Abelson Seminar: Searching for Climate Change’s “Tipping Points”

Earth’s poles are no longer the terra incognita of ancient maps, thanks to unprecedented scrutiny by those tracking the effects of global climate change in these vulnerable areas. But scientists still face unknowns about when and how polar warming will have an irrevocable effect on the rest of the planet, said speakers at the annual Philip Hauge Abelson Advancing Science Seminar.

The researchers gathered at AAAS on 30 October offered several glimpses of the rapidly changing polar regions at which ice sheets crumble; animals like the Antarctic Adélie penguin dwindle in number and the exotic tusked narwhal change their migration patterns; and native communities relinquish their hold on centuries-old cultural and economic traditions.

Humans have enjoyed a relatively stable and mild climate over the past 10,000 years, but there are abundant signs that this “sweet spot” may be coming to an end, brought on largely by human causes, said keynote speaker Robert W. Corell, director of the Global Change Program for the H. John Heinz Center for Science, Economics and the Environment.

Corell said the troublesome signs—from bark beetles that turn Alaska forests into tinder and shrinking support for ice sheets—are already visible across the polar regions. Once these events occur, “a return to the past looks virtually impossible, at least on the time scales we know,” he cautioned.

The “New Horizons in Polar Science” seminar was planned in recognition of the International Polar Year and in honor of Philip Abelson, who served as editor of the journal Science for 22 years, and then as senior advisor to AAAS until shortly before his death at the age of 91.

Several of the speakers mentioned personal connections to Abelson, including James G. Anderson, a Harvard University professor of atmospheric chemistry whose father taught Abelson. Anderson’s presentation included several maps of a drowned Harvard Square, a likelihood dependent on different models of Greenland ice sheet melting.

Several other speakers presented studies on the human dimension of climate change as one focus of International Polar Year research. Shrinking Arctic sea ice is opening up new possibilities for offshore fishing, shipping lanes, and oil and gas development at the same time that key traditional resources such as caribou herds are disappearing, the scientists noted. But almost nothing is known about “the critical thresholds of adaptability and resilience”—the human tipping points—for Arctic people in a post-warming world, according to research by Norwegian anthropologist Grete K. Hovelsrud of the Center for International Climate and Environmental Research.

As climate studies continue at an urgent pace, the poles have become a laboratory for some unusual experiments probing the unseen in space and on Earth. For instance, the South Pole is one of the best places on the planet to collect data on the infant universe, according to John R. Carlstrom, professor of astronomy and astrophysics at the University of Chicago.

“If you want a better site, you better launch your experimental satellite,” Carlstrom said. The dry, cold, and clear atmosphere at his Antarctic telescope station offers a relatively unimpeded look at the cosmic microwave background radiation, the fingerprint of the Big Bang, as well as signs of dark matter and dark energy, he explained.

Nearby on the continent, an international team of neutrino researchers is hard at work on IceCube, a massive “crystal ball” of thousands of detectors dangled two kilometers deep within the ultra pure ice sheet. In the next 10 years, the scientists hope to capture a million of the elusive subatomic particles as they bombard Earth at energies higher than those produced in the laboratory, explained Francis Halzen, a professor of physics at the University of Wisconsin.

In his 1911 expedition journal, British explorer Robert Falcon Scott called the Antarctic’s Lake Bonney region “the Valley of the Dead.” But modern explorers like John C. Priscu, a professor of ecology at Montana State University, see instead “an oasis of life in a polar desert” below the ice sheet. Priscu said that by using DNA sequencing, he and others have identified a diverse microbial community that may contain “museums of ancient DNA” and a new set of clues to how life evolved on Earth.

AAAS Chief Executive Officer Alan I. Leshner said the seminar’s founder would have been pleased by the cutting-edge polar research. Abelson “had almost no interest in the past,” said Leshner, executive publisher of Science. “He was a man who was only interested in where science was going.”

——Becky Ham

INTERNATIONAL

AAAS, Rwandan Leaders Discuss S&T Development

With Rwanda working to address chronic poverty and the legacy of its 1994 genocide, AAAS President David Baltimore met with Rwandan President Paul Kagame to discuss how science-related development and education could contribute to peace and prosperity.

Romain Murenzi, Minister of Science, Technology and Scientific Research; AAAS President David Baltimore; Rwandan President Paul Kagame; and Tom Wang, AAAS director for International Cooperation.

Lacking natural resources such as oil or minerals, the African nation has an ambitious development plan that aims instead to build a knowledge-based economy. Kagame has
pledged to double research spending from the current 1.6% of gross domestic product to 3% over the next 5 years.

Baltimore visited Rwanda from 10 to 13 October, joined by Tom Wang, AAAS director for International Cooperation, to better understand its S&T capacity and needs. Hosted by Romain Murenzi, Rwanda’s minister for Science, Technology, and Scientific Research, they visited education and research institutions and health facilities—and came away deeply impressed with the nation’s commitment.

Rwandan leaders see science-related development “as an engine of economic progress and understand that this involves both a widening of scientific literacy and an indigenous research capability,” Baltimore said after the visit. “Our hope is that a continuing relationship between Rwanda and AAAS will allow our organization to act as an intermediary between African countries and the skills available within our membership.”

During an hour-long meeting, Kagame detailed Rwanda’s S&T development and education priorities, noting that building institutions is critical for building capacity. He also discussed energy issues and the importance of partnerships that address development priorities of Rwanda.

Baltimore described AAAS and its interest in the globalization of the science enterprise. He expressed support for Rwanda’s efforts and suggested that it also has an opportunity to become a cutting-edge center for primate studies. In addition, he discussed the importance of education in preventing HIV transmission. Baltimore, a molecular biologist and 1975 Nobel laureate, is president emeritus and Robert Andrews Millikan Professor of Biology at the California Institute of Technology.

After the meeting, Murenzi said that Rwandan leaders “look forward to the ongoing support and collaboration with AAAS.” His Excellency Paul Kagame and his government “have committed themselves to meeting the challenges of building an economy based on science, technology, and innovation and making Rwanda a sub-Saharan technology hub,” he added. “In the words of His Excellency: ‘We will continue to invest in our people, and we will strive to open up the frontiers of science, technology and research as we broaden our trade links with our neighboring countries and beyond.’”

Baltimore and Wang met with other senior officials, including Health Minister Jean Damascene Ntawukulirayo; Minister of State in charge of HIV/AIDS Innocent Nyaruhirira; Kigali Institute of Science and Technology Rector Chrysologue Karangwa; and Kigali Health Institute Rector Desire Ndushhabandi, as well as U.S. Ambassador to Rwanda Michael Arietti. The trip received extensive coverage in Rwandan news media.

Most residents of the small, landlocked nation are subsistence farmers, and gross per capita income is less than $1 a day. Rwanda continues to deal with the aftermath of civil war that culminated in genocide in 1994, leaving some 800,000 people dead, mainly ethnic Tutsis as well as politically moderate Hutus. As a result, there remains a significant shortage of educated workers.

Recently, there has been much positive momentum: Between 1995 and 2005, annual economic growth averaged 7.4%, the World Bank says. Both the World Bank and the U.K. Department for International Development are assisting Rwanda’s effort to build S&T and education capacity.

“When people hear the word ‘Rwanda,’ the first thing they think is ‘genocide,’” Baltimore said. “What they don’t realize is that the country is on a trajectory to go beyond that…It is very impressive how 13 years later, the leaders have calmed down the passions and are thinking and working very hard for the future of their country.”

**COMMUNICATION**

**Science Receives Prince of Asturias Award**

The journal *Science* received the 2007 Prince of Asturias Award in Communication and Humanities on 26 October, after a week of welcome for the journal and the rest of this year’s prize winners in Oviedo, Spain. *Science* shares this year’s award with the journal *Nature* for their pivotal roles in communicating scientific research to the international community.

At a grand ceremony held at the Teatro Campoamor de Oviedo and attended by Her Majesty Queen Sofia, *Science* International Managing Editor Andrew Sugden and News Editor Colin Norman accepted the award from His Royal Highness Prince Felipe de Borbón, honorary president of the Foundation and heir to the throne of Spain.

The Foundation, formed in 1980, honors scientific, technical, cultural, social, and humanitarian work carried out internationally by individuals, groups, or organizations, across eight categories.

This year’s winners include American musician Bob Dylan, Israeli novelist Amos Oz, and former U.S. Vice President and recent Nobel Peace Prize recipient Al Gore, among others.

“The Prince of Asturias Foundation awards are unusual in honoring such a broad diversity of endeavors, and that’s part of what makes them special,” Norman said.

“It was a huge honor to be on the same stage as all the other prize winners,” said Sugden, who recalled moving speeches from several of the winners and remarks by the Prince at the ceremony “that wove together the various awards in a common and optimistic thread.”

At least one connection was recognized by Gore himself, this year’s winner of the International Cooperation Award. In his acceptance speech, he acknowledged a “special debt” owed to *Science* and *Nature* for publishing much of the research behind his famed slide show on the effects of global climate change.

Andrew Sugden and Prince Felipe de Borbón.

Sugden and Norman attended two formal press conferences and other events associated with the awards in Oviedo, including a discussion of the challenges of scientific publishing at the University of Oviedo library.

“The university itself is celebrating its 400th anniversary this year, and it was a real treat to discuss modern scientific communications in such a historical setting,” Norman said.

As part of the award, *Science* received a bronze sculpture—designed by Spanish artist Joan Miró before his death in 1983—and 25,000 euros in prize money, which *Science* will use to make the journal more accessible to non-English speakers, including Spanish speakers. For more information about this year’s prize, including a video statement from *Science* Executive Editor Monica Bradford, see www.fundacionprincipedeasturias.org.

—Becky Ham

**2008 ELECTION**

**A Call for Nominations**

AAAS members may suggest nominees (including themselves) for president-elect and the Board of Directors for election in the fall of 2008. For a list of this year’s candidates, see AAAS News and Notes in the 31 August 2007 issue of *Science*; for a list of current Board members, see the masthead page of any recent issue of *Science*.

Please send the suggested nominee’s curriculum vitae no later than 30 December to Gretchen Seiler, AAAS Executive Office, 1200 New York Avenue, N.W., Washington, DC, 20005. Suggested nominees will be considered by the AAAS Committee on Nominations at their winter meeting.