pressures in today's academic climate, "it's not surprising that teaching undergraduates is not seen as the best path to achievement and success," Goldsmith says. And the NRC panel adds that secondary school teachers should spend at least a semester doing original research under an academic scientist—if not as part of their undergraduate education, then in midcareer training.

The NRC also calls for an overhaul of the textbook publishing system, demanding that authors take back control of content from the publishers. It further suggests that the academic community institute comprehensive reviews of high school textbooks.

Inspired by late Yale president A. Bartlett Giamatti, who emphasized "asserting a vision" and making it "practicable and compelling" as the foundation of educational leadership, the panel also recommended setting up a permanent board at the NRC as a bully pulpit for promoting reform efforts.

Despite the strong tone in much of the report, it does occasionally falter. In considering how high school science teachers are certified, for instance, the report suggests only that alternative certification programs—in which individuals without degrees in education can be certified to teach—should be "critically evaluated." Why didn't the panel provide such a critical evaluation itself? Goldsmith says it would have led the committee "beyond the scope of our study" by raising the issue of how to judge teacher effectiveness.

Federal Scientists' Unwanted Vacations

Scientists employed by the federal government could soon get free—read, "unpaid"—vacations, courtesy of President Bush and the Congress. The reason? To reach Gramm-Rudman-Hollings deficit reduction targets, federal agencies are looking for ways to slash domestic spending by nearly a third, and one way to do that is to reduce the workforce, at least temporarily.

The current budget mess has arisen because the White House and Congress have been unable to agree on a package of spending cuts and new taxes that will bring down the deficit from an estimated $168 billion to $64 billion. Until they do, federal agencies have to assume the worst—hence the furlough notices.

At the National Institutes of Health, virtually all employees—including intramural research scientists—received a letter at the end of August from the personnel office warning them they may be furloughed for as many as 22 workdays. Similar letters went out at most other scientific agencies, including NASA and the National Oceanic and Atmospheric Administration.

One notable exception is the National Science Foundation, where enough budget flexibility exists so that officials can juggle grant funding rather than lay off employees. But this juggling act can last only a few weeks, so if the agency must cut its budget severely, NSF employees will probably also get some unexpected and unwanted free time. NIH, too, could juggle its extramural spending to avoid laying off intramural scientists, but officials there have said they want to spread the cuts across all aspects of NIH's budget in the interest of fairness.

Ironically, the National Research Council chose last week to issue a new report entitled "Recruitment, Retention and Utilization of Federal Scientists and Engineers." Considering that the report cites numerous problems with federal personnel practices, its timing couldn't have been more appropriate. Right now, Washington is full of federally employed scientists who'd be glad to give you an earful on that topic.

More Delays for Shuttle Space Science

NASA managers announced last week that technical problems could delay two important space science missions.

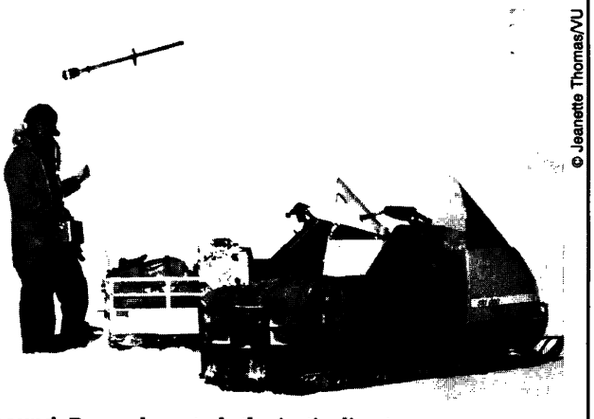
Astro-1, a package of astronomical instruments that was originally planned to fly on the shuttle last May (*Science*, 22 June, p. 1486), was delayed when the orbiter *Columbia* developed another hydrogen fuel leak similar to those which have kept NASA's shuttle fleet grounded all summer. Engineers are hoping to replace a fuel circulation pump and have the shuttle ready for launch the week of 17 September. But any snags could bump Astro-1 until November—or later—so the Ulysses solar mission doesn't miss its narrow launch window in early October.

That's assuming, of course, that the shuttle scheduled to loft Ulysses is ready to launch on time. NASA administrator Richard Truly told reporters that *Discovery* is leaking freon coolant at the rate of about 1% a day. Engineers may be able to work around the problem, but the possibility remains that they'll need to replace an ammonia boiler at the site of the leak—repairs that might push *Discovery* to the very edge of its launch window on 23 October, Ulysses' last chance for launch within the next 13 months.

At least Astro-1's observation mission isn't jeopardized by delay. The Astro-1 team has already drawn up a completely new observing schedule because of the summer delay; if the launch slips back to October, they'll just do the same again.

Arctic Science Gets Organized

Scientists interested in Antarctica have long benefited from extensive international cooperation, thanks to a 1959 treaty governing that continent. Up at the top of the world, however, they haven't been so lucky. Political gamesmanship and mistrust between the eight nations whose territory extends into the Arctic Circle have long fragmented scientific efforts there.



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Snow bound. *Researchers study the Arctic climate.*

But as the Cold War melts away, these nations have warmed to the idea of scientific cooperation. Two weeks ago, this unprecedented comity culminated in the formation of a non-governmental International Arctic Science Committee (IASC) by leading scientific organizations in those eight nations. According to its founding articles, the IASC should make it easier for scientists to plan and carry out arctic experiments with their international counterparts.

The announcement comes at a particularly fortuitous time, since the arctic region has a major influence on global weather patterns and ocean circulation, making it a prime location from which to study global warming.