



VENEZUELA

As Research Funding Declines, Chávez, Scientists Trade Charges

Venezuelans have grown accustomed to blunt remarks from their president, Hugo Chávez, elected in 1998 with an agenda of empowering the poor. Still, academics were taken aback this month when Chávez turned his scorn on them: During his weekly television program on 3 May, *Aló Presidente*, Chávez said that researchers should stop working on “obscure projects,” such as whether life exists on Venus, and instead go into the barrios to make themselves useful. The words sent a chill through the scientific community, as did Chávez’s comment that his recently appointed minister for science, technology, and intermediate industry, Jesse Chacón Escamillo, should “put the screws” on “feeble scientists” to get better results.

To many observers, it was another sign of the growing tension between Chávez and the academic establishment, particularly involving well-established research centers in Caracas. Nerves were already on edge following Chávez’s dismissal in April of science minister Nuris Orihuela, a geophysical engineer, and her replacement by Chacón, an engineer and Army lieutenant. Critics say Chacón has scant scientific credentials but has been close to Chávez since at least 1992, when he backed Chávez’s failed coup attempts.

Disaffected researchers say they fear that science funding is becoming more politicized. This is one of many concerns they’ve added to a growing catalog of perceived government failures or threats. Heading this list is a complaint that the government has made broad cuts in funding for institutions that support research. This has come partly in response to declining government petroleum revenues. But critics say the trouble runs deeper—that research is being mismanaged, and that the government has fired, demoted, or blacklisted dissidents.

Claudio Bifano, president of the Venezue-



In the streets. University of Simón Bolívar students protested budget cuts in Caracas earlier this month.

Comrades. Chávez (dark shirt), during the 2008 regional elections with candidate, now science minister, Jesse Chacón (third from left).

lan Academy of Physical, Mathematical and Natural Sciences in Caracas, sent a letter with outstanding grievances to *Science* this month (www.sciencemag.org/cgi/content/abstract/1176733). They are, he wrote, “just a fraction of the many actions that clearly reveal an aim of the government to control all of the national scientific activity and the higher education system, putting Venezuela’s scientific activities at risk.” Bifano says that the government recently decreed the creation of about 40 new universities—on top of 51 existing public and private institutions. He says that Venezuela has insufficient academic resources for 90-odd universities and does not need that many.

“We are worried about the dilution of funding, which could lead to the closure of universities not aligned to government policies,” adds biologist Roberto Cipriani, head of environmental studies at the Simón Bolívar University (USB) in Caracas. Scientists also view a 3-year-old program called LOCTI, which taxes companies to create a fund for research and innovation, as a disappointment. Publication indexes show that peer-reviewed publications from Venezuela have declined recently, says Cipriani. He notes that the ISI Web of Knowledge shows that science and technology articles written by Venezuelans dropped 15%, from 968 in 2006 to 831 last year.

Other groups are protesting what they view as threats to research. A petition by the Caracas chapter of the Venezuelan Academy for the Advancement of Science, posted last week for comment (<http://asovac.net/bitacora/?p=3372>), states that the “fundamental pillars of Venezuelan science are in grave danger.”

It claims that a key government science program—Misión Ciencia—has produced few tangible results despite massive spending and deplores budget cuts ordered in March that, it says, translate into a 33% reduction in operating budgets for the Central University of Venezuela (UCV), in Caracas, and several other institutions. These are having “a severe effect on [UCV’s] basic scientific and technological research programs,” the declaration adds.

On 14 May, about 20 scientists stood in silence for 5 minutes during a meeting of some 250 researchers at UCV to protest Chávez’s statements on *Aló Presi-*

dente and the government's withdrawal of certain awards funded by LOCTI. The protesters from the Venezuelan Institute for Scientific Research remained silent because the ministry had told them to make no public statements, say sources in Caracas who did not want to be identified.

Whatever its flaws, LOCTI has been helpful to some institutions, researchers say. USB, the largest single recipient of LOCTI cash, received about 100 grants a year from 2006 through 2008, about 20% of the amount given to universities and agencies, says USB president and chemist Benjamin Scharifker. USB marine resources manager Eduardo Klein, a professor in the department of environmental studies, says he has been able to build labs and buy equipment that would not have been possible without LOCTI—including a 4000-square-meter, \$7 million center for marine biodiversity now under construction. But Klein adds that funding needs are determined at the top: "The ministry decides on projects without our participation."

While some institutions have done well, scientists say that critics of government policy rarely escape punishment. A widely cited example this year is biologist Jaime Requena, a Cambridge, U.K.-educated professor at the government's Institute for Advanced Studies (IDEA) in Caracas. Requena and his supporters say that IDEA's director stripped Requena of his professorship just before his retirement, costing him his pension rights. IDEA took this step, according to an independent group, the Human Rights Commission of the Venezuelan Association for the Advancement of Science, after Requena published a letter in *Nature* criticizing the government for restricting support of the social sciences. Requena wrote that this government decision was one reason why Venezuela's scientific publications have fallen to a 25-year low point.

Speaking for the science minister, IDEA president Prudencio Chacón, who is not related to the minister, denied that the government is imposing political control over science, stifling dissent, or cutting research budgets. He also said that Requena was dismissed because "he worked in two places simultaneously," left work "several times without permission from his supervisor," and because IDEA requested the purchase of software that Requena had developed. Requena and his backers deny the charges. IDEA's statement recognizes the significance of the dispute, however, saying it has become one of the "political flags" of government critics.

—BARBARA CASASSUS

Barbara Casassus is a writer in Paris.

SWINE FLU OUTBREAK

New Details on Virus's Promiscuous Past

An international team of scientists working at breakneck speed has provided the most detailed description yet of the origins of the novel H1N1 swine flu virus now causing a global outbreak. The study, published online by *Science* on 22 May (www.sciencemag.org/cgi/content/abstract/1176225), has good news about the prospects for making a vaccine against the virus. It also raises the intriguing possibility that a species other than pigs might have harbored a precursor to the virus.

Much of the data have already dribbled out, released as soon as it was generated. But this new study, which involved a team of 59 researchers led by investigators from the U.S. Centers for Disease Control and Prevention (CDC) and the University of Cambridge, U.K., is the first to pull it all together. "The people at CDC deserve to have this published," says leading flu expert Robert Webster of St. Jude Children's Research Hospital in Memphis, Tennessee. "They bust their butts and have done the lion's share of the work and tried to be as open as possible."

The authors reconstructed the puzzling past of what's known as influenza A 2009 (H1N1) by analyzing 76 isolates from people in Mexico and the United States. The paper begins the somewhat operatic and knotty story of this outbreak's origins with an H1N1 first isolated in swine in 1930, which itself was a close relative of the virus that caused the 1918 pandemic in humans. Unlike flu viruses that affect humans, the eight influenza genes in this swine H1N1 changed very little for 6 decades. In 1998, researchers discovered that this rock-steady swine H1N1 had combined with a human H3N2 and a U.S. avian virus. This so-called

triple reassortant spread to Asian pigs, and many different variants soon began popping up in swine all over the world.

In a separate drama, related but distinct H1N1 strains have long circulated in humans. An H1N1 caused the 1918 pandemic and remained the predominant strain until it was replaced by an H2N2 that caused a new pandemic in 1957. The human H1N1 then suddenly reappeared in 1977 and has been making the *Homo sapiens* rounds ever since. Then an H3N2 strain that caused the 1968 pandemic replaced the H2N2. So today, both H3N2 and a human H1N1 cocirculate, along with two strains of influenza B.

Now along comes the swine flu outbreak of April. The paper explains that this novel H1N1 has two genes from avian influenza that entered Eurasian swine in 1979, three from the old-fashioned H1N1 in North American swine, two from the triple reassortants in North American swine, and the final one from humans transmitted to us from birds in 1968. That head-spinning mix has never been seen before, and given its genetic distance between known strains, CDC chief influenza investigator and co-author Nancy Cox said the virus was likely lurking around somewhere long before it jumped into humans. "We do not know if the virus entered the human population directly from swine or via an intermediate host," said Cox.

The encouraging news for vaccine development is that the many isolates of the new viruses analyzed in this report showed little variation, much less than typical seasonal influenza viruses. This makes it "much, much easier" to make a vaccine, said Cox.

—JON COHEN

Gene Segments, Hosts, and Years of Introduction

