

Canyon Dams: Dissents from Arizona Scientists

For Arizona farming and business interests the Central Arizona Project (CAP) and the one or more revenue-raising Grand Canyon power dams associated with this costly aqueduct system have been goals deserving only praise. But for more than a year things have been going badly for CAP in Congress. Recently, even in Arizona, the canyon dam proposals and, to a lesser extent, CAP itself have been criticized by some members of the state's academic and scientific community.

These first cracks in the moral support at home come when Arizona's hopes of obtaining congressional approval of CAP appear deeply frustrated. Water shortages are expected to develop in the Colorado River basin over the next generation, and the recent legislative efforts to reconcile the water demands of the seven basin states have failed. These efforts have met with strong opposition from two quarters—from conservationists opposed to the canyon dams and from representatives of the Northwest who believe, rightly, that the states of the Colorado basin want to import water from the Columbia River basin and to use canyon dam revenue to help finance the importation (*Science*, 17 June 1966).

A bill generally similar to the Johnson administration's CAP proposal (*Science*, 10 February), which eliminates the canyon dams and does not call for interbasin importation studies, seems likely to be passed by the Senate with the support of Arizona's 2 senators, but its prospects of passage by the House are poor. Wayne Aspinall of Colorado, chairman of the House Interior Committee, can be expected to try to block passage of any CAP bill which doesn't provide for Hualapai dam (formerly called Bridge Canyon dam) and for a formal study of the feasibility of augmenting the Colorado River flow through importation and other means. CAP, he says, would be dipping into the water reserved for Colorado and the other upper-basin states unless the river's total flow is increased. "I like my candy as much as they like theirs," he adds. In an effort to satisfy Aspinall's sweet tooth, five Colorado reclamation projects, priced at more than \$360 million, have been included in the Senate CAP bill. However, this does not meet Aspinall's expressed concern about prospective water shortages.

Though the Arizona Academy of Sciences itself has acted with caution, many of its members have now joined in what seems to be a broadening national consensus that the building of either the Hualapai or Marble Canyon dams might do substantial harm and would serve no necessary purpose. Less than half of the Academy's 639 members answered a questionnaire on the canyon dam issue in February, but, of those who did respond, nearly two-thirds opposed the construction of the dams. A Grand Canyon study committee, relying partly on results of the questionnaire, concluded that no adequate, up-to-date biological or geological survey has been made of those parts of the canyon which would be affected by the dams.

"For this reason," the committee said, "it is not possible to anticipate the ecological and geological consequences of impoundment, much less to know just how

serious would be the damage to the Grand Canyon as a natural laboratory. Pending results of a careful survey . . . we recommend a moratorium on dam construction."

In late April the Academy, under the sway of some of its senior members, rejected the moratorium proposal but recommended that scientific surveys be undertaken prior to any dam construction and that the boundaries of the Grand Canyon National Park be somewhat extended. The leadership, it seems clear, did not want it said that the Academy had taken a position hurtful to CAP. Even so, the net effect of the Academy's questionnaire and recommendations was to suggest that most Arizona scientists were in the same camp as "Arizonans for Water Without Waste," a small ad hoc group of conservationists in Tucson who organized last summer to oppose building of the canyon dams. News of the Academy poll stirred enough interest to prompt the Southern Arizona Branch of the American Society of Civil Engineers to declare its support for the dam construction.

The Central Arizona Project, designed largely to provide water for existing farms in the Phoenix and Tucson areas now dependent on gradually declining groundwater resources, has been accepted by nearly all Arizonans as essential to avoid a water crisis. In March, however, *Arizona Review*, journal of the University of Arizona's College of Business and Public Administration, published an article by Robert A. Young and William E. Martin, associate professors of agricultural economics, who challenged CAP's economic validity.

The authors observed that CAP would never provide enough water to reduce the present overdraft of groundwater by more than one-third. Moreover, they said, even that one-third reduction would be gained "by charging municipalities higher prices for water than they can expect to pay for many years for pump water. Further, the project would bring in water farmers in pump areas could not afford to buy [even at heavily subsidized rates] and farmers in irrigation districts do not particularly need. . . . Such action would have a negative multiplier effect on the overall Arizona economy."

President Richard A. Harvill of the University of Arizona received a number of calls about the Young-Martin article from CAP supporters. According to Harvill, nobody was demanding the authors' heads, but some callers felt that opposing viewpoints should be presented. Harvill, an economist himself and a supporter of CAP, later wrote Arizona's senators to express his enthusiasm for the project. Earlier, the College of Agriculture had issued a report prepared by George Campbell, a U.A. economist with the agricultural extension service, which disputed the Young-Martin analysis. This rebuttal was praised by an editorial in Tucson's *Daily Star*. The *Star* suggested that the Young-Martin article was an "anti-Arizona propaganda paper rather than a scholarly piece of research privileged under the standards of academic freedom."

Arizona sentiment undoubtedly is still overwhelmingly in favor of CAP and a canyon dam. However, from now on the CAP promoters will be sharing the forum with some new voices of dissent.—LUTHER J. CARTER