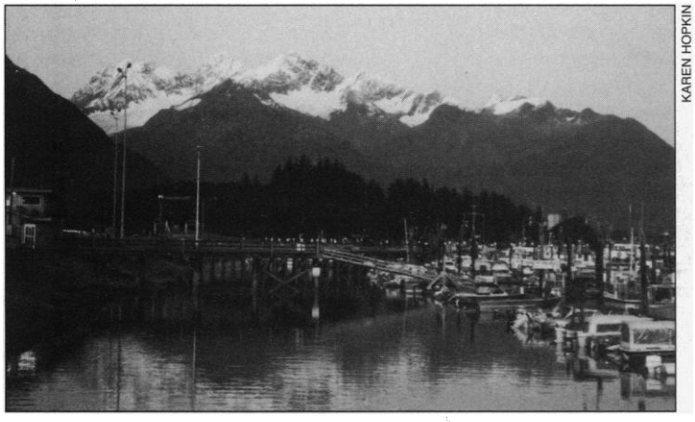
edited by KAREN HOPKIN

Arctic Division Meeting Addresses Environmental Change

Most scientific conferences commence with the pealing of an electronic bell or an announcement over the PA system. The 1992 AAAS Arctic Division meeting came to order when division secretary Gunter Weller bellowed from the catwalk leading to the main theater, "Okay people, get moving. The session is going to start."

Such casual displays of camaraderie permeated the 43rd division conference held this month in Valdez, Alaska. Arriving in Valdez with the last of the silver salmon were nearly 200 scientists from Alaska, Canada, Russia, and "the lower 48."



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Valdez, Alaska: Site of the 1992 AAAS Arctic Division Meeting.

"The conference is the main activity of the division," says Weller. Once an informal workshop where researchers would gather to share the results of their summer fieldwork, the annual meeting now draws the attendance of about half of the division members.

As for the location, why hold a meeting in a city that was buried by a volcanic eruption in 1912, leveled by an earthquake and a tsunami in 1964, and had over 10 million gallons of Alaskan crude spilled into its waters in 1989? After bearing the brunt of environmental misfortune, Valdez was perhaps the most appropriate site in the Arctic to address the conference topic: "Environmental Change: Natural and Man-Made."

"The theme is especially appropriate for polar regions where the projected global warming will have significant climatic repercussions," says Ken Dean, 1992 division president and conference chairman. "This conference provides an opportunity for arctic and antarctic scientists to exchange information about their current activities and, perhaps, to solve some perplexing problems on the issue of environmental change."

The resounding theme emerging from the discussions of environmental change seemed to be the interrelatedness of all things. "Everything is connected to everything else," said William Kellogg, former president of the American Meteorological Society. Nearly 90 speakers examined the involvement of a host of factors in modulating the arctic climate, including:

- atmospheric levels of CO_2 and methane
- thickness and extent of polar ice and glacier retreat
- permafrost melting
- ocean circulation
- cloud cover, precipitation, and the reflection of sunlight
- solar flares and other events
- and vegetation.

These components interact with one another to form a complex feedback system that effects not only the climate, but the social and economic environments of the native arctic communities.

"Global climate change is nothing new," says Weller. "We are certain the greenhouse effect is real, and that human activity enhances that effect." Climatological measurements for the arctic area over the past 30 years show temperature increases, particularly over the land mass of North America during the winter months. Although Weller emphasizes that global warming is something to be taken seriously, he admits that there are uncertainties arising from the variability inherent in the system.

To further complicate matters, temperature records are often missing data, or contain readings that may not be entirely accurate, says Sue Ann Bowling, a climatologist at the University of Alaska, Fairbanks. "Very few temperature recording stations have stayed in the same place for a significant length of time," says Bowling. This may hamper the ability to correctly interpret temperature trends. For those stations that have remained in place, the surroundings may have changed, for example, a rural area could be replaced by a city, causing an apparent rise in night-time temperatures. Bowling is working toward cleaning up the Alaskan records, but until then she says, "We've got to do the best we can with available records to detect global warming."

Despite the natural variability in temperature, Bowling predicts that "probably within the next 10 years we'll see the temperature increase edge above the noise." At present, we are harvesting predictions from the third generation of models of climatic change. Most investigators agree that the models have shortcomings. Although the models disagree on the magnitude of the global temperature increase, Bowling says, "none predict *no* changes."

Given the lack of scientific certainty on the question of global warming, how should policy makers act in a responsible fashion? "Environmentalists want to be 99% sure that we won't harm the environment, and business interests insist on a 99% likelihood that a situation will be lethal before they act," says Bowling. "It seems to me that when we're dealing with something that will drastically alter the ability of the climate to support human life, we should settle for a 50% probability instead of insisting on absolute proof one way or the other."

Given the location and topic of the conference, a good deal of attention was focused on the *Exxon Valdez* oil spill. In addition to providing preliminary assessments on the effect of the oil on local ecology and communities, participants reviewed improved contingency plans to limit the potential damage from possible future spills. Historian Nancy Yaw Davis sees natural disasters as "opportunities to develop new and better responses." After the spill, says Davis, "the convergence of ideas was thicker than the oil ever was."

Weaving through the various sessions was a consensus on the necessity for policy-makers and the general public to understand science methodology in order to make rational decisions concerning volatile issues like global warming. "The need for an informed, confident citizenry to ensure that democracy works is becoming ever more important," said Leon Lederman, chairman of the board of AAAS, in his plenary address. "We need to communicate the values and benefits of science to the general public." Lederman emphasized telling people what science can and cannot do, and teaching people how to recognize the proper use of scientific reasoning.

Part of the solution lies in making science and scientists more approachable to the public. While Lederman would go as far as "telling science stories on cereal boxes" in order to make science more palatable, division president Ken Dean adopted a more personal approach. He participated in Karaoke night at the Pipeline Club to demonstrate that geologists are people too. Could anything make a scientist appear less intimidating than hearing him sing "Earth Angel?"

AAAS Regional Division Meetings

In addition to the Arctic Division, AAAS has three other geographic divisions catering to members in the Pacific, Caribbean, and Southwestern and Rocky Mountain (SWARM) regions.

The schedule for upcoming regional division meetings is:

Arctic: September 1993
Whitehorse, Canada
Contact: Gunter Weller
907-474-7371

Caribbean: 20 November 1992
San Juan, Puerto Rico
Contact: Sergio Silva
809-854-2700

Pacific: 20 to 24 June 1993
Univ. of Montana, Missoula
Contact: Alan Leviton
415-752-1554

SWARM: 23 to 26 May 1993
University of New Mexico
Albuquerque, New Mexico
Contact: M. Michelle Balcomb
303-945-5516

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International Cooperation in the Arctic

"Science belongs to all of the people," says Gurii Marchuk, former president of the Soviet Academy of Sciences. Marchuk commented on the growing trend toward international cooperation during his plenary lecture at the 1992 AAAS Arctic Division meeting.

Issues critical to the survival of the arctic region, including preserving biological and cultural diversity, are not only of concern to the United States.

"International problems demand international solutions," says State Department Arctic representative Elizabeth Leighton. She organized a meeting in August on "The Changing Role of the U.S. in the Circumpolar North" to review U.S. arctic policy. Leighton says the conference focused on casting aside the cold war view of the region in favor of cooperating with other arctic nations on economic and environmental concerns.

While international policy clearly effects the environment, Leighton also sees the reverse. "I believe that environmental changes are the motivating factor behind circumpolar cooperation today," she says, "and political changes in the former Soviet Union allowed this cooperation to take place."

As a reflection of the growing cooperation between the countries in the arctic region, the 1993 Arctic Division meeting will take place in Whitehorse, in the Canadian Yukon.

Further, the Arctic and Pacific divisions are currently working toward co-organizing a meeting with the Far East branch of the Russian Academy of Science, to take place in Siberia in 1994.

A committee consisting of Arctic science specialists and representatives from the AAAS Arctic and Pacific divisions and the national headquarters met for the first time during the Arctic Division meeting to develop proposals for a possible conference theme. International Programs director Richard Getzinger and associate program director Sandra Burns shared these proposals with the chairman of the Russian Academy of Science Far Eastern branch, George Elyakov, who, according to Getzinger, "reacted quite favorably to the idea of holding such a conference."

"One valuable result of the meeting will be establishing contacts that will grow into future collaborations," says Getzinger. "Scientists who don't know each other will meet and find they have a lot in common, even though they've been working on two continents that until recently have been isolated from one another for political reasons."

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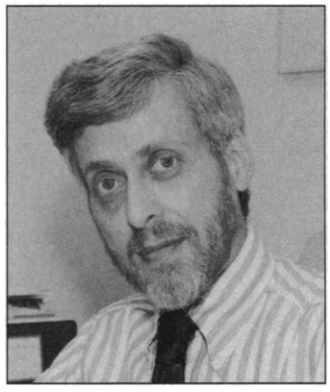
Scientific Collaboration with Eastern Europe and Russia

Over the past several years we have witnessed the disintegration of communism in Eastern Europe and the former Soviet Union. The resulting political, social, and economic implications have far-reaching implications for the work of scientists and the issues of freedom and responsibility they face.



AAAS's Mark Frankel: "Science is an international enterprise."

To encourage collaboration among scientists in the United States, Eastern Europe, and Russia, AAAS Science and Policy staff Jane Cave and Mark Frankel met with over 100 researchers, educators, and administrators in Czechoslovakia, Hungary, Poland, and Russia in the fall of 1991 to discuss these issues. Their concerns and recommendations are presented along with plans for future directions in *Breaking From The Past: Setting New Ground Rules for Scientific Freedom and Responsibility in Eastern Europe and the Russian Federation.*

Says Frankel, "Now that the old political obstacles to East-West contacts have collapsed, there are new possibilities for dialogue and cooperation."

"The transition ... is also bringing a host of new problems that have to be addressed at a practical level," says Cave.

To address the issues facing these burgeoning democratic scientific communities, the authors recommend organizing a series of five workshops. The first meeting, tentatively scheduled to take place in Warsaw in June 1993, will examine peer review. The scientists who spoke with Cave and Frankel agreed that adopting a peer-review system for assessing funding applications would be an important step toward creating an autonomous, self-regulating science and technology sector.

Frankel and Cave found the Eastern European scientists eager to engage in dialogue with the West. The Eastern scientists clearly do not wish merely to mimic Western-style scientific organizations, but hope to learn from both the successes and pitfalls experienced by the West.

For more information, or to obtain a copy of *Breaking From The Past*, contact Jane Cave or Mark Frankel, Scientific Freedom, Responsibility, and Law Program, at 202-326-6600.

Next month, "Inside AAAS" will feature programs sponsored by the International directorate to promote scientific cooperation between the U.S., Russia, and Eastern European nations.

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Role Models Encourage Hispanic Students

When children are constantly bombarded with images of rock stars and sports heroes, how can we encourage them to pursue careers in science or engineering?

Proyecto Futuro staff Estrella Triana, Anne Abbruzzese, and Marsha Lakes Matyas assembled a book that features the biographies of 14 Hispanic scientists and engineers. "We know role models are important," says Triana. "If children are not exposed to anyone that is like them, they don't believe that they can pursue these careers."

Stepping into the Future: Hispanics in Science and Engineering exposes middle school children to successful scientists that span the disciplines from the first Hispanic astronauts to the current Surgeon General. All the scientists featured, whether young or old, male or female, encourage students to get a good education, work hard, and pursue their dreams.

In addition to the profiles, presented in both English and Spanish,

the book provides teachers with contact information for scientific organizations throughout the country, and offers advice for scientists interested in visiting schools and speaking to the students about their careers.

This valuable classroom tool was produced in conjunction with Proyecto Futuro, a AAAS program whose goals include improving science and mathematics education for Chicago students in grades K through 8, with special attention to reaching Hispanic students.

To order a copy of this publication, contact AAAS Books at 301-645-5643 and ask for AAAS.

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Nominations for Mentor Award

Each year AAAS recognizes individuals who attempt to increase the participation of women, minorities, and persons with disabilities in science and engineering. Outstanding mentors will be given the $5000 Mentor Award at the 1993 annual meeting in recognition of their accomplishments.

If you wish to nominate an individual who has mentored underrepresented students or significantly contributed to increasing the ethnic diversity of students pursuing and completing doctoral studies, please send the following materials to Yolanda George or Alana Wilson by 28 October 1992:

Letter of nomination
Mentor's *curriculum vitae*
List of students mentored
Five to 15 letters of support from students or colleagues.

Address submissions to AAAS Mentor Awards, 1333 H Street, NW, Washington, DC, 20005.

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Human Genome Conference

This October, AAAS, the Human Genome Organisation and *Science* will sponsor *Human Genome '92*—the fourth annual conference reviewing the progress in the Human Genome Project. This international conference will take place from 14 to 17 October in Nice, France.

Topics scheduled for discussion include mapping techniques, human genetic diversity, progress in model organisms, and how the genetic information resulting from the Human Genome Project can be applied to detection and treatment of disease.

For more information, contact the Meetings Office at 202-326-6450.

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AAAS Rep to India

AAAS has been invited to send a representative to the 80th Annual Session of the Indian Science Congress Association (ISCA) in Goa, India. About 4000 participants representing a variety of scientific disciplines are expected to attend the meeting during the first week of January. The theme of the 1993 session will be "Science and the Quality of Life," and speakers will address how science can help solve problems of social significance.

While no funds are available to defray travel costs, ISCA has offered to cover local expenses. If you plan to be in this region, or would like to recommend a colleague on sabbatical who might be able to attend, please submit a letter of application and a *curriculum vitae* by 31 October to Beth Boswell, AAAS Directorate for International Programs, 1333 H Street, NW, Washington, DC, 20005; 202-326-6650; FAX 202-289-4958.

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AAAS Elections

Ballots for the election of AAAS president-elect, members of the Board of Directors and Committee on Nominations, and section officers are in the mail. All active AAAS members (as of the 11 September issue of *Science*) should receive a ballot. Members enrolled in a second or third section will receive separately mailed ballots for each section.

Please vote promptly; ballots postmarked after 13 November will not be counted. If you do not receive a ballot, or if you get an incorrect ballot, please write to Linda McDaniel, AAAS Executive Office, 1333 H Street, NW, Washington, DC, 20005.

Members may also nominate candidates (including themselves) for president-elect and the Board for election in the fall of 1993 (for terms beginning in February 1994). See the 26 June issue of *Science* for a list of this year's candidates, and the contents pages of any recent issue of *Science* for current Board members. Nominations, with candidates' *curriculum vitae*, should be sent no later than 2 November to Gretchen Seiler, AAAS Executive Office, 1333 H Street, NW, Washington, DC, 20005.

The Beauty of Quasicrystals

His palette is a computer keyboard. He sculpts in stainless steel, colored plastic, and four dimensions. Tony Robbin says his art "searches for a new definition of the space of objective reality." His work on quasicrystal geometry will be exhibited in the first floor atrium of AAAS headquarters from 13 October 1992 to 15 January 1993.

In his recent book *Fourfield: Computers, Art and the 4th Dimension*, Robbin says, "physics and mathematics describe spaces far richer than any artist has yet imagined." Inspired by vivid computer graphics, Robbin uses non-repeating patterns to represent what he calls the "spaces needed for the definition of inner experience."

His quasicrystal sculptures, whose chameleonlike geometry alters with changing light and perspective, join the ranks of exhibitions sponsored by the AAAS Art of Science and Technology Program.

Quasicrystal Dome, 1989, stainless steel, aluminum, and plexiglass.

Since 1985, this program has presented exhibits that reflect the interactions between science and art. Program director Virginia Stern predicts, "It's going to be spectacular."

Although Robbin has participated in over 70 shows in the United States and abroad, this will be his first exhibit in Washington, D.C.

The opening reception will take place on 13 October, from 4:30 to 6:30 p.m. at the AAAS headquarters, 1333 H Street, NW. For more information about the exhibit, or the AAAS Art of Science and Technology Program, contact Virginia Stern at 202-326-6672.