AEC regulations. Within 3 days milk samples taken at Yuma, Arizona—about 10 miles from the Mexican border—showed a sharp rise in iodine-131, a telltale sign of fresh fission products.

There, practically within sight of the international line, the published data stop. An old joke among the cognoscenti holds that radioactive clouds "couldn't get through customs." Actually, of course, that's where the surveillance stopped.

The second prime candidate for a treaty violation was the "Schooner" shot, a 35-kiloton Plowshare blast on 8 December 1968. Schooner ripped a crater in the Nevada desert 200 feet deep and 850 feet across. Within 24 hours tracking planes over Nevada and Boise, Idaho, were picking up levels of radioactivity comparable to those last seen in 1962, the year that atmospheric testing ended in Nevada. The explosion sprinkled small but measurable amounts of radioactive tungsten north to Washington, South to Indio, California, near Palm Springs, and east to Joplin, Missouri, and Monroe, Louisiana.

Similarly, the 4.3 kiloton "Palanquin" cratering shot of 14 April 1965 caused a noticeable rise in radioactive iodine in milk as far north as central Montana and possibly, though not certainly, in southern Canada as well.

It could not be determined whether the Soviet Union had inquired about these possible violations. Canadian officials contacted by *Science* said that while one U.S. venting in the late 1960's had caused a "very small but significant" rise in radioactivity in Canadian territory, they could not recall the date or name of the test.

In any case, AEC officials say that improvements in testing procedures in recent years have enabled them largely to eliminate accidental ventings. Test shot holes are drilled deeper; more and better doors and safety devices are provided on access tunnels to explosion chambers. "We're keeping just about every atom in the ground now," says one AEC source. "I don't think the Russians are doing that well."

The lesson seems to be that treaties phrased in absolute terms are not always observed absolutely. But short of pulling out of a hard-won agreement altogether, there isn't much the complaining side can do about it.

—ROBERT GILLETTE

Advising the Congress: OTA Council Faces Shakedown Problems

A dispute has flared up on Capitol Hill between the fledgling Office of Technology Assessment (OTA) and the council of outside experts which was created by law to give scientific advice to the congressional technology assessment effort*. The main issue is the role the council should play in advising the OTA permanent staff and in influencing the development of OTA projects.

The conflict has surfaced in the public meetings of the scientific council, where, as the transcripts of them have shown, council members have openly criticized OTA Director Emilio Q. Daddario and his office's handling of early projects. One cause of the friction is that the council is an unusually high powered group which, in the 7 months of its existence, has opted to be very vocal and active. As is apparent from the transcripts, two of the more concerned members of the council are its chairman, Harold Brown, president of the California Institute of Technology and former Secretary of the Air Force, and Jerome B. Wiesner, president of the Massachusetts Institute of Technology.

The OTA was set up under a 1972 law to provide Congress with an early warning system on emerging, technically related, national problems; but because of funding delays, OTA has only recently completed its first half year of activities. The legislation setting up OTA makes the OTA director and staff responsible to a board of directors comprised of members of the House and Senate whose chairman is Senator Edward M. Kennedy (D–Mass.). To assure technical oversight and public input, however, the law also provides for a council—formally known as the Technology Assessment Advisory Council. The law says that the council shall furnish advice and recommendations "upon request by the Board."

Harold Brown

But the law says nothing about what relationship should exist between the council and the OTA director and staff, an omission which has set the scene for the skirmishes over the council's role.

Council members generally claim they are investing more time and energy on the council than they have on other science advisory committees. Many, too, seem committed to the idea that the council's success is dependent on the success of OTA. Chairman Brown told *Science*, "If this thing falls on its face we are going to fall with it. . . . I had some very serious questions about it [OTA] right from the beginning and I still have them, although I see some hopeful signs. It is by no means a foregone conclusion that this is going to succeed."

At least some members of the congressional board know that the council is unhappy. Brown and Wiesner, for example, both say they have talked

* Council members are: Harold Brown, president, California Institute of Technology; J. Fred Bucy, Texas Instruments, Inc.; Hazel Henderson, author, Princeton, N.J.; J. M. Leathers, Dow Chemical Corp.; John McAlister, Jr., Stanford University; Eugene P. Odum, University of Georgia; Frederick C. Robbins, Case Western Reserve University School of Medicine; Jerome B. Wiesner, Massachusetts Institute of Technology; Edward Wenk, Jr., University of Washington; Gilbert F. White, University of Colorado. Ex officio members are Lester S. Jayson, Library of Congress, and Elmer B. Staats, Comptroller General.

privately with Kennedy about the problem. But the board has given no public sign that there is some trouble. In regular meetings with the council, board members have urged the council to be as independent and objective as it can. On 27 June, Kennedy wrote a polite, general letter to Brown urging the council to look into the areas of growth policy, materials, technology and trade, and chemicals and health. But the board as a group appears to have kept clear of the problem.

As for Daddario, he acknowledges that there have been some difficulties with the council, but attributes these to the council's "catching up" to the activities begun by OTA, which early this year was itself catching up to the "rhythm and flow" of congressional activities. Daddario acknowledges that, when OTA got started earlier this year, it did a less than perfect job of keeping council members informed. Both Daddario and many council members say that the feeling that the council was being ignored peaked during a May meeting when Wiesner accused Daddario of "bypassing" the council and sputtered, "It means you don't give a damn about what we think." A subsequent meeting in July was less acrimonious, and, although Daddario claims it was more constructive than the May meeting, some council members nonetheless said afterward that the dispute about the powers of the council remained unresolved. "What's still up in the air is whether the council has a sort of operational role," Hazel Henderson, a New Jersey–based author on the council told *Science*. "This is still a very honest question."

Specifically, the council has been concerned that its advice hasn't been sought, or heeded, on a range of issues. Among them was OTA's proposed $5 million fiscal 1975 budget, which some members say they hardly got a chance to study before it was presented by Daddario to the House, which cut it to $3.5 million. The council tried to get OTA to make its proposals more specific and testified to the Senate on OTA's behalf; nonetheless the Senate also cut the proposal to $4 million, noting in a report that the plans were unclear. The council has also tried to influence the staffing of OTA to encourage the use of more senior, technical experts—in part because some members have said that neither the top management of OTA nor the relatively young staff have the needed scientific skills. Henderson has been trying to get Daddario to appoint a permanent officer in charge of getting public interest, labor, consumer, and environmental groups represented in OTA studies, but this is still in the planning stage.

Finally, and most important, the council's advice has not been followed routinely on specific assessments, members say. In meetings some have expressed dismay with the various proposed agriculture and oceans assessments, for example; but the warnings have not been always heeded. During the May meeting, Gilbert White of the University of Colorado summarized: "My impression of the Council is that it has been peripheral."

Privately, some council members attribute the problems they say they have had to Daddario's management. "Daddario is acting like a man who is jealous of his authority," said one.

Other council members point out, however, that if the group were to carry through and be, as Henderson said, "operational," it would have to

OTA Work in Progress

Since it opened its doors for business in January of this year, the Office of Technology Assessment (OTA) has launched a number of major projects intended to give guidance on technical issues to Congress.

The OTA works by gathering requests for studies from members of its congressional board of directors and from committees of the House and Senate. The staff then correlates similar requests, judges their relative importance, and makes suggestions for assessments to the board. It also consults the board's Technology Assessment Advisory Council, a high-level science advisory group (see page 510). Through these discussions and the use of consultants or special outside panels, the assessment proposals are finalized. They are usually then let out for competitive bid by outside firms, although some studies will be done by specially constituted committees and some will be done in-house.

On 12 July, OTA presented the report of its first study, which was on *drug bioequivalence*, or whether drugs having only generic labels act identically to those sold with brand names, a proposition which has been the basis of recent Administration cost-cutting proposals (*Science*, 25 January 1974). The report was done by a committee of experts with Family Health Care, Inc., of Washington, D.C., as the contractor to OTA.

OTA has awarded a contract for assessing *solar energy* for future onsite electric power generation—to help Congress decide whether to launch a major solar energy program for the next decade. The $311,000 contract was awarded to Midwest Research Institute, with four subcontractors; Honeywell, the University of Pennsylvania, Black & Veatch, and Spectrolab of Texton, Inc. Both hardware feasibility and social and economic effects will be studied.

OTA has awarded two contracts for studies in the field of *automated mass transit systems*. One, with Battelle Columbus Laboratories for $218,500, will explore the advantages and operating problems that cities have with existing and planned systems. The other, with Skidmore Owings and Merrill for $232,600, will look at what factors have been important in cities' decisions to build or modernize, or not to build transit systems.

In his first press release concerning its projects, the chairman of OTA's board, Edward M. Kennedy (D–Mass.), called for a special advisory panel on food and technology to be appointed and to report back to OTA in 90 days. Nothing came of this proposal, however; and after several attempts at getting some agriculture assessments started, OTA now plans to make an in-house study of *agricultural information systems*.

Other studies include one, just advertised for competitive bid, of how future *offshore* technologies such as oil drilling, nuclear power plants, and deepwater ports could affect the coastal states of New Jersey and Delaware. Studies under consideration include the effects of chemicals on man, technology and trade, materials policy, and natural growth.—D.S.

act differently. It would have to meet more often (it has already met five times in the past 7 months, and a 2-day meeting is planned for October), organize working subcommittees, take votes, and issue formal recommendations. This would be a departure from the informal, consensus type of procedure Brown has so far preferred. But Henderson noted to *Science* that the council could not do all this without the cooperation of OTA, too.

However it decides to operate, the council will have to recognize, and play ball with, all the other players in the OTA game: the 100 or so other experts who are serving on special panels or individually as consultants, the key congressional committees who have requested assessments from OTA, the board, and Kennedy. Edward Wenk, Jr., of the University of Washington, who has been highly critical of the "almost total exclusion" of the council from OTA decisions, says, "I believe the satisfactory function [of the council] does depend on all three legs of the stool carrying equal weight"—namely, the council, the board, and OTA itself. "There may be some institutional tension between them, but my experience in government is that you need institutional tension to make progress."

At issue then, is whether the OTA council as it rumbles and seethes along in its early stages, can sidestep the trap which other science advisory committees have fallen into, namely, to criticize OTA freely and independently without making Daddario so mad that he shuts the door in its face. Such was the fate, after all, of the President's Science Advisory Committee, which started dishing out more advice—and criticism—than some Presidents cared to hear. How will observers know that the council has given up? "You'll know when we stop coming to all those meetings," said one member.—DEBORAH SHAPLEY

Strip Mining: Congress Moves toward "Tough" Regulation

Over the past few decades the strip mining of coal has blighted hundreds of square miles of landscape, especially in the mountains of Appalachia. Many states have enacted laws for strip mining control and reclamation, but these laws vary greatly in effectiveness and environmentalists continue to regard strip mining as a scourge.

Year after year bills to bring strip mining under federal control or federal regulatory standards have been introduced, but, until the past few sessions of Congress, such measures simply languished. Now, at last, what generally are regarded as "tough" strip mining control bills have been passed by both the Senate and the House, the latter having acted on 25 July after 6 days of debate.

The strip mining legislation has advanced despite the opposition of Nixon Administration officials and coal industry and electric utility lobbyists who have argued that the new controls would severely impede coal production. That such seemingly potent opposition thus far has been unavailing seems to be due to some significant but little noticed changes on Capitol Hill and in the fact that the coal industry is colliding with important political interests in the West as it expands its operations in that region.

Enactment of meaningful federal legislation for the control of strip mining first became a real possibility a few years ago with the rising interest of the public and Congress in environmental issues generally. In early 1972 a small, modestly funded group called the Environmental Policy Center (EPC) was established in Washington, and one of its staff members, Louise Dunlap, then 26, was to lead the lobbying for strip mining legislation.

The anti–strip mining lobbyists got a break in 1972 when the then chairman of the House Interior Committee, Representative Wayne Aspinall of Colorado, was defeated in a Democratic primary by a candidate strongly supported by environmentalists. A powerful legislator with close ties to mining and other resource-user interests, Aspinall had generally kept his subcommittee chairman on a short tether and made the going hard for any members pushing bills which he opposed. His departure was to make it easier this year for Representative Morris Udall (D–Ariz.) and Representative Patsy Mink (D–Hawaii), chairmen of the environment and mining subcommittees, respectively, to advance HR 11500, the strip mining bill over which they jointly exercised jurisdiction.

The Senate passed its strip mining control bill in early October 1973, just before the Middle East war and the Arab oil boycott brought on the energy crisis. The onset of that crisis and the proclamation of Project Independence as a national goal were expected by many observers to play into the hands of those opposing stringent strip mining legislation in the House. Much the greater part of the nation's enormous coal reserves (and especially its reserves of high-energy coal) are accessible only to underground mining. But the thick, easily strippable seams of low-sulfur coal lying below shallow overburdens of earth in the western High Plains region do of course represent an important energy resource.

The argument that the production of more low-sulfur coal was all-important and should not be hampered by strip mining controls was hardly persuasive to the ranchers, wheat growers, and others who would be affected by the coal stripping, however. These interests, speaking through such congressmen as John Melcher (D–Mont.), Teno Roncalio (D–Wyo.), and Mark Andrews (R–N.D.), were determined to get the upper hand. The uneducated and essentially leaderless mountain people of Appalachia had long ago lost their birthright to coal companies that had bought up mineral rights for as little as a dollar an acre. But the resourceful ranchers and farmers of the High Plains were damn well going to look after their interests, and with a vengeance.

Although strip mining in the High Plains is in many ways less objectionable than it is in Appalachia, the westerners have had reason to be concerned. Inasmuch as the High Plains is a region of generally modest relief, its near-surface coal deposits are exploited