CANADIAN BUDGET

Big Bucks for New Equipment

OTTAWA—The Canadian government is launching a $1.5 billion program to upgrade equipment and labs at the nation's research universities. The effort, part of the government's 1997 budget announced last week, comes amid continuing cuts in funding for the country's research granting councils, which provide the bulk of support to university researchers. The infrastructure program is expected to help Canadian scientists remain competitive with their global colleagues. It is also seen as a sign of renewed federal support for science after a 3-year austerity binge triggered by a soaring budget deficit, as well as a nod to an important constituency before the anticipated June election.

"The infrastructure program deserves our unqualified support," says University of Western Ontario President Paul Davenport, one of several administrators "elated" by the news. Amid the euphoria, however, university officials are sobered by a third year of cuts, averaging 15% over 3 years, in the budgets of the three granting councils. The councils must also absorb an extra $7 million contribution to the Networks of Centres-of-Excellence program, a joint university-industry effort that is becoming a permanent feature of the research scene (*Science*, 14 February, p. 922). "All of us will have to continue to work hard to get the budgets of the three granting councils strengthened," says Davenport. Industry Minister John Manley agrees, calling raising those allocations "the next step" in the budget process.

The 5-year infrastructure program will be run by an independent organization, the Canada Foundation for Innovation. The government will contribute $600 million, instantly making it Canada's largest foundation, and universities must put up at least a matching share of the federal funds for any project the foundation approves. It is the first time the government has made a significant amount of money available for new research equipment and facilities at campuses across the country.

Academic officials are already drawing up their wish lists. University of Toronto President Rob Prichard dreams of facilities that aren't "museum pieces" for Nobel laureate John Polanyi and the rest of the chemistry department, along with improvements to dozens of other departments. Then, there are the print collections and electronic databases for the library. "We could easily use up at least $115 million," he says.

Prichard is not alone in imagining what the new foundation could mean for his institution. University of Montreal Rector René Simard has his eye on a Level-3 containment facility to conduct research on deadly viruses and bacteria. University of Lethbridge (Alberta) President Howard Tennant is riffling catalogs for the price of an 800-megahertz nuclear magnetic resonance device for the neuropsychology center. "[Canada] has been losing many of [its] top people to other institutions in other countries," says University of Regina (Saskatchewan) President Donald Wells, "not so much because of salary levels, but because we don't have modern facilities. This program will go a long way to reverse that."

Some officials are worried, however, that the foundation's requirement of matching funds will favor the nation's so-called "big 10" universities because of their larger endowments and stronger corporate ties. "It's going to be more and more difficult for the smaller places to stay in the game," says Arthur May, president of Memorial University in Newfoundland. "That's not a good thing. [It's important] to have a thousand-flowers-bloom approach."

Science Minister Jon Gerrard, who championed the program, believes that smaller universities can hold their own, citing the decision by Acacia University in Nova Scotia to be the first in Canada to give computers to all its students. And he expects them to raise a stink if they are being shortchanged. But John Evans, the chair of the new foundation, says it may be necessary for smaller institutions to join forces to be successful. "Some small institutions actually may not be able to mount the kind of programs on their own," says Evans, former president of the University of Toronto and current chair of Allelix Biopharmaceuticals Inc. "But in combination, they can put together a superb program."

The new effort may also lay to rest an ongoing dispute between the federal and provincial governments over responsibility for academic research infrastructure. The dispute has left universities scrambling to recoup overhead costs that neither government entity feels it should pay. Although many observers see the foundation as a tacit admission of federal responsibility, Manley insists that the scheme sets "no more binding precedent" than earlier federal programs to improve roads or sewers within municipalities. In the meantime, science administrators are content to compete for what Medical Research Council President Henry Friesen calls "a breathtaking" new expression of federal support for science.

–Wayne Kondro

Wayne Kondro is a free-lance science writer in Ottawa.

ARCHAEOLOGY

Monte Verde: Blessed But Not Confirmed

It was the ultimate field trip. A dozen prominent archaeologists flew to Chile in January to see a crucial site in a long-standing dispute over when humans first reached South America. And when the expedition announced earlier this month that the Monte Verde site was indeed 12,500 years old—and so the oldest accepted human site in the Americas—*The New York Times* compared it to "aviation's breaking of the sound barrier." Thanks to this trip, the paper concluded, the field had "finally come to a consensus" and had abandoned the leading model for the peopling of the New World. That model proposes that the first Americans were the Clovis people, big-game hunters who came over the Bering land bridge and then swept rapidly through the Americas about 11,500 before the present. One member of the expedition told *The Washington Post*: "It totally changes how we think of the prehistory of America." Or does it?

Peer review. A dozen archaeologists approved Monte Verde as pre-Clovis—but the debate isn't over yet.

In a discipline as contentious as this, one field trip is unlikely to unite the warring factions. A few skeptics remain unconvinced: "Total consensus will only come when the final report is out and the pattern repeats itself at other sites," says archaeologist Tom Lynch, director of the Brazos Valley Museum in Bryan, Texas, who doubts that humans were at Monte Verde so long ago. And even though opinion has been gradually moving away from the Clovis-first model for years (*Science*, 19 April 1996, pp. 346 and 373), many bristle at the implication that the discipline can be regulated by one or two key people. The Monte Verde trip, they point out, came down to the conversion of just two leading researchers—hardly a

paradigm shift.

The trip itself was set up to showcase 2 decades of work by the site's tireless excavator, Thomas Dillehay of the University of Kentucky. Those who have seen his evidence in recent years say it is remarkably thorough and convincing. The coup de grâce came in a long-awaited 1300-page monograph to be published in March by the Smithsonian Institution and given to members of the expedition. This opus offers new radiocarbon dates on wood to show that humans lived at the site at least 12,500 years ago, and describes in detail their footprints, stone tools, and shellfish and other materials brought in many miles from the coast. The Monte Verde people lived in huts with wooden frames and animal-hide roofs—unlike anything found at Clovis sites. The monograph is "almost overkill," says archaeologist David Meltzer of Southern Methodist University in Dallas, and it had convinced many researchers even before the trip, including one prominent skeptic, archaeologist Dena Dincauze of the University of Massachusetts.

The one member of the trip who was not persuaded beforehand was C. Vance Haynes of the University of Arizona. And his epiphany is indeed significant, archaeologists admit, because his stature as a leading Clovis expert will influence nonspecialists and the undecided. He and the others inspected the site, which has been mostly destroyed by farmers and now blends into a sandy hillside. But new trenches allowed the group to see the artifact-bearing layer in a "secure stratigraphic context," topped by a layer of peat dated to 10,300 to 12,000 years ago. "So, the artifacts had to be older than that, and I had to buy those dates," says Haynes. With most of the group already persuaded, "I was the heavy," he recalls. After days of intense debate, the moment of truth came at a bar in a nearby town. "I asked if people would agree that the site was 12,500 years old," recalls Meltzer. Everyone did.

And even though that date is only 1000 years older than the oldest dates for Clovis sites, it spells trouble for models that suggest that settlers walled an ice-free path in Canada when glaciers retreated about 12,000 years ago, making it unlikely that they reached Chile. Alternate models suggest that the first settlers traveled by boat or arrived before the ice sheets formed.

As news of their acceptance of the site spread, community reaction was decidedly mixed. Some were relieved that such a prominent skeptic as Haynes had publicly accepted a pre-Clovis site. Others were a bit irritated by what they saw as an overblown press response. "What's the big fuss?" wonders University of Texas geoarchaeologist Karl Butzer, who had considered the published date of 12,500 on Monte Verde "uncontroversial" for some time. Clovis expert Reid Ferring of the University of North Texas agrees: "I've been teaching my students for years that there is sufficient evidence that Monte Verde is pre-Clovis. You don't have to go to Chile to figure that out." In his view, the trip was chiefly a public benediction of the site: "I've been teasing them that they should have carried incense burners." Jacques Cinq-Mars, an archaeologist at the Canadian Ministry of Civilization, agrees: "There's a paradox there. You're glad it's been done. At the same time, it's a bit irritating that the site has now been blessed by the Inquisition." It's especially irritating to those who disagree. Despite the publicity, insists Lynch, "these things aren't proven overnight."

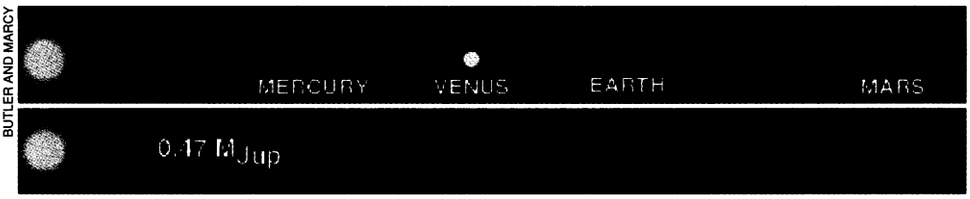
–Ann Gibbons

ASTRONOMY

Is First Extrasolar Planet a Lost World?

With perhaps a dozen extrasolar planets apparently in the bag, worlds around other stars may have started to seem commonplace. A paper in yesterday's issue of *Nature*, however, could dispel any complacency. In it, a respected Canadian astronomer labels the first apparent discovery of a planet orbiting a sunlike star a case of mistaken identity.

David Gray, who specializes in studies of stellar spectra at the University of Western Ontario, claims that the team of Swiss researchers who announced the discovery almost a year and a half ago were misled by a subtle, periodic signal in the spectrum of the star 51 Pegasi. Based on his own observations, Gray says the signal, originally attributed to the gravitational tug of a roughly Jupiter-sized planet, was actually generated by a complex sloshing on the star's surface. "The planetary hypothesis simply can't explain the observations," says Gray. "It's gone. Period."



BUTLER AND MARCY

Now you see it ... The star-hugging planet inferred from a wobble in the spectrum of 51 Pegasi.

As preprints of Gray's paper began circulating last week, his blunt conclusion sparked some heated exchanges. The planet's original discoverers, Michel Mayor and Didier Queloz of the Geneva Observatory, along with Geoff Marcy and Paul Butler of San Francisco State University, who quickly confirmed the finding 15 months ago, have already posted their riposte on the World Wide Web. They label as "extraordinarily premature" Gray's claim that the signal of the "planet" is accompanied by a change in the shape of spectral lines that no planet could cause—pointing out that he has analyzed just 39 measurements of one line in the star's spectrum in observations spread over about 7 years. They also single out what they see as weaknesses in Gray's own explanation for the signal, which relies on complex surface oscillations never before seen in a sunlike star.

Other astronomers, however, think Gray's critique of the 51 Pegasi planet deserves at least a hearing, and that oscillations like the ones he is invoking—if they really occur—could be a confounding factor in other planet searches. "It raises an alarm bell of sorts," says Aleksander Wolszczan of Pennsylvania State University, whose earlier discovery of three planets around an exotic star called a pulsar has stood up to scrutiny. "[Gray] may well have overstated the case a little bit," says William Cochran of the University of Texas, Austin, "but it sort of suggests an alternative explanation."

The dispute centers on dark absorption lines in the spectrum of 51 Pegasi—valleys in its spectrum that result as elements like nitrogen, iron, and calcium in the star's atmosphere soak up light coming from below. The planet searchers had monitored hundreds of these lines for a minute Doppler shift indicating that the star was wobbling toward and away from Earth as a planet tugged it to and fro. The data showed "an almost perfectly sinusoidal Doppler curve," says Butler—which suggested to Mayor and Queloz that a planet was circling 51 Peg every 4.23 days (*Science*, 20 October 1995, p. 375).

When Gray monitored just one iron line at much higher resolution, however, he came to a contrary conclusion. The wobble due to a planet should shift the wavelength of the line without altering its appearance, but Gray's iron line seemed to change its shape and its depth over the same 4.23-day period as the wobble the planet searchers identified. Only the star itself could be responsible for changes in line shape, says Gray, who concludes that the Doppler curve "has been erroneously interpreted as a planetary sign."

In their joint response on Marcy and Butler's Web site, the Geneva and San Francisco groups point out that an earlier study of 51 Peg by a group of astronomers at Texas, including Cochran and Artie Hatzes, had