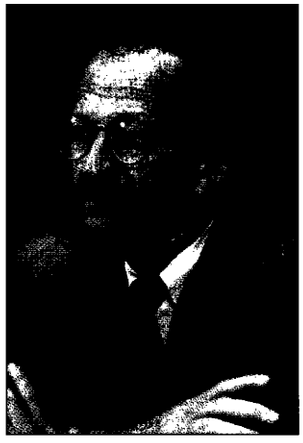
SCIENTIFIC PUBLISHING

Varmus Circulates Proposal for NIH-Backed Online Venture

Low-cost biomedical publishing on the Internet could explode soon, if a plan drafted by the National Institutes of Health (NIH) takes off. Last week, NIH director Harold Varmus and colleagues circulated a proposal that could greatly expand the use of the Internet to distribute original biomedical papers. Although the community has made only "sparing use" of electronic media so far, Varmus and his colleagues write, they anticipate that NIH will launch an online publication service "in the near future." But the community may not be ready for a radical change: The first reaction of a prestigious editorial group at the National Academy of Sciences—briefed on these ideas on 25 April—was less than enthusiastic.



Gazing into the future. Varmus sees an online world.

The proposal, dated 22 April and distributed by e-mail, is the first detailed presentation of ideas outlined by Varmus at a congressional hearing last month (*Science*, 12 March, p. 1610). The draft, written by Varmus "with active assistance" from David Lipman, director of the National Center for Biotechnology Information, and Pat Brown, a geneticist at Stanford University in Palo Alto, asks for "constructive comments from the scientific community." Later, the authors will revise the proposal and publish it in a print journal.

The authors call the proposed venture "E-biomed." It would "in no sense" be ruled by NIH, they claim, but would be financed and maintained by NIH. They suggest that an independent board of governors would make and enforce rules. Its members—representing "readers and authors, editors, computer specialists, and funding agencies"—would set policies, select reviewers, and ensure fair access to the site. The authors do not say much about the board's composition or authority, but they assume that the members would be "assembled" by NIH. And they also offer a plum to prospective authors: E-biomed, unlike existing journals, would allow them to retain copyright claims.

According to this scheme, scientists could approach E-biomed on several tracks. Those choosing the high-prestige route would submit papers to a network of peer reviewers—possibly the same reviewers now used by scientific societies and journals. This route would be "closely aligned with current practice," Varmus writes—selective and ponderous. If rejected, an author might submit the paper to another group or seek publication through a less prestigious reviewed area of the Web site. But authors would also have a simple alternative: a route to publication requiring virtually no review and no editing.

This track would require only that an author obtain prior "validation" of an article from two members of a large panel of scientists. This screening panel of "several thousands," according to the Varmus memo, would be vetted by the governing board. The validation process, the article says, should exclude "extraneous or outrageous material" but remain flexible enough "to permit rapid posting of virtually any legitimate work." Although scientists might hesitate to use this shortcut at first, Varmus observes, they would probably warm to it. It would offer "simplicity, flexibility, and speed," he says, as well as access to a broad audience.

Varmus and his colleagues say that E-biomed could "maximize the dissemination" of new data, delivering information to more readers more rapidly than print journals. They praise the convenience of electronic search engines, which enable readers to mine old papers while keeping up with new ones. In addition, they say E-biomed would handle more complex data displays. They're enthusiastic about the low cost of electronic delivery, the ease of researching hyperlinked footnotes, and the potential for quick feedback from readers.

Despite such promises, however, E-biomed is already taking some criticism. For example, Martin Frank, the outspoken executive director of the American Physiological Society, sees it as superfluous: "Most nonprofit publishers are already working to implement Varmus's vision of a Web-based journal with online submission and review." Frank asks: "Does the federal government really need to insert itself into the scientific publishing arena?" He doesn't think so. David Botstein, chair of genetics at Stanford, gives a mixed review: He likes the concept, but not all the ambitious details of the E-biomed proposal. "The direction is correctly futuristic," Botstein says, "but if it were up to me, I would start with more modest measures."

Nicholas Cozzarelli, editor of the *Proceedings of the National Academy of Sciences*, also reported a mixed review after Brown briefed his editorial board last week. *PNAS*'s leaders were in agreement, Cozzarelli says, that NIH should go ahead with the second part of the current proposal: an experimental preprint server to share unpublished data. This will be a "huge undertaking," Cozzarelli says, and "very good for science." But beyond that step, the *PNAS* group felt that the proposal became complex and that NIH should proceed with caution—or perhaps not at all. **–ELIOT MARSHALL**

BIOTERRORISM

President Revokes Plan To Destroy Smallpox

Since the mid-1990s, the U.S. government has supported an international plan to eradicate every last trace of variola virus, the cause of smallpox. Vaccination all but eliminated this ancient and deadly disease in the 1970s, and no new cases have been reported since 1978. Health officials hoped that it would be the first human pathogen purged from planet Earth: More than 70 nations had tentatively supported a plan to destroy all known stocks of the virus in June 1999. But the U.S. government changed its mind last week. Joining Russia, which has argued that live samples of the virus should be kept for research, President Clinton signed a memo calling for preservation of variola in

CREDIT: RICK KOZAK

high-security labs.

According to a White House security official (no announcement was published), the Administration decided after an internal review that live virus should be preserved for use in developing new antiviral drugs and testing improved smallpox vaccines. The aim would be to guard against clandestine development of smallpox weapons by terrorists or hostile states. "We live in a time when bioterrorism is a real concern," says a senior Administration official who spoke on background. And the current smallpox vaccine stockpile, he says, is "grossly inadequate," because it relies on a live virus vaccine that cannot be given to immunocompromised persons.

Anachronism? Doctor extracting vaccinia virus to vaccinate patient. Current smallpox vaccines are still based on vaccinia.

The policy change brings an end to a long-running debate in the U.S. government between advocates and opponents of total eradication of the virus. It represents a victory for defense agencies, which had argued that it would be rash to throw away this potentially valuable research tool, and a defeat for some health leaders who felt the world would be safer if all known variola stocks were destroyed. Only Russia and the United States are currently known to possess cultures of variola, although individual experts have been saying for some time that they suspect that not all variola stocks have been accounted for.

The U.S. debate reflects a split within the World Health Organization (WHO) in Geneva. Advocates of total eradication such as public health researcher D. A. Henderson of The Johns Hopkins University in Baltimore have argued in WHO meetings since the early 1990s that smallpox is such a horrific disease that its source should be obliterated—totally and permanently. Henderson has suggested that the live virus is so infective and lethal—with a mortality rate of around 30%—that it shouldn't even be kept in secure labs. Henderson also has argued that there is little value in preserving the virus. He points out, for example, that it cannot be studied in animals, as it doesn't infect them. And it is so dangerous that few scientists would want to handle it, even in the safest environment.

Such arguments persuaded WHO to do away with variola. WHO members agreed first to send all research stocks of the virus to two repositories, one in Russia and the other in the United States. Then an executive committee voted that these stocks would be destroyed in June 1999, if the WHO general assembly gave the final go-ahead in May. Although most members may still support the plan, the two that control the variola stocks do not.

Resistance to the WHO plan has developed slowly. Russia opposed it from the outset. But the British and U.S. defense establishments disagreed more quietly. Recently, one U.S. official—Alan Zelicoff, a biodefense expert at the Sandia National Laboratory in Albuquerque, New Mexico—has gone public with strong objections to the WHO plan. Zelicoff, who debated Henderson on the smallpox decision last month on National Public Radio, contends that the policy of total eradication had White House support for several years because one National Security Council staffer advocated it. But recently, he says, other national security experts intervened and prompted a policy review.

At the same time, according to Zelicoff, Joshua Lederberg, president emeritus of The Rockefeller University in New York City, who is concerned about bioterror risks, was "influential" in getting federal agencies to fund an external review by the Institute of Medicine (IOM). The IOM report, issued in March, didn't take sides in the debate, but concluded that scientists might use live variola productively to develop new antiviral drugs and vaccines (*Science*, 19 March, p. 1825). The IOM report was crucial, a Clinton Administration official says, to the change in U.S. policy.

The plan now goes to the WHO general assembly for a vote. But because the two countries that hold the stocks now oppose destruction, the issue may be moot.

–ELIOT MARSHALL

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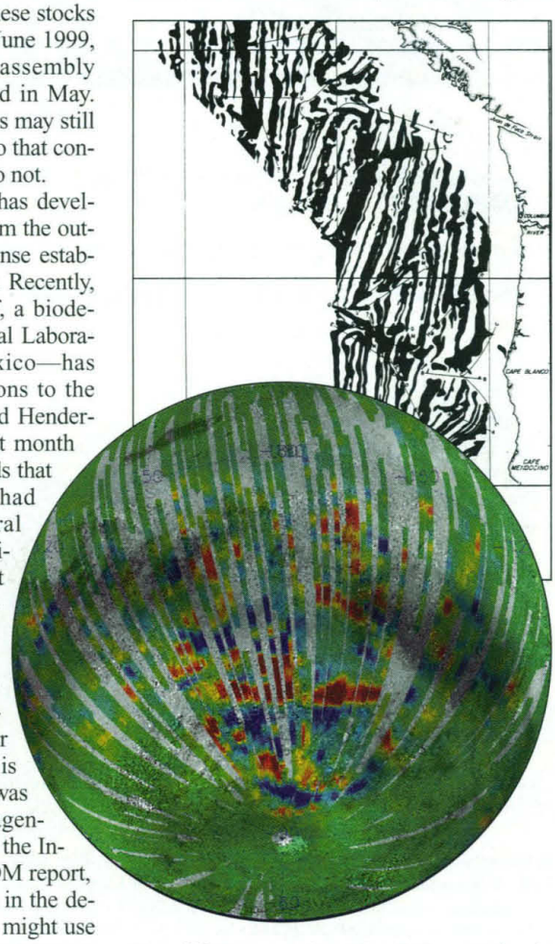
PLANETOLOGY

Signs of Plate Tectonics On an Infant Mars

Almost 40 years ago, geophysicists made history by realizing that Earth's surface is shaped by plate tectonics—that new crust is born in midocean ridges and plates move around the globe. Pivotal to the discovery were rank upon rank of magnetic stripes that march across the sea floor, each marking the



How did Mars earn its stripes? Magnetic banding on Mars (orange and blue) may be the mark of plate tectonics, as it is on Earth *(top)*.