

tually as it had been, although his bill included a provision requiring trainees to pay back the money they received if they chose not to spend a year in research for every year they were supported. Rogers' bill calls for an expenditure of \$208 million over 2 years. In addition to its training provisions, it contains a clause saying that none of this money may be used to support unethical research in the United States or abroad. An amendment to the bill prohibiting the use of federal funds for research on live fetuses was added on the floor and the bill passed the House.

In June Kennedy introduced two bills in the Senate. One dealt with training but contained provisions that made it substantially different from Rogers' bill. Kennedy emphasizes giving fellowships directly to individual scientists (as does the Administration's program) who would be selected centrally through NIH. Generally speaking, Rogers prefers the old system of giving money to institutions which then decide to whom training grants will go, although his bill does provide for some centrally awarded fellowships. (Under the old program, NIH had funds for both training grants and fellowships.) The Kennedy bill calls for the same amount of money as the Rogers bill—about \$208 million—but Kennedy would spend it in 1 year rather than 2 years. Both Rogers and Kennedy call for a study of the entire training situation by the National Academy of Sciences.

The second Kennedy bill focused on the ethics of human experimentation and called for creation of a national commission that would establish regulations governing medical experimentation and, at the same time, study the ethical implications of advances in research with a view to deciding what those regulations should be. After hearings, the Senate combined the training and ethics bills into one.

[The Senate bill also contains an amendment that would give the NIH peer review system the sanctuary of the law. Under that system, all grant applications are reviewed and ranked by expert scientists who sit on "study sections." Last spring, the biomedical community feared that this peer review structure would be destroyed in the course of an HEW effort to eliminate many of its hundreds of committees (*Science*, 25 May). As things stand now, those study sections were created by a regulation and could be disbanded easily. The amendment, introduced by Gaylord Nelson (D-Wis.), would preclude that possibility. In addition to preserving the present peer review setup, which applies to research grants, the amendment calls for creation of a similar system for review of all research contract applications.]

Rogers, reportedly, was not happy about the Senate's decision to combine the training and ethics bills. He had hoped to get a training bill through Congress but found himself confronted with a bill containing many provisions

that his subcommittee in the House had never considered. So, before the House could agree to go into conference with the Senate on the matter, Rogers held hearings on the ethics provisions late last month. Although there was a general feeling that regulations governing human experimentation are in order—HEW and NIH are already working on new guidelines and some already exist—and that a commission to study the ethical questions raised by scientific advances makes sense, there was no consensus that the two aspects of the issue should be handled by the same group, as Kennedy proposed.

Now that the House has considered the ethics proposals, it is ready to go into conference with the Senate but when that will happen is uncertain, just as there is no guarantee of what provisions a final bill will contain. A number of scientists are hoping for a bill that contains training provisions and calls for a commission to study ethical questions, leaving the regulatory provisions out. But even if that happens, the bill will still have to get the presidential seal of approval. Some observers say that by attaching an ethics provision to the training grant legislation, Congress will make it very hard for the President to veto the bill. But if it contains a \$208 million figure for training—\$178 million more than he wants—it is difficult to imagine that Nixon will be deterred from a veto just because he would be vetoing a study commission in the process.

—BARBARA J. CULLITON

## Water Projects: How to Erase the "Pork Barrel" Image?

For years water resource projects such as flood control dams and barge canals have been widely thought of in terms of the pork barrel, with the benefit-cost analysis used to justify those projects often regarded as something of a confidence game. And, in truth, while many useful and well-justified projects have been built, questionable ones have been both numerous and conspicuous enough to account for the cynical view which many citizens take

of water resource development decisions. Now, the U.S. Water Resources Council (WRC) has promulgated—in the *Federal Register* of 10 September—a new set of "Principles and Standards" that aim at reform of water project planning and evaluation.

The preparation of such principles and standards was one of the major aims Congress had in mind when the WRC, an interagency body made up chiefly of the heads of departments

responsible for water resources development, was established under the Water Resources Planning Act of 1965. Some 8 years in coming, the new guidelines are here at last, and, having received the explicit approval of President Nixon himself, they are scheduled to take effect 25 October.

Congress, however, has ever been ambivalent toward reform in the evaluation of public works proposals. And, for a fact, the public works committees of the House and Senate want no reform that cuts drastically into new starts in project construction, as application of the new Principles and Standards might do. Accordingly, these committees hope to set aside some if not all of the provisions of this document, but without much chance of success given the President's power of veto. But the conflict over the Principles

and Standards is more than simply a matter of Executive Branch officials pushing through reforms over the protests of recalcitrants in Congress who are defending the pork barrel. Indeed, the Principles and Standards are not beyond criticism, and, even if they were, important institutional changes might be necessary before the public can be more confident that water projects will be evaluated on their merits. This last point will be returned to later.

Under certain key provisions of the Principles and Standards, large-scale, capital-intensive water projects will often be harder to justify in the future than they have been in the past. Furthermore, besides affecting future projects that have not yet been formulated and sent to Congress, the new guidelines will be applied "selectively" to the \$15-billion backlog of projects previously authorized but not yet built. Any authorized project that is reevaluated and substantially reformulated will be submitted to Congress for reauthorization.

In light of the foregoing, the Principles and Standards are looked upon by environmentalists as a major improvement over the guidelines followed in the past. Officials in the Office of Management and Budget (OMB), struggling to hold down spending and the federal deficit, also are pleased. In fact, these officials, who already over the past several years have succeeded in greatly reducing new starts in water project construction, had a large influence on how the Principles and Standards came out.

The three major project construction agencies—the Corps of Engineers, the Bureau of Reclamation, and the Soil Conservation Service—certainly would have adopted a more liberal policy if left to their own predilections. According to Jim Casey, now on the staff of the House Interior Committee but formerly deputy chief of planning for the Bureau of Reclamation, "the WRC is a dummy organization for taking the adverse publicity caused by OMB's dirty work." Although Casey has resorted to a caricature, it is one to which many people in Congress and the project construction agencies sympathetically respond.

Clearly, water resource development interests, together with their friends in Congress, are outraged at the new Principles and Standards. They feel just as aggrieved as the environmentalists used to when the rules were more favorable to costly projects such as

the reclamation dam and reservoir that might fill up a scenic canyon almost to the brim or the navigation project that might turn a small, meandering wild river into a huge, lifeless ditch.

The major issues in dispute with respect to the Principles and Standards involve the discount rate and project planning objectives.

#### The "Discount Rate"

By applying a discount rate—the water resource economist's discount rate concept is entirely different from the one used by the Federal Reserve Board—future benefits from a project can be expressed in terms of present values. This is necessary because the dollar to be received some years hence in deferred benefits is worth less than the dollar received today which, if reinvested, may begin right away to yield a further return. If a dollar in benefits to be received 50 years from now is "discounted" at 3 percent, that dollar is worth only 23 cents today; if discounted at 10 percent, it is worth slightly less than 1 cent.

Typically, the large, multipurpose water project that requires a heavy capital investment in its early years will not yield its greatest benefits until its later years. The benefit-cost (B-C) ratio of such a project is therefore extraordinarily sensitive to a rise in the discount rate. A survey made some time ago by the Water Resources Congress, a promotional group, showed that, for about one-third of some 245 authorized Corps of Engineers projects on which no work had been started, the B-C ratio would drop below "unity" (\$1 in benefits for every dollar in costs) if the discount rate were raised from 5½ percent to 7 percent, the latter being only slightly higher than the initial rate under the new Principles and Standards.

It is not appropriate here to plunge into the depths of discount rate history and theory. It is enough to say that the low discount rates of some years ago were based on the low interest rates once paid on long-term government bonds; that the somewhat higher discount rates applied more recently reflected the rising bond market; and that the still higher discount rates to be applied now reflect, to a considerable degree, the rate of return possible from private investments or, to use the jargon of the economist, "the opportunity cost of capital."

As recently as 5 years ago the discount rate was 3¼ percent. Now it

is 5½. Under the Principles and Standards, it will start at 6½, then rise or fall by ½ of 1 percent each year, depending on the money market. Inasmuch as a discount rate based solely on the opportunity cost of capital would be about 10 percent, the new rate, like previous rates, reflects a degree of subsidy, but now the subsidy is much less than before.

Environmentalists and many economists have argued that the discount rate should reflect no subsidy whatever, but this view does not go unchallenged. The report earlier this year of the National Water Commission (NWC), a special study group whose view of how projects have been evaluated was by no means uncritical, defended the more moderate discount rates based on the long-term cost of government borrowing. The commission said in part:

At the present time, economists are not in agreement that the opportunity cost of capital in the private sector is a valid or relevant concept for federal investment in the public sector. Some believe that individual private decisions tend to be persistently and systematically biased in favor of present or near-term considerations and against long-term prospects; that in the aggregate, individuals in their private decisions concern themselves excessively with today and inadequately with tomorrow; that as individuals with finite life spans they do not plan sufficiently for future generations. As a result, it is argued, in the division of national income current consumption is greater than it should be and savings are correspondingly less. This reduced level of capital formation which stems from inadequate concern for futurity results in relatively high interest rates. . . . Public enterprise is uniquely qualified to place long-term benefits in perspective. The argument against use of a high discount rate based on the opportunity cost of capital in the private sector holds that public investment should be a countervailing force to offset the private bias against the long-term future. . . .

More concretely and specifically, Howard L. Cook, deputy director of the NWC and formerly chief of the Corps of Engineers' policy and legislative branch, says that some regions such as the Ohio River valley will need large multipurpose projects to protect themselves from severe water shortages. Yet, he adds, a high discount rate will probably make projects of this kind impossible. Some economists, notably John V. Krutilla and Anthony C. Fisher of Resources for the Future (RFF), would regard the foregoing as simplistic. In their opin-

ion, the relatively high discount rates associated with the opportunity-cost-of-capital concept would work against a project needed to meet future water needs only if there is a failure to take account of the rising value of water under conditions of scarcity.

### Project Planning Objectives

The planning and evaluation of water resource projects has ostensibly been dominated by the objective of increasing national economic efficiency, however much benefit-cost analysis has in practice lent itself to hocus-pocus and manipulation. For some time now there appears to have been widespread agreement that planning objectives should be expanded, but just what goals should be allowed to shape project plans and weigh in project evaluation has been much disputed. For the most part, the new Principles and Standards reflect a conservative approach, with the advocates of a much enlarged water resource development program again coming out the losers.

Benefits reflected in the B-C ratio—whether related to flood control, irrigation, navigation, recreation, or whatever—have purportedly represented a tangible, calculable economic gain from the standpoint of the entire nation. It has been the policy, at least in principle, not to count purely “regional” benefits.

An example of such benefits would be those from a navigation or a reclamation project that serves chiefly to divert cargo traffic or certain farming activities from one region to another without producing an overall national economic gain. Similarly, a multipurpose reservoir that simply draws boaters and fishermen away from other, equally convenient reservoirs and lakes affording comparable opportunity for water sports could not be said to offer recreation of national benefit. Moreover, most economists seem to agree that, if the goal is to lift up the economy of a poor area, this purpose generally can be better served by some means other than constructing a water project that cannot meet the test of national economic efficiency.

But, as one knows, a number of big, expensive projects would not have been built except for the persistence and political leverage of their sponsors in Congress and elsewhere. One classic case in point was the \$1.2-billion Arkansas River navigation project which, despite a negative B-C ratio, was pushed through by the late Senator Robert

Kerr of Oklahoma, chairman of the Senate Public Works Committee.

Another has been the Cross-Florida Barge Canal, an old dog of a project (first authorized early during World War II as a response to the German U-boat menace) which suddenly sprang to life in 1960 as a result of a presidential campaign commitment made by John F. Kennedy. This latter project's positive B-C ratio has depended on a low discount rate (initially 2.625 percent) and on several questionable assessments of costs and benefits.

For instance, the project would have come out a loser if recreational benefits associated with its two shallow reservoirs were not counted—yet within a radius of 85 miles of the reservoir sites there are 875 lakes, some of them quite large. Furthermore, while what the canal project would add to the region's superabundant water-based recreation assets would be trifling, the project would destroy a rare and important wilderness asset, the beautiful Oklawaha River and its mile-wide hydric hammock swamp forest. So rank and gamy was this controversial project that, in early 1971, President Nixon ordered it terminated even though it was already about a third completed and more than \$70 million in federal, state, and local funds had been spent on it.

### Rough-Cut Political Judgments

Some of the western reclamation projects that have opened up arid lands to farming and settlement probably could not have been justified in terms of “national benefits,” as that term has been defined. Indeed, even the Salt River Project, without which the development of modern Phoenix might have been impossible, possibly could not have been justified as of national benefit when first authorized by Congress in 1903. No one would deny that Congress has approved some highly worthwhile projects by simply exercising a rough-cut political judgment as to the needs, desires, potentialities, and political weight of particular regions.

In 1969, a WRC task force, believing that the national economic efficiency criterion should no longer be even formally regarded as overriding, recommended the addition of three other project-planning objectives: the enhancement of environmental quality, the improvement of social well-being, and the strengthening of regional development. Afterward, the WRC came up with a more limited proposal of its own, held a series of hearings on

that proposal, then this past July made its final decision, concurred in by OMB and the President.

The only planning objective besides increasing national economic efficiency sanctioned by the WRC is that of enhancing environmental quality. With the addition of this latter objective, a project for which costs exceed benefits can be recommended for construction if the deficiency results from a planning decision to forego certain benefits, or to incur certain extra costs, for the sake of a better environment. Also, the WRC decreed that, “where appropriate” for purposes of project evaluation (but not planning), four separate “accounts” will be displayed, with accounts for regional development and social welfare as well as for national economic efficiency and environmental quality. The display of the social welfare and regional development accounts could help establish priorities among projects that meet the test of the two planning objectives.

In the face of the Principles and Standards, water resource development interests now seem to be fearing the worst. In a recent newsletter, the National Waterways Conference, Inc., sized up the problem this way:

What will be the impact of the new criteria? No one knows for sure. . . . The new guidelines, including the stiff 6½ percent discount rate, will be applied retroactively to pending projects “on a selective basis.” Thus, water resource projects could be openly subjected to political whims.

Review, or re-evaluation, would come on a project by project basis—even to the extent of reanalyzing “separable and independent elements” of multipurpose projects. Most Washington observers believe that the review will be used to the extent necessary to justify a decision already made. Thus, the review could be a “quickie” lasting only three months or so and merely updating and recomputing previously obtained data. Or, a review could mean starting all over from scratch and re-formulating the entire project—a process which could take at least three or four years. . . .

The clear note of cynicism heard in the foregoing is not unlike that sounded in the past by environmentalists concerned about the irreversible loss of natural assets from overdevelopment of water resources. Indeed, it appears that the way to build confidence in the integrity of the project planning and evaluation process is not simply through applying guidelines, either the ones just adopted by the WRC or others that might be adjudged less arbitrary.

(Continued on page 316)







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## NEWS AND COMMENT

(Continued from page 269)

What could be more helpful would be to have projects planned according to all relevant values and goals, but with their final evaluation to be made by a high-level board of review free to render its judgments independently of the construction agencies and the OMB. Recommendations to that effect were made in 1949 and 1955 by the first and second Hoover commissions on executive reorganization and, again this year, by the NWC.

The reasons why such a review board is needed, the NWC has indicated, are (i) that the project evaluations of the construction agencies tend to be colored by bureaucratic self-interest; (ii) that neither the OMB nor the Congress has the staff necessary to review the agency evaluations with the thoroughness required; and (iii) that the OMB is not in any case unbiased in its reviews, because of its overriding commitment to carrying out the President's budgetary policies.

In the judgment of the NWC, the review board should be structured as an independent agency, "nominally within the executive branch but insulated from presidential politics by appointments which extend beyond the term of the President." The chairman of the board, the NWC has suggested, should also be chairman of the Water Resources Council, the latter no longer to be headed by the Secretary of the Interior, as at present. The WRC has, to date, been notably weak in its review of the policies and programs of the construction agencies.

If the Nixon Administration should succeed in the difficult task of persuading Congress to establish its proposed Department of Energy and Natural Resources (DENR), the WRC will be abolished and the project construction agencies will all be placed in the new department (in the case of the Corps of Engineers, only part of its planning staff would be transferred to DENR). Under these circumstances, however, the establishment of an independent review board could be more important than ever, for a counterweight to this big new bureaucratic conglomerate could be vitally needed.

As an adviser to the President and the Congress, the review board could function in two ways. One would be to point up broad policy issues, such as how water resource policy may affect the production of food and energy or

how it would relate to a strategy for redirecting patterns of national growth. The other would be to scrutinize water resource development in individual regions, watersheds, and projects, assaying the need for a particular project in the light of all available alternatives, the degree of citizen participation in plan formulation, the protection of environmental values, and the honesty of cost and benefit projections.

To keep its staff from ballooning to excessive size, the review board could (as the NWC suggests) rely on the construction agencies to provide most of the data needed for its review. Such information would not in every case be sufficient, but, as RFF's John Krutilla observes, "If you really made some internal checks for consistency, for plausibility, for reasonableness, project benefits would often be significantly deflated." In addition, the review board would be able to obtain much information from the comments made by entities such as the Environment Protection Agency (EPA), the U.S. Fish and Wildlife Service, and the private environmental groups on the environmental impact statements prepared by the project construction agencies, as required by the National Environmental Policy Act (NEPA).

NEPA itself has contributed remarkably to opening up the process of water project evaluation—this being most strikingly demonstrated in an opinion early this year by Judge Carl O. Bue, Jr., of the U.S. District Court in Houston. Judge Bue pronounced the benefit-cost analysis made by the Corps of Engineers for the Wallisville Dam-Trinity River navigation project to be grossly defective, particularly in that environmental benefits were claimed but environmental "costs" were not. A review board of the kind proposed by the NWC could, to the extent that the White House was willing to act on its advice, actually serve as an arbiter in water project controversies. The arbiter's role is not one that the courts have been able to assume because NEPA does not go much beyond demanding full disclosure.

In sum, a competent review board, assisted by NEPA and the natural adversary relationship that exists between agencies such as the Corp of Engineers and the EPA, may be able to do far more than even the best thought-out Principles and Standards in erasing water resource development's pork barrel image.—LUTHER J. CARTER