

Space cooperation: A growing issue

There are four central matters in the question of U.S.-Soviet cooperation in space, says Nancy Lubin of the congressional Office of Technology Assessment (OTA): science, foreign policy, national security and questions of Soviet motivation and behavior. Lubin, director of a just-published OTA report on "International Cooperation and Competition in Civilian Space Activities," was one of several witnesses appearing this week before the House Subcommittee on Space Science and Applications to address the increasingly controversial problem.

In 1982, President Reagan allowed a 10-year-old U.S.-Soviet pact on peaceful cooperation in space to lapse (SN: 3/27/82, p. 214). Its lack has prevented any official, government-to-government scientific exchange programs between the two superpowers, and since the lapse, a number of U.S. space researchers have spoken out in favor of renewing the agreement. Last year, a joint congressional resolution by Sen. Spark M. Matsunaga (D-Hawaii), urging renewal, was passed unanimously by both houses (SN: 11/10/84, p. 295), and Reagan even signed it. But the diplomatically phrased bill asked him only to "endeavor" to renew it, "at the earliest practicable date." The scientists remain frustrated, even though some of them are participating — under unofficial arrangements set up among individuals — in the Soviet Vega missions to Comet Halley.

But science, OTA's analysis seems to suggest, is the easy part. According to Lubin's prepared remarks for the committee, in fact, the prevailing view of U.S.-Soviet cooperation in many areas of space research (notably planetary science and life sciences) is "an unequivocal 'yes.'"

Foreign policy, however, embodying such factors as U.S. responses to Soviet actions in Afghanistan and Poland, is a more complex picture, even, as Lubin notes, when it is argued that space cooperation may reduce tensions between the superpowers. "Past experience," she says, "suggests that while foreign policy does affect the direction of U.S.-Soviet space cooperation, the reverse does not necessarily follow. Space cooperation may be one means of keeping lines of communication open with the USSR, and *sustaining* good relations. But there is no evidence that it can, in its own right, *redirect* or *reshape* that relationship in any far-reaching or significant way."

She cites the manned Apollo-Soyuz Test Project mission (ASTP), conducted in 1975, as one that took place in an era that also saw "the beginning of the Soviets' second phase of testing of their ASAT weapons, the development of Soviet ROR-SATs (nuclear reactor-powered ocean reconnaissance satellites) and a great deal

of importance placed on military space systems in both countries." In short, she says, "in purely political terms, the ASTP was soon followed by a sharp deterioration in U.S.-Soviet relations overall."

One oft-cited objection to space cooperation is "technology transfer," with high-tech U.S. developments finding their way to the other side through scientific projects. On the other hand, Lubin notes, "since the Soviets are already cooperating with other Western countries in space research and applications, the U.S. could find it increasingly difficult to control the flow of information to the USSR without isolating itself from the rest of the world space community."

Some U.S. space scientists take an even stronger view. "Technology transfer is a non-issue," says John A. Simpson of the University of Chicago. Simpson, who has flown some 30 space experiments since 1958, has also provided a newly developed type of dust-detection instrument for the Soviet Halley spacecraft (as well as serving as a co-investigator on the project). "I solved the problem of technology transfer to the satisfaction of all concerned," he told the House committee, "by designing

the experiment using only components and designs which could be obtained readily — not only in the open market in the U.S. as 'old tech,' but also in England, West Germany and Japan."

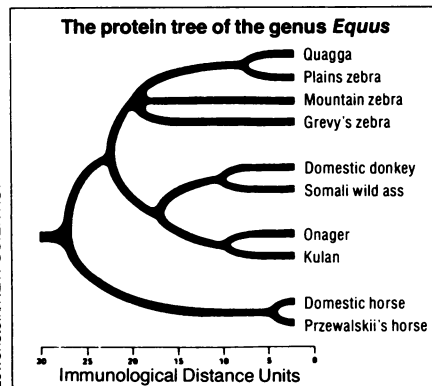
Besides cooperation, U.S. participation also represents the availability of the resulting data, and U.S. scientists sharing data from the two superpowers' past Venus spacecraft have gone out of their way in talking with reporters to make sure that the Soviets get their share of the credit. But, says Lubin, "despite publicity in the U.S. surrounding American experiments on board the Venus Halley mission, the Soviet press has either avoided mentioning or explicitly *denied* that there is any U.S. participation in this mission."

Even larger cooperative programs have been suggested, however, such as a multi-billion-dollar manned mission to Mars. Matsunaga, meanwhile, has offered a joint congressional resolution advocating an "International Space Year," from 1992 to 1995. In the touchy political climate, however, his bill only urges the President to "consider the possibility of discussing" the idea with foreign leaders — including the Soviet Union's. — J. Eberhart

Telling a quagga by its stripes

If, in a mix-up at a costume shop, a couple were issued the front half of a zebra suit and the back half of a horse, it could be considered a quagga disguise. But if the masqueraders were pressed as to whether they were more horse or more zebra, the latest biochemical research advises them to insist on zebra.

The quagga, a South African animal extinct for more than 100 years, has been a source of confusion among taxonomists. Some contend, on the basis of the quagga skins preserved in museums, that this front-striped animal is a zebra, either a fourth zebra species or a variant of the Plains zebra, whose hindquarter stripes are dim. But others have argued that the quagga's teeth and skeleton indicate that its nearest relative is the true horse.



Biochemists joined the fray last year when muscle tissue was obtained from a salt-preserved quagga pelt in a West German museum. The tissue yielded both pro-

teins and genes that could be analyzed (SN: 6/9/84, p. 356).

Now the analysis has yielded some results. According to "remarkably concordant" findings on the proteins and on the genes, the quagga was a subspecies of the Plains zebra, says Jerold M. Lowenstein of the University of California at San Francisco. He looked at the binding between a sample of quagga proteins and mixtures of antibodies that bind to blood-serum proteins of each of the extant *Equus* species. The quagga sample bound more of the antibodies against Plains zebra serum than against the other species. Lowenstein calculates that the quagga relationship with the Plains zebra is six times closer than its relationship with the two other zebra species.

"We had to use special techniques to show the difference," Lowenstein told SCIENCE NEWS. "There is 99 percent identity on the protein level. All the [*Equus*] species diverged within the past 5 million years, which is only yesterday in evolutionary terms."

The quagga-Plains zebra relationship is further supported by the analysis of quagga mitochondrial genes performed by Russell Higuchi and Allan Wilson at the University of California at Berkeley. They find seven times as great a difference between quagga and Mountain zebra DNA as they do between quagga and Plains zebra DNA.

"Stripes, the molecules tell us, do make a zebra," Lowenstein concludes in the July 18 NEW SCIENTIST, "and the half-striped quagga was a Plains zebra." — J.A. Miller