Physicists Pursue Dialogue on Security and Arms Control on Indian Subcontinent

It didn't take long for the world to absorb the fact that India and Pakistan, with their nuclear tests last May, had bumped up the number of declared nuclear weapons states from five to seven. Even on the subcontinent, news of the nuclear race has been largely displaced by more pressing concerns: the rising cost of onions, the Indo-Pak Test cricket matches.

Within the physics community, however, or at least a part of it, attention remains focused on the political fallout from last May. Over the last ten months, small but noteworthy efforts have been made to open up a dialogue on arms control and security in India and Pakistan. Meanwhile, US sanctions imposed after the tests continue to stall shipments of scientific equipment to the subcontinent and disrupt travel by scientists between the US and India. Though the latest round of US–India bilateral talks on nuclear nonproliferation, which concluded in New Delhi on 31 January, seemed encouraging, as PHYSICS TODAY goes to press, the sanctions affecting scientific exchange are still in place.

Asian dialogues

The discussions that physicists have been pursuing range from open public debates to private, off-the-record workshops, some formal and organized, others informal and spontaneous.

Last December, for example, during the Tenth General Meeting of the Third World Academy of Sciences in Trieste, Italy, scientists from six Asian countries were drawn into an *ad hoc* discussion on arms control and security. The gathering, organized by Jeeva Anandan of the University of South Carolina and Saeed Durrani of the University of Birmingham (in the UK), was intended as a forum where "scientists could speak their minds as scientists, and not as representatives of their governments," says Anandan. The wide-ranging discussion led to the adoption of three resolutions: (1) All countries must agree to "no first strike" use of nuclear weapons; (2) free exchange of scientists throughout Asia must be promoted; and (3) all countries must strive to reduce both conventional and nuclear arsenals.

Although the resolutions carry no real weight, Anandan hopes they will form the basis for a second "Asian dialogue," to be held on 23 March during the centennial meeting of the American Physical Society (APS). Anandan would like to see a "grassroots movement" develop among scientists, aimed at "reducing tensions between different countries of Asia [and] enhancing public awareness of dangers posed by a nuclear arms race in the region." Adds Durrani, "We're taking as our model Brazil and Argentina"—where, in the 1980s, members of the Asociación Física Argentina and the Sociedade Brasileira de Física proved instrumental in convincing their governments to abandon nuclear weapons research—"and Pugwash."

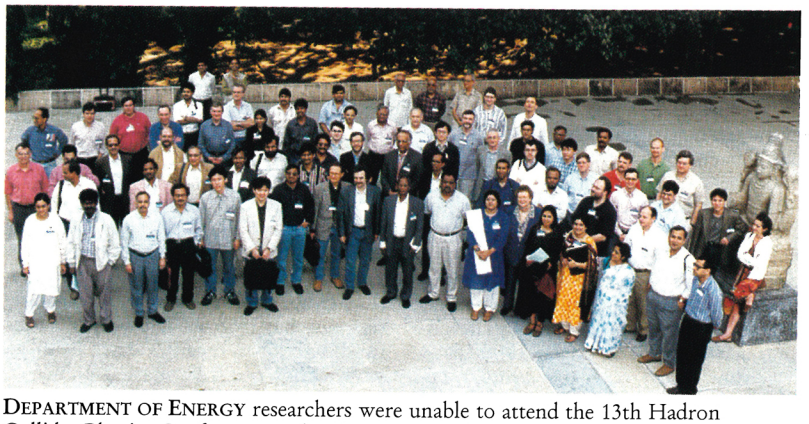
US sanctions on travel and equipment exports remain a concern for scientists.

In fact, Pugwash International plans to hold an arms control workshop in New Delhi this month. Through such international conferences and workshops over the last four decades, Pugwash is regarded as having had some success in achieving its goal of a nuclear-weapons–free world. Even so, says George Rathjens, secretary general of Pugwash, fostering a dialogue on India and Pakistan has been fraught. Immediately after the nuclear tests, for example, Pugwash tried to develop a consensus statement on the matter. Given members' divergent opinions, he says, "this proved to be virtually impossible." It wasn't until October that the organization issued its statement, which spreads the blame evenly among India, Pakistan and the established nuclear powers.

"Scientists have the enormous benefit of being an international community, where people talk the same language and have basic values in common," Rathjens says. "That gives us the basis for talking about other issues . . . and a special responsibility."

Like Pugwash, the National Academy of Sciences' Committee on International Security and Arms Control (CISAC) has also pursued discussions with its counterparts in Russia, China and elsewhere. Several months before the tests, CISAC members visited India for some preliminary talks, and the first official delegation will go there in May. CISAC discussions are, by design, private and off-the-record. As committee member Wolfgang Panofsky explains, "We believe that that modality is the best way to permit unfettered and free discussion. It's a way of introducing new ideas into the agenda of each side." Panofsky notes that while scientists have played a constructive role in promoting arms control, "it was scientists, largely physicists, who maintained India's readiness to test nuclear weapons from its first nuclear test in 1974 until the 1998 events."

Although CISAC has not scheduled talks in Pakistan, there, too, people have managed to open up some space for discussing nuclear issues. Over the last few months, Quaid-e-Azam Uni-



DEPARTMENT OF ENERGY researchers were unable to attend the 13th Hadron Collider Physics Conference at the Tata Institute for Fundamental Research in Mumbai, because of US sanctions on scientific exchanges with TIFR and 200 other Indian and Pakistani institutions.

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versity physicist Pervez Hoodbhoy has arranged public meetings in several Pakistani cities, to highlight the inherent dangers of a nuclear race. One gathering in January featured several prominent legislators, including Colonel Ghulam Sarwar Cheema, chairman of the parliament's defense committee, and Senator Shafqat Mahmood, of the committee on Kashmir (where a bloody border dispute between India and Pakistan continues). "People expressed their fear of an accidental nuclear war and the militarization of Pakistani society," Hoodbhoy reports. Afterward, he says, the officials admitted that the discussions "got them to think a little more about the dangers of nuclear racing with India [and] the problems of a safe nuclear command and control system."

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At press time, the Pakistan Peace Coalition was gearing up for a two-day conference in Karachi at the end of February. Activists and opinion makers on both sides of the issue, as well as delegates from India and other countries, were expected. According to A. H. Nayyar, a colleague of Hoodbhoy's at Quaid-e-Azam, the meeting will be the first of its kind in Pakistan. Public enthusiasm over nuclear weapons may have waned, he adds, but "if India conducts another test, of which the chances are definitely greater than zero, the public here will again be happy if Pakistan does the same."

First steps

Nobody is claiming that such steps will, in themselves, undo what's been done. But it's a start. "With a few notable exceptions, scientists in India and Pakistan have never taken an active part in analyzing nuclear policy," says M. V. Ramana of Princeton University's Center for Energy and Environmental Studies. "Now they're beginning to play a role. For the first time, we're seeing a much broader democratic participation, in at least analyzing the decisions, if not the decision-making itself. In the long term, hopefully, this is going to help reduce dangers there."

Openly critizing the tests does carry risks. Last summer, for example, T. Jayaraman, a theoretical physicist who has written newspaper and magazine articles critical of the 1998 tests, was threatened with disciplinary action by his employer, the Institute of Mathematical Sciences in Chennai (formerly Madras). An intensive letter and e-mail campaign garnered over 400 signatures from scientists worldwide, prompting IMSc director R. Ramachandran to back down. In a letter to Jayaraman, however, he noted that "similar recurrent action by you will force me to take such punitive action as deemed necessary." Jayaraman, though, has continued his efforts; in March, he will speak at a workshop on "the role of the international physics community in arms control" at the APS centennial.

Sanctions hodgepodge

Meanwhile, the US sanctions imposed under the so-called Glenn Amendment continue to hamper scientific exchange, mainly between the US and India. Since last summer several of the Indian participants in Fermilab's DZero detector collaboration have been barred from working at the lab (see PHYSICS TODAY, September 1998, page 49). The researchers hail from the Tata Institute for Fundamental Research (TIFR) in Mumbai (formerly Bombay), one of 200 Indian and Pakistani institutions with which collaborations have been suspended. Some students from those institutions have also been denied visas to attend graduate school in the US.

More recently, eight US scientists working at Department of Energy (DOE) labs learned that the agency had turned down their travel requests for the 13th Topical Conference on Hadron Collider Physics, held at TIFR in mid-January; 23 university researchers, on the other hand, were not affected. (One Fermilab physicist also attended, using his own money.)

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Restrictions on the travel of US scientists by the US government "is kind of unprecedented," says Irving Lerch, APS's director of international affairs. "Even during the height of the cold war, American scientists went to Russia and China."

For two months leading up to the meeting at TIFR, Fermilab director John Peoples, DZero members and others lobbied DOE; they were told that while DOE was sympathetic, the Department of State was not. Lerch notes that State's in-house scientific expertise has suffered as a result of hefty funding cuts in recent years. Still, he says, "They could be more helpful."

Probir Roy, head of TIFR's theoretical physics department, points out that although his institution, which has already spent $500 000 toward the DZero upgrade, is funded by India's Department of Atomic Energy, "it is an open academic institute . . . without any classified research whatsoever."

Immediately after the hadron physics meeting, a letter signed by 25 of the non-Indian participants was sent to DOE Secretary Bill Richardson, expressing their "strong disappointment and regret" at their colleagues' absence and urging that "restrictions on US–Indian scientific collaborations by the US Government be removed."

Exactly which activities are sanctionable continues to evolve. In early November, President Clinton waived most of the sanctions, noting that both India and Pakistan had made "progress," by declaring moratoria on further tests; showing willingness to sign the Comprehensive Test Ban Treaty and halt production of fissile material; and agreeing to tighten control of exports. (However, India and Pakistan have not agreed to cease development and deployment of nuclear weapons—a fourth condition for removing the sanctions.) But six days later, the US Department of Commerce issued a list of over 300 Indian and Pakistani agencies and companies linked to nuclear and missile projects; Commerce now requires individual licenses for exports to the listed parties. The result, as one confused observer put it, is a "sanctions hodgepodge."

All US government agencies must comply with the sanctions. And so at NASA, for example, a handful of requests involving travel to India have been turned down, and "no new requests by Indian nationals to visit NASA facilities have been accepted," says spokeswoman Debra Rahn. And if you're thinking about filing for an export license to one of the blacklisted institutions, she adds, "you have to presume it will be denied."

MIT's Jerome Friedman, the current president of APS, remains hopeful that the "quiet negotiations" APS has been pursuing with government officials will bring about a removal of at least those sanctions that apply to basic research. "We certainly don't want to contest US law," says Friedman. "But on the other hand, we want to see it applied in a reasonable fashion."

APS is monitoring closely the attendance rolls for the 23rd General Assembly of the International Union of Pure and Applied Physics, to be held this month in Atlanta. Should participants from India or Pakistan (or any other country, for that matter) encounter difficulties in getting US visas, it could result in the US being barred from hosting future IUPAP meetings. **JEAN KUMAGAI**