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

by "open pit" mining methods rather than by the contour stripping method that has left 20,000 miles of unsightly "high wall" in the Appalachian states. Huge tonnages of coal can often be obtained from a single pit occupying a relatively small area. On the other hand, in the absence of strict regulation, such mining can leave the open landscape marred by huge piles of overburden and disrupt groundwater regimes. Where coal seams function as an aquifer—and this is common—stripping can lower the water table over a wide area (*Science*, 2 November 1973).

The protective reaction of the westerners facing the prospect of increasing strip mining was first manifested in the "Mansfield amendment." Before the strip mining legislation cleared the Senate, Mike Mansfield of Montana, the Democratic majority leader, had it amended to forbid the stripping of federally owned coal deposits in cases where the surface is in private ownership. To the coal industry this provision was upsetting because it would effectively ban strip mining of 35 to 40 percent of the strippable coal reserves in the High Plains region.

When the House Interior Committee began work on its strip mining bill, Representative Melcher took a different approach to the problem of protecting the surface owner. His amendment, adopted in committee and later successfully defended on the House floor, says that regardless of who owns the coal deposits, no stripping shall occur without the surface owner's consent.

Industry lobbyists and some of Melcher's colleagues have objected that the coal companies would pay dearly for that consent—that, indeed, the surface owners would become greedy extortionists. But Melcher has cheerfully suggested that the coal companies should be able to get by for as little as $1000 an acre. For their part, the environmental lobbyists much preferred the Melcher amendment to the alternative favored by the Nixon Administration of trying to indemnify the surface owner for damages by making the coal strippers post bond. But their real preference—and one they will press for when the House and Senate bills go to conference—is the Mansfield amendment because of its restrictive effect on strip mining.

In the prolonged floor debate on HR 11500, there were at least four fundamentally different points of view in contention. One was that of Representative Ken Hechler of West Virginia (a maverick within his own state congressional delegation), who wants not to regulate strip mining but to phase it out entirely. Hechler's abolitionist proposal never had any chance of adoption. At the other extreme was the viewpoint of those coal industry interests who frankly wanted no strip mining bill at all. The sponsors of HR 11500 represented the middle way, for while their measure would not abolish strip mining, it would have stripped-areas restored to their "approximate original contour." This is a somewhat loose term that apparently is meant to be applied flexibly enough to allow open pit as well as contour stripping to continue.

Still another point of view was represented by Craig Hosmer (R–Calif.), who offered an alternative bill which he said would stop the worst abuses of strip mining without checking the needed expansion in the production of coal. A signal feature of the Hosmer bill was that it would exempt open pit mining from regulation and permit contour stripping to continue as now practiced. Like Hechler's abolition bill, Hosmer's bill was rejected overwhelmingly.

Ambiguous Support

Hosmer told *Science* that his hopes of winning House acceptance for his measure had depended on gaining the support of the Nixon Administration, the National Coal Association, the National Association of Electric Companies, the American Mining Congress, and the U.S. Chamber of Commerce. But, he indicated, only the latter two organizations were unambiguously behind his bill. Even the Administration's position was confused, with some officials supporting Hosmer, but with Russell E. Train, administrator of the Environmental Protection Agency, supporting HR 11500.

As passed by the House, HR 11500 contains, besides the basic reclamation and surface owner's consent provisions referred to earlier, a number of other key features, including the following:

- The new regulatory regime would be administered by the states except in such cases where a state failed to meet its obligations. The full regime would take effect only after an interim period of up to 36 months during which less stringent regulations would apply. Environmental lobbyists hope to eliminate this interim program from the final bill.
- Stripping operations would be by permit only, and the issuance of a permit would depend upon the stripper's presenting an acceptable plan of reclamation.
- No stripping on "alluvial valley floors" would be allowed. This provision was included at the insistence of westerners who said that such valleys were a mainstay of the High Plains' ranching and farming economy.
- Special safeguards would protect the owners of water rights from any stripping that upsets the hydrologic regime.
- $200 million a year in funds raised from outer continental shelf oil leases would be allocated for the reclamation of "orphan" lands strip-mined in the past and abandoned. An alternative favored by environmentalists and some Appalachian congressmen was a severance tax of $1.50 per ton on strip-mined coal but of only 15 cents per ton on underground-mined coal—a differential calculated to make underground mining more attractive.
- $50 million a year would be authorized for research aimed at improving the technology of underground mining—an authorization possibly much more generous than any sums actually to be appropriated for such a purpose.

Suffice it to say that, unless one shares Hechler's abolitionist belief that the states lack the political fortitude to administer the regulatory program vigorously, the House bill is a measure well designed to check abuses and bring about effective reclamation. On the other hand, it is not a bill that—contrary to the dire public predictions of coal industry spokesmen—is likely to stop strip mining in either the East or West. Reclamation requirements under the Pennsylvania strip mining law are almost the equal of those under HR 11500, yet coal stripping is increasing in that state.

Inasmuch as the Senate-passed bill reflects the same aims and tough-mindedness as HR 11500, the Congress now has an excellent chance to make amends for the federal government's long neglect of the strip mining problem. The Nixon Administration, fearing an adverse impact on coal supplies, has threatened to veto HR 11500 if it clears Congress. But, since the House bill was passed by a vote of 291 to 81 and the Senate bill by a vote of 82 to 8, the strip mining legislation may be veto-proof.—LUTHER J. CARTER