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ly neutral, economically prosperous nations of Switzerland and Austria are favored locales.

U.S. enforcement authorities acknowledge that diversions pose an unceasing challenge. As many of these cases go undiscovered until the exports are completed, the best the authorities can do is investigate and prosecute, closing for a while a successful transfer route. At best, these efforts only slow the drain of Western economic and strategic advantage. As long as Western firms prove willing to trade with obscure and shadowy figures in other nations, however, the spill of Western competitive advantage will continue.—R. JEFFREY SMITH

AAAS in Canada Seeks Peace Without Hawks

Beam weapons, creationism, human rights, and the role of the media were among the topics of the Toronto meeting

Toronto. Two downtown hotels, separated by a battleground of banks attempting to outvie one another in architectural flamboyance, were the site of the AAAS's annual meeting held on 3 to 8 January this year. A cold snap, which brought Toronto its lowest temperatures on record since 1859, kept visitors confined to the underground shopping malls for much of the time, or left them to stare at the Sheraton's heated outdoor waterfall, which protested the biting cold with clouds of vapor.

Arms control was a major theme of the AAAS convention, a topic also of concern to the association's Canadian hosts: Prime Minister Trudeau—away on a skiing trip in Austria when the meeting began—has proposed an important four-point disarmament plan to the United Nations. But Trudeau's Minister of Science and Technology, who doubles as Minister for the Environment, appeared at the meeting to plead for stronger action in the United States against the problems of acid rain. Despite the enthusiasm in Ottawa, neither topic at present enjoys high political fashion in Washington.

The keynote lecture to the AAAS meeting was given by Canadian literary critic Northrop Frye, who politely explained why science is not the stuff of poetry. In the 18th century, people tried to make it so:

> Let curious minds, who would the air inspect,
> On its elastic energy reflect—

was one such result. Another poem of the period, in honor of Jenner's discovery of vaccination, began "Inoculation, Heavenly Maid, descend!" "This does not seem to be the kind of thing poetry can do," remarked Frye. The poet and scientist, he suggested, "may use, up to a point, the same language, or even treat the same themes, but the structure of poetry and the structure of science remain two things."

On Sunday, the following day, began the first of eight symposia on arms control. The MX missile was described by Herbert Scoville, president of the Arms Control Association, as a "disaster for our security, our economy and the environment." IBM physicist Richard Garwin, in whose hands lucidity is a deadly weapon, continued to demolish the MX's remaining pretensions to being a serious armament, then turned his fire upon the Pentagon's newest toys, the laser and charged particle beams. All that survived the carnage was the offshore submarine force proposed by Garwin and Sidney Drell as a cheaper and less vulnerable substitute for the MX system.

Garwin gained everyone's attention by replying to a question that, in his view, "There is a 50:50 chance of nuclear war by the year 2000" and that it was "highly likely" that just a few nuclear weapons would be fired by that date.

The sessions on arms control were of high enough quality and yet, as the umpteenth dove wrung his hands, the thought occurred that the audience might have been better entertained, even more fully edified, if an occasional hawk had been around to voice a discordant note. Meeting arranger Arthur Herschman says he mentioned this point to the organizer of the eight sessions, who replied that he " 'could not find a hawk.' "

At a press conference held by officers of the AAAS, incoming president Allan Bromley of Yale said he was "very optimistic about the future of R & D under the new Administration."

Paul Warnke, on the other hand, was "deeply troubled" about the interruption of the SALT process. Warnke, former chief SALT negotiator for the United States, is a compelling public speaker who combines a lawyer's precision in use of words with a passionate commitment to the feasibility of negotiation. "It would be a mistake to suppose that the security of the United States can be improved by reducing the security of the Soviet Union," he warned in a lecture full of aphorisms: "We don't have to like them, but we know we have to live with them. The bottom line is no existence or coexistence." Every new Administration, he noted, says that it is going to get really tough with the Russians, but Warnke thought little of the reemerging idea that the Soviets can be outspent in military preparedness: "This prescription will mean a long wait, a massive bill, and far less security than we have today," he said in the lapidary phrases of one who has distilled an issue to its quintessence.

Sunday afternoon brought a retreat from the problems of the present into a scarcely fathomable mystery of the not so distant past: the reception accorded by geologists in Europe and the United States to Wegener's theory of continental drift. Any child can see, from a glance at the globe, that the hump of South America fits snugly against the armpit of Africa, yet it took geologists almost 40 years, from 1922 to about 1960, to accept that the continents are in motion, and they did so only when the discovery of the symmetric pattern of seafloor magnetic anomalies had made the conclusion all but inescapable. "In England, as well as in North America, we really have to search the realm of the psychology of science, rather than that of geophysics, to get the answer," suggested Ursula Marvin of the Astrophysical Observatory in Cambridge, Massachusetts. "We excuse people for not accepting drift because they didn't have a mechanism, but they had that in 1928," she remarked in reference to the widely noted paper by geologist Arthur Holmes in which he correctly advocated convection currents as the force that moves the continents.

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Wisconsin geophysicist Robert Dott recalled that he didn't even hear of Wegener's theory until he was a graduate student, in 1950. Among the factors for American geologists' attitudes toward Wegener, Dott surmised, was "the curse bestowed on drift by the great high priests of geophysics, especially Harold Jeffreys, but also Maurice Ewing." Nor did the climate of the times help: "In retrospect," Dott said, "the 30's and 40's [in geology] were ultraconservative and reactionary. Also there was an over-preoccupation with description and classification."

The convening that evening of the Moscow Sunday seminar in exile brought a sharp return to the present. The seminar, the fourth of its kind to be held outside Russia since the seminars were closed down by the Soviet authorities, was intended to draw attention to the arrest of Viktor Brailovsky, a leader of the group, and to the plight of the remaining refuseniks. When a Russian Jew applies for an exit visa to Israel, explained University of Toronto physicist Norman Salansky, he at once loses his job, his children may be refused admission to university, and his parents can lose their pensions. The scientific seminars "were the only substitute for the refuseniks' previous lives," he said. Salansky, who was interrogated for 6 months by the Soviet authorities before being allowed to leave, was as a child the sole male survivor of the ghetto at Kovna, Lithuania, after the Nazi holocaust.

After supper, delegates heard Canadian Minister for the Environment John Roberts describe as a "rain of death" the 12 million tons of chemicals deposited each year on the forests and lakes of eastern Canada. Half of the lethal precipitation is visited upon Canada, he alleged, by the United States, and he asked his guests to persuade their government to take preventive action.

Meanwhile in Austria, Roberts' prime minister, Pierre Trudeau, found himself stranded in the skiing resort village of Lech, and had to cancel an official meeting with Austrian Chancellor Kreisky. This was to have been the first of a series of meetings with six foreign leaders to prepare for an international economic conference in July.

On Monday, the third day of the meeting, the arms control sessions continued. Communications expert George Gerbner, of the University of Pennsylvania, contended that the public's image of science is shaped not by the science programs on TV, which relatively few people watch, but by general entertainment programming. The scientist, as portrayed in TV drama, tends to be very smart but less warm, peaceful, or sociable than other professionals, reports Gerbner. Still stranded in Lech, Trudeau again had to postpone his summit meeting with Chancellor Kreisky.

On Tuesday, the fourth day, the sessions on arms control continued. A workshop on the human rights of scientists in Latin America announced its recommendation that scientific societies in both North and South America should set up groups charged with responding promptly to violations of the rights of their fellow scientists. The workshop, organized by AAAS human rights coordinator Eric Stover, brought to Toronto some 20 leading scientists from Latin America, including José Goldemberg, president of the AAAS's Brazilian counterpart.

Creationism is the movement by fundamentalist Christians in the United States to make biology textbooks reflect their view of how life on earth started. The movement has suffered many defeats, but gained enough victories to thoroughly alarm science teachers. Moreover, it has been supported by Ronald Reagan from the time he was governor of California to a recent endorsement during his presidential campaign. The session on creationism was disappointing for the simple reason that no creationists had been invited. The evolutionists explained again, without threat of contradiction, why the creationists were wrong and misguided. But perhaps the creationists had the last word. In the classified section of that day's Toronto Globe and Mail, between notices proclaiming "Young man seeks companion, serious inquiries only," and "Grandma Lou Tickins—Congratulations on your first grandson," appeared a complaint that the AAAS meeting was a "closed shop, only including scientists who cling to the discredited theory of Evolution and also the idea that the Universe is billions of years old. . . ."

Creationists and science writers condemned.

Pierre Trudeau continued to be snowed in at Lech, canceling yet another meeting with Kreisky and missing a state dinner arranged for him in Algiers, the second capital of his tour.

On Wednesday the sessions on arms control continued. Trudeau was informed by the Algerians that they would see him if he could reach an airbase in Lahr, Germany, by 3 p.m. that day. He managed to do so in the nick of time, only to learn that the Algerians had changed their minds and sent word to come another time.

On Thursday, the final day, Jesse Jackson, director of Operation Push, failed to show for a symposium on science education. In a session on science and the media, science journalists were offered sweeping suggestions for improvement by various critics. Fred Jerome, of the Scientists Institute for Public Information in New York, suggested that "Most of the major technological problems which confront our country are generally ignored by the science media." The new science magazines and TV programs purvey only news about breakthroughs, leaving "a dearth of discussion of what are the real issues facing us today," Jerome complained.

According to journalism professor Rae Goodell of MIT, the symbiotic relationship which often exists between reporters and those they write about is particularly pernicious in science journalism. "Veteran science writers . . . tend to share the scientist's enthusiasm for the process, values and discoveries of science and to be less interested in conveying the political aspects of science . . . [lest] political stories tarnish the image of science." When the science press does cover controversial issues in science and technology, it has often been distinguished for "its passivity, its superficiality, its lack of initiative, the tendency to use what is readily available from established scientific sources without further investigation." No science writer was invited to speak in response to these stimulating strictures for self-betterment.

The Toronto meeting drew some 3250 paid registrations, slightly less than predicted. Some lectures, such as those given by Frye, Freeman Dyson, and Philip Morrison, were heard by close to 2000 people. One possible omission, highlighted during the meeting by the report from Switzerland of three cloned mice, was the absence of any session devoted to genetic engineering and its practical and other consequences.

Meanwhile Prime Minister Trudeau, having been denied his meetings with the leaders of Austria and Algeria, arrived in Lagos. But for reasons that were not immediately explained, his first meeting with the President of Nigeria was canceled by the Nigerian side.

—NICHOLAS WADE