reached alarming levels in some urban areas of central Africa but has not yet spread much in southern Africa.

- In a paper scheduled for presentation by Françoise Brun-Vézinet of the Hôpital Claude Bernard in Paris, which was canceled at the last moment, 7 percent of serum samples collected from prostitutes in Kenya in 1980 contained antibodies to the AIDS virus; by 1984, the proportion had risen to 51 percent. Their male customers also showed an increase in infection. Only 1 percent of a sample of men attending a clinic for sexually transmitted diseases had antibodies to the virus in 1980; by 1984, the proportion had risen to 13 percent.
- A study of prostitutes in Butare, Rwanda, indicated that 29 of 33 tested in 1984 had antibodies to the virus, and 27 were showing symptoms of generalized lymphadenopathy. Seven out of 25 men treated for sexually transmitted diseases who admitted contact with prostitutes also tested positive. In comparison, 12 percent of female controls and 17 percent of male controls showed signs of infection. According to Philippe Van de Perre, of the Hôpital Saint Pierre, who presented the data, there was a high correlation between a history of infection by sexually transmitted agents and infection with the AIDS virus. Van de Perre and others found no correlation, however, with therapeutic injections, indicating that use of dirty needles may not currently be playing a major role in transmission of the disease. (A possible exception may be injections at clinics for sexually transmitted diseases.)
- A second study in Rwanda indicated that 10.5 percent of a sample of 258 blood donations contained antibodies to the AIDS virus. The rate of infection appears to be higher in urban than in rural areas; 17.5 percent of a sample of young adults living in Kigali tested positive, compared with 3 percent of young adults from a rural area.
- Chris Williams of the University of Ibadan, Nigeria, reported that 7 percent of Nigerian blood donations tested positive for AIDS virus antibodies, although he claimed that there is no evidence for the disease itself is present in Nigeria.

Although there was little disagreement about the trends conveyed by these serological studies, there was considerable debate about how much weight should be put on the absolute numbers. One problem is that a relatively high rate of false positives occurs when African sera are tested by some of the commercially available kits. However, some researchers also reported high rates of false negatives. For example, Zagury said he isolated virus from 12 patients from Zaire who were producing no detectable antibodies, out of 84 tested.

Although the epidemiological picture is somewhat hazy, spread of the virus and the disease through heterosexual contact is clearly indicated. Even the statement by the African representatives acknowledged that "heterosexual promiscuity with multiple sexual partners is one of the high risk factors for AIDS and therefore the public should be informed." Many researchers believe the same message should be conveyed in the West.—**COLIN NORMAN**

Summit Ends with Exchange Agreements

A handful of scientific and cultural pacts substitute for progress on arms control in the superpowers' joint statement

After a tough meeting with Mikhail Gorbachev shortly before the opening of the Geneva summit on 18 November, Secretary of State George Shultz predicted that the prospect of an agreement on arms control was extremely small. One reason, he told President Reagan, is that Gorbachev has clearly settled views about the topics at issue. "Well, we're very set on ours," was Reagan's reply, as he later confided to a group of foreign journalists.

Not surprisingly, about all that ultimately transpired at the summit was an exchange of the official U.S. and Soviet arms control positions, as well as the conclusion of a handful of agreements on scientific, academic, and cultural exchanges. Overall, the talks were described by Reagan as "constructive" and "worthwhile" and by Gorbachev as "very frank . . . very lively . . . [and] to a certain extent productive." The major achievement was an agreement to hold two additional summits, one in each country over the next 2 years, as well as more frequent meetings between senior government officials.

With regard to weapons, neither side backed off on the principal issue that divides them, the "Star Wars" missile shield officially known as the U.S. Strategic Defense Initiative (SDI). Specifically, Reagan emphasized the importance of continuing with a scientific quest for "nonnuclear defensive systems that would only threaten offensive missiles, not people," while Gorbachev reiterated that a reduction of offensive weapons could be negotiated only if "the door to unleashing an arms race in outer space [was] firmly slammed shut."

A vigorous disagreement about the number and type of weapons that should be dismantled was papered over by a joint declaration that "early progress" should be sought "in areas where there is common ground, including the principle of 50 percent reductions in the nuclear arms of the U.S. and the U.S.S.R. appropriately applied." Disagreements remain about whether "arms" are missiles or warheads, and about the categories of arms that should be subjected to limitation.

No agreements were reached about continued compliance with the SALT II treaty signed in 1979, or about the precise meaning of certain provisions of SALT I relating to missile defense research, two issues that have proved highly fractious, both within the NATO alliance and in U.S.–Soviet relations. In addition, Gorbachev specifically rejected an interim U.S. proposal to allow military experts on both sides to visit each other's strategic defense laboratories. The purpose of the proposal, as Reagan explained in an address on 22 November, was to "permit Soviet experts to see firsthand that SDI does not involve offensive weapons," and to enable American scientists "to visit comparable facilities of the Soviet strategic defense program."

At a press conference in Geneva, Gorbachev said the idea was illogical and "unacceptable at this stage." The Soviet Union is indeed "prepared to open our laboratories to any sorts of verification or checks," he said, but only *after* an agreement is reached to "ban the extension of weapons to outer space." His response enabled some officials at Los

Alamos and Livermore, who are wary of such an arrangement and were not consulted before the proposal was made, to breathe a sigh of relief.

Several dozen scientists from the Soviet Union have visited the labs in the past, but none has ever toured the areas devoted to military research. With regard to such sensitive SDI endeavors as the nuclear-pumped x-ray laser program, a senior Livermore official says, "I wouldn't know how to show them anything that would make them feel better without a significant release of classified information." Similarly, an official at Los Alamos declared that while such visits might be fine for SDI contractors in the private sector, "I can't believe that we were meant to be included."

As in several previous U.S.–Soviet summits, a series of agreements on academic, scientific, and cultural issues served to dull the impact of the weapons stalemate. In particular, both sides agreed to:

- begin a new program of academic exchanges in history, culture, and economics;
- create new scholarships for exchange students in natural and social sciences, humanities, and technology;
- promote Russian language studies in the United States and English studies in the Soviet Union;
- expand existing Fulbright exchanges, as well as those associated with the International Research and Exchanges Board;
- begin cooperative development of educational software for microcomputers in elementary and secondary schools;
- encourage international cooperation in fusion energy; and
- renew past cooperation in cancer research.

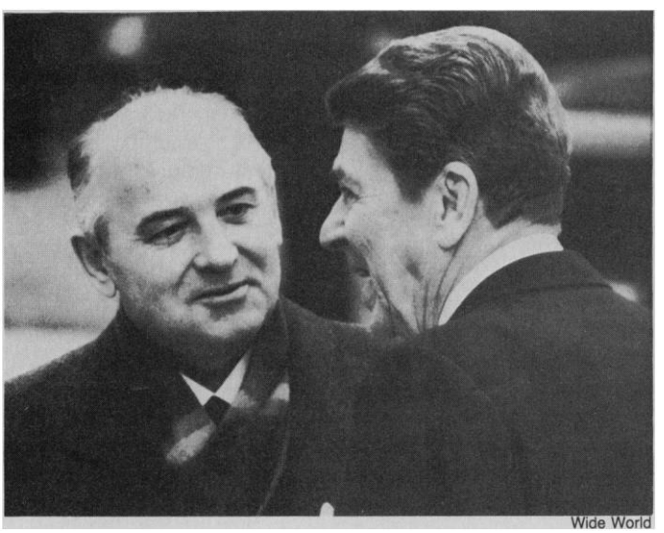
Although some of these items have been under negotiation for more than a year, several—such as the cancer and foreign language initiatives—were apparently added at the last minute in a rushed attempt by both sides to expand the range of topics to be discussed in a joint statement. As of 25 November, officials at some of the relevant government agencies, such as the National Cancer Institute and the Department of Education, knew little about what the programs might involve or how they might be implemented.

Several officials noted that cooperative research in fusion energy was one of the few ideas to be thoroughly discussed in Washington. Suggested on several previous occasions by Yevgeny Velikhov, a fusion scientist who presently serves as vice chairman of the Soviet Academy of Sciences, the idea was greeted with considerable resistance at the Department of Defense, and with little enthusiasm at the White House Office of Science and Technology Policy. Concerns were expressed about both the cost and complexity of the Soviet plan, which called for the construction of a tokamak capable of routinely producing more energy than it consumed. (The overall cost was put at $3.5 billion, requiring annual contributions from the United States of roughly $60 million.) But the primary objection was that sustained cooperation would result in a transfer of technology with significant commercial and military implications. "There were a lot of meetings at which people argued against any scientific exchanges, on the grounds that it was not in the U.S. interest to strengthen the Soviets' position," says one official.

Officials from the Department of Energy retorted that the Soviets, who developed the original tokamak concept, were roughly on a par with the United States in magnetic fusion, and that no military benefits would accrue from the research. In the end, the United States and the Soviet Union agreed only to advocate "the widest practicable development of international cooperation" in fusion research, through a mechanism that remains to be determined. All U.S. contributions will be filtered through existing technology transfer controls.

No progress was made in resuscitating a dormant U.S.–Soviet program on space research, even though Reagan spoke of launching "new joint space ventures" in a nationally televised address on the eve of his departure. According to several U.S. officials, the Administration is now prepared to restart the program, which was suspended in 1982 after the imposition of martial law in Poland, and toward this end Reagan gave Gorbachev a desk set commemorating the 10th anniversary of the Apollo-Soyuz space mission. But the Soviets declined to embark on a new civilian effort out of concern that it might sanctify the ongoing U.S. "Star Wars" effort.

All of this marks a major turnaround in the Reagan Administration's attitude about U.S.–Soviet scientific exchanges. For several years, the programs were seen as a net loss for the United States, and their withdrawal as a means to punish the Soviets for errant behavior. In the wake of the summit, Administration spokesmen were talking about the benefits to be gained from combining resources, comparing information, and gaining access to unique institutions or regions. In addition, one official asserted, "The professional contacts which grow out of scientific exchanges . . . can serve as a mechanism to assert the interest of the American scientific community in the cases of dissident Soviet scientists." Although this view now also prevails at the National Academy of Sciences, it remains controversial within the broader scientific community.



Wide World

President Reagan and General Secretary Gorbachev confer outside the Villa Fleur d'Eau near Geneva on 19 November. Their principal achievement was an agreement to confer again in 1986 and 1987.

To date, there has been no similar turnaround by either side on the more substantive arms control issues. Shortly before the summit began, Secretary of State Shultz indicated that progress would depend "on whether or not the Soviet Union will see the light and see the reasonableness of our positions." Clearly, the Soviet leader did not. In a statement on "Star Wars" immediately after the meeting concluded, Gorbachev stated that "we see that the Americans aren't particularly happy with our way of thinking, but frankly we failed to see their reasoning." And that is where things stand.—**R. JEFFREY SMITH**