

► **Seeking the Senate's Critical Mass** In a speech before the United Nations General Assembly on 22 September, President Clinton said he had sent the Comprehensive Test Ban Treaty to the Senate that day for ratification—a year after he became the first of 146 world leaders to sign it (PHYSICS TODAY, December 1996, page 37). But Senate action on what Clinton called “the longest-sought, hardest-fought prize in the history of arms control” is unlikely before next year, and even then some members of Congress are certain to raise objections to the CTBT. Ratification requires two-thirds of the Senate to vote for the treaty.

Foreign Relations Committee Chairman Jesse Helms, a North Carolina Republican, was recently characterized by one of his aides as “agnostic to against” the treaty. Helms himself has said, “I recommend that you do not hold your breath” for the CTBT.

The centerpiece of the Senate debate is certain to be the issue of whether verification is reliable enough to ensure that no nation is developing nuclear weapons. A National Research Council panel issued a report in July describing the science and technology needed to monitor the nuclear test ban. It identified four scientific subjects—namely, seismology, hydroacoustics, infrasound and detection of radionuclides in the atmosphere. The treaty contains provisions for an extensive monitoring network consisting of 170 seismic, 11 hydroacoustic, 60 infrasound and 80 radionuclide stations distributed around the world. Even so, it will be difficult to convince enough senators that nuclear arms cannot be obtained by hook or by crook.

► **Demise of the Killer Laser** On 4 October, the 40th anniversary of the launching of Sputnik by the Soviet Union, the US Army was to mark the occasion by zapping a working satellite with a laser left over from the Strategic Defense Initiative (SDI). But cloudy weather and faulty software prevented the laser, known as MIRACL (for Mid-Infrared Advanced Chemical Laser) from hurling a powerful six-foot-wide beam at an Air Force missile-tracking satellite in orbit some 260 miles above Earth. When another attempt was blocked by cloud cover two days later at the White Sands Missile Range in New Mexico, Pentagon officials said it is unlikely the test will be conducted at all.

Ignoring calls from arms control advocates to cancel the test, the Pentagon claimed the experiment's aim was to measure the extent to which enemy lasers on the ground could blind or destroy US satellites in orbit. Critics of the test worried that any demonstration of US laser capability in space might encourage other nations to develop antisatellite weapons. “It's quite an anticlimax, to say the least,” said Steven Aftergood of the Federation of American Scientists, which opposed the test.

Technical considerations rule against the test. For one, the satellite must be directly overhead. After 6 October the spacecraft was in the wrong orbital position for a hit by the laser. Moreover, the satellite is losing the power it would need to transmit data on the experiment. And it is entering a period when it will spend more time in Earth's shadow and therefore won't be able to collect solar energy to recharge its batteries.

Spurgeon Keeny, executive director of the Arms Control Association in Washington, said that “if technical troubles or bad weather have prevented the experiment from taking place, we're all better off.” There was little need for the test, a former SDI official observed. “MIRACL punched a hole in a Delta rocket in a test in 1986,” he said. “So we knew its potential then.”

► **Travails of Stockpile Stewardship** The cost of maintaining the nation's nuclear weapons stockpile is going up—by \$100 million in fiscal 1998 and possibly \$500 million in 1999, according to Robert Bell, a senior director of the National Security Council, who briefed reporters following President Clinton's speech on 22 September at the United Nations.

Just a year ago, officials of the Department of Energy's science-based stockpile stewardship program insisted that an annual expenditure of \$4 billion would suffice for the next ten years. But in the past few months, heads of the weapons labs have said they need more funds, partly because of the drain created by the \$1.2 billion National Ignition Facility (NIF), the mammoth center with a 92-beam laser that is being built at Lawrence Livermore National Laboratory for evaluating nuclear weapons, and by the advanced supercomputing program and other facilities for maintaining the readiness and reliability of nuclear arms.

A few weeks earlier, the Livermore project faced a new legal challenge. It came from the same 39 environmental and disarmament groups that had previously failed to convince the US District Court in the District of Columbia to issue a preliminary injunction to halt the facility (PHYSICS TODAY, October, page 87). In the second action, the plaintiffs, led by the Natural Resources Defense Council, petitioned Judge Stanley Sporkin, who had ruled in the prior action, to prevent NIF's construction on the grounds that the facility would be located atop a hazardous waste dump. Crews excavating the site in early September uncovered 112 large high-voltage capacitors containing PCBs, as well as 75 crushed and corroded steel drums, which were lying under a sign saying radiation danger. The capacitors were quickly removed and shipped to a dump site in Utah. Though the drums were found to have no traces of radioactivity, they were sent to Utah anyway. At a court hearing on 26 September, Sporkin refused to restrain DOE from proceeding with NIF and ordered both sides to negotiate a settlement. Though the excavation for NIF is now completed, the lawsuit may drag on, because the court has yet to rule on the adequacy of DOE's environmental impact report for the whole stockpile stewardship program.

► **Engineering Laureate** At its annual meeting on 7 October, the National Academy of Engineering announced that the Draper Prize, engineering's highest honor would be awarded to Vladimir Haensel, a professor of chemical engineering at the University of Massachusetts in Amherst. This year, the prize carries an honorarium of \$450 000, its highest ever.

Haensel was selected by a 13-member panel for his invention of “platforming”—a chemical engineering process using a platinum-based catalyst in converting petroleum into high-performance fuels and in generating aromatic hydrocarbons for manufacturing plastics. The word platforming is short for platinum reforming, which Haensel conceived in the 1940s while working for Universal Oil Products in Des Plaines, Illinois.

► **R&D Tax Credit Redux** Among the unheralded features in the Taxpayer Relief Act of 1997—better known for reducing the maximum tax rate on capital gains from 28% to 20% for assets held longer than 18 months—is the R&D tax credit. After the credit ran out at the end of May, business executives bombarded members of Congress to renew it (PHYSICS TODAY, July, page 49). In its first version of the tax bill, the Senate proposed a 31-month extension of the R&D credit. Some in the House argued for letting it lapse because the write-off seemed to them little more than “corporate welfare.” As always in politics, compromises had to be made, and the final bill, signed by President Clinton on 5 August, includes a 13-month extension, retroactive to last May and allowing the credit to run to 30 June 1998. “We can't quibble about the period,” says William T. Archev, president and CEO of the American Electronics Association. “But it's a bitter-sweet victory, and we'll be back on the battlefield next year.” Meanwhile, the expected savings for industry is likely to amount to \$2.3 billion.

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