more cost-effective than penetrating bombers in providing a retaliatory capability. Among the strongest advocates of that position at the time was William Perry. Perry is now one of the leading promoters of the B-2, however.

"It's a mistake to think of stealth as just this airplane," says Perry, who is now chairman of H&Q Technology Partners in Menlo Park. He argues that stealth technologies will "revolutionize" many weapons systems, providing a capability not only to evade warning radars but also to elude radar-guided missiles. The B-2 is "the leading edge of stealth technology. It is important to maintaining our leadership in this field," he says.

Already, stealth technology has been extensively used in the F-117A, a supersecret fighter plane that has been operational since 1981. Last month, the Pentagon released a fuzzy picture of the aircraft, the first official admission that the fighter even exists. The technology is also being applied in the advanced cruise missile, an air-launched missile that is expected to provide even more capability in penetrating Soviet defenses than the already near-invisible standard cruise missiles. Helicopters and even some surface ships are expected to use some stealth technologies in the future.

But all these wonder weapons will carry a high price tag, and that, if anything, could be the B-2's downfall. At $70 billion, the aircraft will certainly be highly visible to Congress's budgetary antennas. Senator Sam Nunn (D–GA), the chairman of the Senate Armed Services Committee and a strong supporter of the B-2, warned recently in a television interview that the program at best would have to be stretched out because of the impending squeeze in the military budget.

Representative Les Aspin (D–WI), chairman of the House Armed Services Committee, recently estimated that, under current plans, strategic bombers are expected to cost $245 billion to buy and maintain between 1981 and 2004, in part because they are expensive to operate. That would be 57% of total spending on strategic weapons systems, including the entire land-based and sea-based nuclear arsenals. Drell of Stanford says, "I don't consider having bombers destabilizing. They are slow fliers and don't pose the same kind of destabilizing element as a prompt counterforce capability." But, he says, "we are committed to a construction program we cannot afford. The question is, what gives?"

Whether it is the B-2 that gives may depend in part on the fate of the troubled B-1. The B-1 has encountered serious technical difficulties, and the Congressional Budget Office recently estimated that it could cost as much as $8 billion to fix the problems and enhance the plane's ability to penetrate Soviet airspace. Whether Congress will be willing to come up with the funds for the B-1 will at least affect the perceived need and timing of its successor.

One well-placed congressional aide says that, so far, political support for the B-2 remains strong, and at this point, "I frankly don't see the B-2 program being killed." However, he notes that over the past few years, public attention has been fixed on only one major defense program at a time. First it was the MX, then the B-1, then the Strategic Defense Initiative. If only because of its cost, the B-2 could be next, he predicts. ■ COLIN NORMAN

Patent Backlog: Solution Pending

The Office of Patents and Trademarks is moving to relieve the backlog of unprocessed patent applications involving inventions based on the use of recombinant DNA and other bioengineering techniques. The agency has added dozens of patent examiners and it claims to be compressing the average processing time for biotechnology patents. The pile of pending applications continues to grow, however, and officials say it could be several years before significant reductions in the backlog are achieved.

Patent examiners in recent years have found themselves falling further and further behind in processing patent applications. Many applications were taking well over 2 years to process. The number of new patent claims has mushroomed as the use of recombinant DNA techniques in medicine, agriculture, and industrial processes has yielded an expanding number of discoveries.

The patent office received 6850 new applications for biotechnology-related patents in fiscal year 1988, an 11% increase over the previous 12-month period. John Kittle, who heads the biotechnology review section, says applications are being handled more quickly this year.

The ability of the patent office to deal with the growing work load has been hampered to an extent by a fragmented organizational structure that had a number of different sections examining biotechnology claims. More troublesome, however, has been understaffing in the biotechnology patent groups and high employee turnover (*Science*, 12 February, p. 723). These latter two problems are the result of "bad judgment on the part of budgeters within the outgoing administration," says Richard Godown, president of the Industrial Biotechnology Association (IBA).

In the wake of industry protests, the agency in April consolidated its biotechnology patent examining groups into a single entity known as section 180. Thirty examiners have been added to the group since then, bringing their total to 97. The new recruits include veteran examiners with scientific training and new hires with doctorates in microbiology and related disciplines. Another 20 examiners will be hired this year. In addition, patent office commissioner Donald J. Quigg plans to have American biotechnology companies play a larger role in schooling patent examiners in new scientific and technological developments in the industry.

This move is an outgrowth of a list of suggestions that Godown sent to Quigg in April. The agency is recasting its current training efforts to create a biotechnology institute to help train new patent examiners and to keep veteran examiners abreast of the latest scientific developments and patent law issues. The institute concept is not very different from the patent office's traditional training program. But it will provide more intense education for examiners involved in the complex world of biotechnology patents.

The institute's curriculum will be shaped by the agency with the advice of a board composed of industry trade groups, bar associations, and scientific societies. These programs will augment the agency's existing activities, which include lectures at local universities, tuition refund programs, and site visits to industry laboratories. IBA has indicated that its members are willing to increase their contributions to the agency's existing examiners' training fund to support these functions as well as to finance the purchase of some extra copies of scientific journals that examiners require.

Despite all these steps, patent attorneys and trade association executives are not expecting the processing of biotechnology patents to improve dramatically overnight. New examiners must be schooled in patent law and have several years experience before they really become productive, notes Iver Cooper, a patent attorney in Washington, D.C. Moreover, if salaries and working conditions do not improve significantly, adds Bertram Rowland, a patent attorney with Leydig, Voit & Mayer of Palo Alto, California, the agency will continue to lose large numbers of examiners to private law firms or biotechnology companies that can pay them far more than the government does now. ■ MARK CRAWFORD