advocates want the reactor to be reconfigured to use a low-enriched uranium fuel. The German government appointed a committee in January to review alternatives (*Science*, 5 February, p. 785).



This week, the seven-member panel concluded that it would be costly and time-consuming to alter FRM-II's design this late in the game. But the panel, led by science ministry official Wolf-Michael Catenhusen, said that the reactor might be able to make a less costly switch by 2008 to a low-enriched uranium fuel in development.

The German cabinet is expected to decide how to proceed within a few months. But any changes in the FRM-II must be coordinated with the state of Bavaria, which oversees the project.

Biology Boost An alumnus who made a fortune selling car insurance has pledged $35 million to a new genome research center at Princeton University. The gift from Peter Lewis, CEO of Progressive Corp. in Cleveland, Ohio, will cover almost half the planned $75 million budget of the Institute for Integrative Genomics.

The donation marks the latest gain for genome studies at major research universities. Harvard recently decided to spend $40 million on a center to apply genomics to the study of evolution, while the California Institute of Technology is more than halfway toward a goal of raising $100 million for interdisciplinary research on the brain and development. The Princeton center, launched last year, is probing how a cell's many molecular components fit together as a functional unit of life, says cell biologist Shirley Tilghman, the institute's director.

"This is a trend you are going to see more of," says Bruce Umminger, division director of integrative biology and neuroscience at the National Science Foundation.

Other researchers are impressed, saying the technique could capture cells and tissues in three dimensions and give depth to machine vision. Kelvin Wagner, an electrical engineer at the University of Colorado, Boulder, who is familiar with the work, calls the group's method "an amazingly elegant way of turning the problem from something very messy into something far simpler."

3D dino. A (2D) rendering of the 7-centimeter dinosaur used to test the imaging system.

The technique grew out of a mathematical insight that joined two traditionally separate imaging tools. One, widely practiced in radio astronomy, is interferometry, in which radio waves collected by separate dishes from the same point in the sky are allowed to interfere. The waves' interference can be translated into the position and intensity of their source, and combining interference data from many different points yields precise 2D maps of quasars, supernovae, or galaxies. The other mathematical tool is tomography—the T in x-ray CT scans, which pinpoint the body's internal structures by analyzing x-rays sent through the body along many different paths.

The mathematical match was made when Daniel Marks, an Illinois graduate student, noticed that applying a mathematical tool called a Fourier transform to interference measurements would yield a data set ready-made for a particular type of tomographic analysis. By dovetailing the tomographic and interferometric algorithms and applying both of them to visible light, the group came up with its 3D lensless camera.

The imaging begins as the object—in this case a small plastic dinosaur—is rotated in front of an interferometer. For each viewing angle, the interferometer collects light that follows many different paths from each point on the object, filters it, and allows it all to interfere. The result is a pattern of light and dark spots, captured by an array of detectors. Then the algorithms kick in. First comes the analysis of the interference data, which transforms it into a two-dimensional projection—something like a shadow of the object. Next is the tomographic algorithm. It analyzes the two-dimensional projections, each one analogous to the x-rays collected along a single viewing direction in CT scanning, to build up a set of image slices representing the three-dimensional object.

The tomographic algorithm was designed for x-rays, which pass virtually unhindered through most tissues, but the Urbana-Champaign team has found that it also works surprisingly well for light reflected from opaque objects, allowing them to map the surface of their dinosaur with a resolution better than 1 millimeter. And the result is far richer than a hologram, which is made by recording the interference patterns of laser light, says David Brady, an electrical engineer with the Illinois group. Holography, which generally does not scan all viewing angles, "is not really a 3D imaging technique; it's a 3D perspective preserver," explains Brady.

Thomas Cathey, an electrical engineer and colleague of Wagner's at Boulder, cautions that the technique may be too slow for use in real-time applications such as robotic vision or automated quality control in manufacturing. But George Barbastathis, an electrical engineer at the Massachusetts Institute of Technology, thinks that for imaging biological samples, the new system could ultimately surpass techniques such as confocal microscopy, which builds up 3D images by illuminating and imaging samples point by point.

"Confocal systems acquire intensity data one point at a time," notes Barbastathis. "With Brady's method you scan in parallel. If they can manage to make the resolution comparable to confocal microscopy—and I believe that with their method it's actually possible to make the resolution better—then in that case it wins hands down." **–DANIEL RADOV**

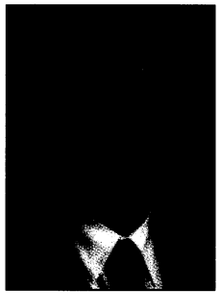
Daniel Radov is a free-lance writer in Brookline, Massachusetts.

CREDIT: (TOP TO BOTTOM) MARKS *ET AL.*; CATHALEEN CURTISS; CARL COX

BIOPATENTS

Legal Fight Over Patents on Life

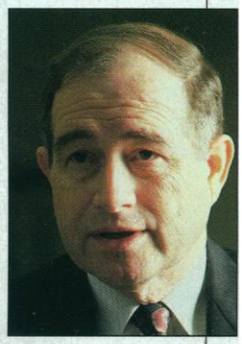
Biologist Stuart Newman of the New York Medical College in Valhalla is trying to get a patent on a "humanzee"—a chimeric animal made from human and chimpanzee embryos. Not because he really wants to create one, but because he wants to prevent other people from making one, and to challenge the rules for patenting life. Together with Jeremy Rifkin, president of the Founda-



Provoking a debate. Jeremy Rifkin.

ScienceScope

Change of Heart When it comes to evaluating the effectiveness of federal R&D programs, you can't have too much input. At least that's what Neal Lane (below), the president's science adviser, has decided in lifting his objections to a congressional suggestion that the National Academy of Sciences (NAS) examine how well federal science agencies are complying with a 1993 law that calls for annual reviews of their research portfolios.



Last fall Lane complained to legislators that an NAS study, recommended in a bill funding the National Science Foundation, would be redundant and out of step with the Government Performance and Results Act. But now he has given NAS president Bruce Alberts the green light for such an "independent assessment," suggesting in a letter that the academy write up case studies of a half-dozen federal programs. The House and Senate science panels have chimed in too, stating in separate letters that they "look forward to seeing the results."

Academy staffers hope that the support from Lane and Congress will persuade agencies to pony up the needed $300,000 for the study. If funded, they say, the project would take about a year.

Sounding Out The U.S. Office of Naval Research (ONR) wants to continue the once-controversial Acoustic Thermometry of Ocean Climate (ATOC) project, which measures sea temperatures by clocking underwater sound pulses.

In 1994, activists stalled the installation of ATOC emitters off California and Hawaii, worrying that the pulses would deafen whales; that fear proved unfounded (*Science*, 27 February 1998, p. 1302). But ATOC's $40 million seed grant ran out last year and the California station is being dismantled. Last week, however, ONR signaled its desire to keep the Hawaii source running for at least a few more years, saying it will sponsor an environmental study necessary for obtaining new operating permits. ATOC researchers are thrilled by the move, which could take a year to complete, because it will allow them to collect valuable long-term data.

Contributors: Robert Koenig, Elizabeth Pennisi, Jeffrey Mervis, David Malakoff