

## VENEZUELA

## Dismissal of Senior Scientist for 'Nonattendance' Shakes Community

**CARACAS**—The dismissal of a top Venezuelan scientist from a government research institute and threats to dismantle one of its most successful programs have revived accusations that the government of President Hugo Chávez is engaging in political persecution. Reinaldo Di Polo, a physiologist with more than 40 years' experience and over 4000 bibliographic citations, learned at the end of July that he was to be removed from his post at the Venezuelan Institute for Scientific Research (IVIC), the country's premier science agency, on the grounds of "nonattendance" on unspecified dates between January and June of this year.

In statements to the press, IVIC Director Ángel Viloría described the matter as "purely administrative" and accused the press of politicizing it. "It's not a dismissal," Viloría said. "The man retired on 1 July 1997. He spent all the budget and didn't show up for work. We don't know if all those scientific

articles he says he published were done elsewhere." (Viloría did not return telephone calls from *Science* seeking further comment.)

Di Polo, along with two dozen other IVIC researchers, belonged to a program known as the PLI (*Permanencia en Labores de Investigación*), which allows retired scientists to continue working. PLI was introduced because Venezuelan law allows academics to retire after 25 to 30 years' service, precisely when a research scientist is at his or her most productive. PLI members represent about 20% of IVIC's research staff, but on average, PLI members are responsible for 50% more articles published in peer-reviewed journals than other IVIC staff, according to PLI member Gioconda San-Blas, head of the mycology laboratory.

Since retiring, Di Polo—who won Venezuela's national science prize in 2000 for his work in neurophysiology—has produced 38 research papers in international journals.

More than half of the research, he says, was done at IVIC. "Nowhere in the world," Di Polo says, "do research scientists have to punch a card." Viloría, however, is not impressed with academic credentials. "We can't give preponderance to indices of citations created by commercial consortia. We'll have to evaluate how much sense it makes, for the future of the country, to continue counting publications and prizes," he said to the press.

In May, President Chávez called on science minister Jesse Chacón, a retired army lieutenant, to "turn the screws" on unproductive scientists and demanded that research projects have direct, practical applications (*Science*, 29 May, p. 1126). Viloría, whose own research specialty is butterfly taxonomy, said, "We can't keep giving investment priority to issues that are of no interest to the state." PLI is under review, and "it is likely that this special regime will disappear."

When Chacón visited IVIC on 25 August, he was handed a letter from its Association of Researchers (AsoInVIC), pointing out that, far from being an ivory tower, IVIC addresses issues vital to the country's development. "Just to cite a few examples," the association says, "in the IVIC, research is carried out into many diseases, including

## EDUCATION

## Science Needs Kids With Vision

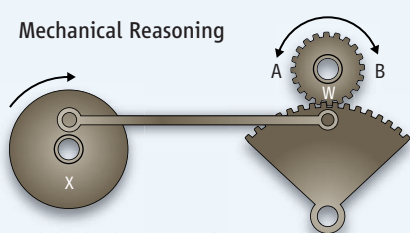
Albert Einstein, who was famously able to conduct physics experiments in his head, once said his "elements of thought are not words but certain signs and more or less clear images." Einstein would probably make the cut in most modern-day science talent searches. But many of those with exceptional spatial abilities are being missed, claims psychologist David Lubinski of Vanderbilt University in Nashville.

Lubinski, who put his case last week to the National Science Foundation's National Science Board at a workshop on innovation, says that despite their importance in science, particularly in fields such as engineering, robotics, or astronomy, spatial abilities are getting short shrift both in school curricula and in programs trying to spot precocious youths. He estimates that such programs overlook more than half of those with exceptional spatial abilities. "How many Edisons and Fords are we missing?" he asks.

According to educational psychologist David Lohman of the University of Iowa in

Iowa City, spatial ability is "the ability to generate, retain, retrieve, and transform well-structured visual images." Tests cover

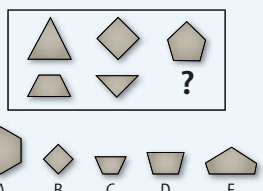
**Mechanical Reasoning**



While wheel X turns in the direction shown, wheel W turns

A. in direction A.  
B. in direction B.  
C. first in one direction and then in the other.

**Abstract Reasoning**



areas such as visualization (figuring out what happens when a piece of paper is folded, for example), mentally rotating an object, and mechanical reasoning (see illustration). Many talent hunts for gifted elementary and high school students rely on the results of the SAT, which assess verbal and math—but not spatial—skills.

Lubinski and Camilla Benbow of Vanderbilt have found from their analyses of data from the Study of Mathematically Precocious Youth, begun in 1971 at Johns Hopkins University in Baltimore, Maryland, that there is wide variability in spatial abilities even among the one in 1000 children who score over 700 on the math SAT before age 13. Their latest paper, scheduled for publication in the November issue of the *Journal of Educational Psychology*, shows that spatial abilities "behave in the same way in an average sample" as they do in the hyper-precocious, says Lubinski. Spatial ability roughly correlates with math and verbal ability, but many spatially gifted people are not in the top tier of math or verbal ability. Using data from Project TALENT, a 1960 survey of 400,000 U.S. high school students, they found that among those who scored in

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### A Breathalyzer for Cancer

A team of researchers may have come up with a golden idea for diagnosing lung cancer. By coating tiny nuggets of gold with a thin layer of organic material, they've developed an "electronic nose" that, with some additional work, could spot lung cancer instantly by analyzing someone's breath. <http://bit.ly/3xNdJL>

### Don't Stand So Close to Me

In a famous episode of the TV show *Seinfeld*, a "close talker" makes others uncomfortable by standing mere centimeters from their faces while speaking. What makes this invasion of our personal space so uncomfortable? A new study fingers the amygdala, a region of the brain that acts like a warning bell when someone gets too close for comfort. <http://bit.ly/3Rr50d>



### Glyptodonts Were Savvy Batters

What do ancient armored mammals have in common with Babe Ruth? They both took advantage of the "sweet spot." New research suggests that some species of giant mammals called glyptodonts swung their hefty tails like baseball bats, landing powerful blows with the spot on their tails that minimizes potentially harmful vibrations for the slugger. <http://bit.ly/fiHid>

### Global Warming Warps Marine Food Webs

Teasing apart the complex ways in which global warming will affect ocean life has been tough. But new research suggests that a simple ecological theory may explain at least one piece of the puzzle: the effect on marine food webs. And the news may not be all bad. <http://bit.ly/1br735>

Read the full postings, comments, and more on [sciencenow.org](http://www.sciencenow.org).



**No slacking.** IVIC Director Ángel Vilorio (right), with Venezuela's science minister Jesse Chacón (center), ejected one of IVIC's most-published researchers for being out of the office.

dengue, malaria, AIDS, and tuberculosis."

PLI, says Flor Pujol, who is on the board of AsoInIVIC, "is not just good, it is vital, because there is no new generation [to take over]." IVIC researchers are deeply concerned over budget cuts and what they say is a brain drain stimulated by the authorities' dismissive attitude toward them.

Scientists' greatest fear, however, is that the government is intent on eliminating "bour-

geois science" altogether. Claudio Bifano, president of the Venezuelan Academy of Physical, Mathematical, and Natural Sciences, says the country's scientists are "trying to defend internationally accepted principles and values of science and education." The government, he says, "wants to transform this country into Cuba—and that is the real danger."

—PHIL GUNSON

Phil Gunson is a writer in Caracas.

the top 1% of spatial ability, 70% did not make it into the top 1% of math or verbal ability. That means they would have been overlooked by most talent searches. But an 11-year Project TALENT follow-up showed that spatial abilities tend to correlate with scientific achievement. For example, 45% of those with science and engineering Ph.D.s were in the top 4% of the spatial ability range, compared with 25% of the bachelor of science degree holders. Fewer than 10% of the Ph.D.s were below the top quartile in spatial ability.

Such data are news even to people in the field. "I was really amazed at the numbers," says psychologist Nora Newcombe of Temple University in Philadelphia, Pennsylvania, principal investigator for the Spatial Intelligence and Learning Center, a consortium that does research on spatial skills and how to improve them. Newcombe agrees that people with such skills are not getting the attention they deserve in school. As Lubinski says, the typical "highly verbal" high school curriculum "turns them off; they love classes with a big lab component."

The Belin-Blank International Center for Gifted Education and Talent Develop-

ment at the University of Iowa, where Lohman is the research director, is interested in developing and validating a new spatial test to add to those it uses for its talent search and has applied for a foundation grant. A nationally normed test in which results can be reliably compared with math and verbal test scores will offer "a new dimension to help us understand why some are more [scientifically] creative than others," says center director Nicholas Colangelo.

Everyone agrees that spatial tests will disproportionately select boys. Larry Hedges, a statistician at Northwestern University in Evanston, Illinois, has estimated that the ratio of boys to girls in the top 5% of spatial ability is more than 2.3 to 1. For mechanical reasoning, it's about 11 to 1. But Hedges also points out that spatial ability is highly malleable: "You can change it much more than IQ or verbal or math abilities."

"It's of concern that you would over-identify males if you just make a decision on the basis of this," notes Newcombe. But, she says, more focus on spatial ability is long overdue: "It's an orphan skill."

—CONSTANCE HOLDEN