

space. Apart from hoping for amino acids, however, the significance of these two new sulfur compounds is that, however complex they be by comparison, they bear out a simple relation between interstellar oxygen and sulfur chemistry: The ratio of the abundance of a given sulfur compound to that of its oxygen analog is equal to $1/42$, which is the cosmic ratio of free sulfur to free oxygen. This seems to apply no matter what the compound. Because of the difference in properties between sulfur and oxygen, chemists would expect subtle variations in the abundance ratio between different pairs of analogs. The simple rule is puzzling. "Isothiocyanic acid hence reinforces the general impression gained from our detection of methyl mercaptan that the interstellar chemistry of sulfur resembles fairly closely that of oxygen..." Linke, Frerking and Thaddeus conclude. "It will be interesting to see whether this qualified conclusion holds for other sources and other molecules." □

Technology swaps with Soviets stop

In retaliation against the recent Soviet "invasion" of Afghanistan by what now appears to be a permanent, core occupation force totaling nearly 100,000 troops, President Jimmy Carter has ordered an immediate halt to all sales of high technology exports to the Soviets and of most cooperative U.S.-Soviet exchanges in science and technology. As of January 9, only continuation of cooperative research projects in the basic sciences appeared immune to the directive announced by Carter in his January 4 nationally televised address.

Eleven bilateral agreements for the cooperative exchange of research, data and personnel in the areas of science and technology are in force. As executive agreements signed by the President, it takes only Carter's word to suspend participation and funding by the U.S. government under them. The 11 include an umbrella agreement spelling out terms of cooperation in science and technology together with 10 thematic agreements covering the areas of health, housing, agriculture, oceans, transportation, environmental protection, energy, nuclear energy, space and artificial-heart research.

The high-level administrative bodies that pilot the policy and direction that programs under any given agreement will take are called joint committees. And by January 7, the Soviets had already been notified that the next three scheduled joint-committee meetings — in the areas of housing, agriculture and health — had been postponed indefinitely, according to Dwight Cramer, Deputy Director of the Office of Cooperative Science and Technology Programs at the State Department.

Cramer said that for the time being, all

policy-setting meetings — such as those by joint committees — are being called off. Regarding the 300 or so projects administered under the cooperative agreements, which involve some 700 to 800 scientists from each country, Cramer said each would be analyzed separately.

For instance, the President has ruled out both the sale of high-technology products, such as computers, and the transfer of high-technology research until there is a resolution of the political schism brought about by the Soviets' incursion into Afghanistan. As a result, shipment of a magnetohydrodynamics (MHD) channel generator to a Moscow-area research facility, originally scheduled for later this month, also has been postponed.

(The channel generator is the duct work that fits inside an MHD magnet. Ionized gases passing through the channel in the presence of a high magnetic field induce an electric current, which is drawn off by electrodes imbedded in the channel's walls.)

Bob Porter, Energy Department spokesman, said Soviet testing of the channel in their 250-megawatt (thermal) test facility "would have been a benefit" to the U.S. MHD-development program, but "is not essential." Already some six configurations of MHD channels have undergone testing under sustained operation (as opposed to short-pulse operation) at the Soviet U-25 facility. Developed by Westinghouse under a \$10 million contract, the 27.5-foot-long rectangular model that was to have been sent over later this month is a "refinement" of a window-shade configuration that had been tested earlier. And, Porter emphasized, shipment of the new channel is not cancelled, just "postponed indefinitely."

"Low-level routine exchanges may continue," Cramer said, "but they will be looked at one at a time." He added that the administration would be looking especially for those programs where it was perceived the United States had more to gain than the Soviets did by maintaining the exchanges — such as earthquake research — or where humanitarian interests might be served by maintaining cooperation — such as in the health and environmental fields.

During the breach in cooperation, Cramer said, bilateral working groups — those mid-level administrative bodies that might oversee as many as six individual projects or programs — probably will not meet. In contrast, of the projects themselves, such as substantive low-level exchanges of scientists or programs already planned and agreed to, Cramer said, "That type of activity will continue to take place." In particular, he saw little likelihood that cooperative research or exchanges involving basic research would be interrupted.

The current "slowdown" in cooperation, as it is termed, only applies to government-funded and government-directed research. Unaffected are any in-

dependently negotiated programs between private institutions, such as the collaborative venture announced last month between gravity-wave researchers at the California Institute of Technology and Moscow State University. But involving as it does little more than visits between scientists and a sharing of basic-research data, nothing about the venture violates the President's directive either, Cramer volunteered.

Under Kip Thorne, the Caltech group has already collaborated informally for a decade with its Moscow counterpart; Caltech provided the theoretical input, Moscow the experimental devices for detecting gravity waves. But now that the Caltech team is beginning to develop its own experiments for detecting gravity waves, the institutions decided to initiate a more formal cooperative pact.

(Gravity waves emanate from extremely violent events in space, such as the birth of black holes, collisions between black holes, and the explosion of supernovae. Detection of gravity waves would give scientists a way to view such phenomena, many of which are invisible to optical and radio telescopes.)

Had the Caltech negotiations involved research on MHD instead of gravity waves would the administration seek voluntary compliance with the President's directive from a private institution? Perhaps, officials say, but "not yet, the policy's still too new." □

'Test-tube' clinic approved

The *in vitro* fertilization clinic of the Eastern Virginia Medical School in Norfolk was given final approval this week by the Virginia health authorities. This would be the United States' first clinic for the conception of human embryos outside the mother's body.

So far nearly 25,000 childless couples have contacted the medical school in hopes of using *in vitro* fertilization to reproduce. Mason C. Andrews, chairman of obstetrics at the medical school, says that the clinic would only accept couples who "have no reasonable alternative of achieving pregnancy." The *in vitro* program, Andrews added, would also be under the strict control of several medical ethics committees.

Andrews anticipates that the clinic would be able to treat 50 women the first year. When the clinic officially opens, or whether it actually opens, however, remains in question because the Tidewater chapter of the Virginia Society for Human Life plans to go to court to delay or prevent the opening of the clinic. Charles D. Dean Jr., president of the chapter, said his society's lawyers would be in "both federal and state courts" this week to challenge state approval of the clinic on the grounds that the authorities failed to meet legal guidelines. □